Draft

Rate of return guidelines

Explanatory Statement

July 2018

AUSTRALIAN ENERGY REGULATOR

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Note

This explanatory statement forms part of the AER's draft decision on the rate of return guidelines. It should be read in conjunction with our draft rate of return guidelines.

Request for submissions

The Australian Energy Regulator (AER) invites interested parties to make submissions on this draft decision by **5pm AEST Friday 14 September 2018**.

We prefer that all submissions are in Microsoft Word or another text readable document format. Submissions on our issues paper should be sent to: rateofreturn@aer.gov.au.

Alternatively, submissions can be sent to:

Mr Warwick Anderson

General Manager

Australian Energy Regulator

GPO Box 520 Melbourne Vic 3001

We prefer that all submissions be publicly available to facilitate an informed and transparent consultative process. Submissions will be treated as public documents unless otherwise requested. Parties wishing to submit confidential information should:

- clearly identify the information that is the subject of the confidentiality claim
- provide a non-confidential version of the submission in a form suitable for publication.

We will place all non-confidential submissions on our website. For further information regarding our use and disclosure of information provided to us, see the ACCC/AER Information Policy (October 2008), which is available on our website.

Please direct enquires about this paper, or about lodging submissions to rateofreturn@aer.gov.au.

Short contents

Long contents

Shortened forms

Shortened form	Extended form
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
AER	Australian Energy Regulator
ARORO	allowed rate of return objective
ASX	Australian Securities Exchange
ATO	Australian Taxation Office
CAPM	capital asset pricing model
CCP	Consumer Challenge Panel
CCP16	Sub-panel 16 of the CCP. This sub-panel was established to provide advice on our review of the rate of return Guidelines.
CGS	Commonwealth Government securities
CoAG	council of Australian governments
CRG	consumer reference group
DGM	dividend growth model
DRP	debt risk premium
EICSI	energy infrastructure credit spreads index This is the index developed in: Chairmont, *Aggregation of return on debt data report*, 28 April 2018.
ERP	equity risk premium
FAB	ATO franking account balance
GDP	gross domestic product
HER	historical excess returns
IRG	investor reference group
LAD	least absolute deviation
legislative objectives	collectively the NEO, NGO, ARORO, and RPPs
MRP	market risk premium
MSE	mean squared error
NEL	national electricity law
NEO	national electricity objective

Shortened form	Extended form
NER	national electricity rules
NGL	national gas law
NGO	national gas objective
NGR	national gas rules
OLS	ordinary least squares
RAB	regulatory asset base
Regulated services	refers to an electricity prescribed transmission service, an electricity distribution direct control service, and/or a gas reference service
Regulatory period	refers to a regulatory control period and/or an access arrangement period
Regulatory year	refers to a year within a regulatory period
RPPs	revenue and pricing principles
RRG	retailer reference group
Service provider	refers to an electricity transmission network service provider, an electricity distribution network service provider, and/or a gas service provider
SLCAPM	Sharpe-Lintner CAPM
WACC	weighted average cost of capital

How this explanatory statement is organised

This explanatory statement is composed of:

- an Overview, and
- a series of subject matter chapters.

The Overview provides a high level perspective on our draft decision concerning the Guideline review. It contains 5 sections:

- Introduction
- The draft decision summarised
- Objectives and principles guiding our decision.
- A summary of the consultation process and key comments of stakeholders
- Our key reasons in support of our draft decision.

We have set out our full analysis of all the relevant issues in much greater detail in separate subject matter chapters.

Each of the chapters contain a detailed explanation of our analysis and reasons for our draft decision. They also outline the submissions we have received and our considerations of them. The chapters set out the estimation methods, financial models, market data and other relevant evidence that we have taken into account in reaching our draft decision. The chapters also discuss any interrelationships between the financial parameters that are used (or to be used) in the making and implementation of our decisions. Where there are differences between this draft decision and the 2013 Guidelines we explain the reasons for those differences.

The subject matter of each of the chapters is described below:

- Chapter 1 contains the Overview of our decision.
- Chapter 2 discusses the concepts of efficiency, risk and return. These are key concepts within the national electricity and gas objectives, the revenue and pricing principles and the allowed rate of return objective. This chapter therefore sets important context for the way in which we exercise our judgement under the incentive regimes established by the national electricity and gas legislation.
- Chapter 3 addresses the form and structure of the Draft rate of return guidelines to which this explanatory statement applies. The remaining chapters are devoted to particular elements and parameters of the rate of return and value of imputation credits.
- Chapter 4 discusses the benchmark gearing ratio.
- Chapter 5 discusses the overall approach to return on equity.
- Chapter 6 discusses the risk free rate parameter of the return on equity.
- Chapter 7 discusses the market risk premium.

- Chapter 8 discusses the equity beta.
- Chapter 9 then explains our approach to the return on debt.
- Chapter 10 discusses the data and benchmarks for estimating the return on debt.
- And finally, chapter 11 discusses the value of imputation credits.

1 Overview

1.1 Introduction

The Australian Energy Regulator (AER) is responsible for the economic regulation of electricity and gas transmission and distribution services in eastern and southern Australia under the National Electricity Rules (NER) and the National Gas Rules (NGR) (collectively, the rules). We monitor the wholesale electricity and gas markets, and are responsible for compliance with and enforcement of the rules. We also regulate retail energy markets in the ACT, South Australia, Tasmania (electricity only) and New South Wales.

In the economic regulation of electricity and gas transmission and distribution services the allowed return on capital represents the largest component of the revenue determinations. Our rate of return guidelines set out how we will determine the allowed rate of return on capital. The rate of return is a forecast of the cost of funds a network business requires to fund investment in its network. The guidelines also set out the value we propose to assign to imputation credits.

We developed the current guidelines (the 2013 Guidelines) in December 2013. Those Guidelines can be found at https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/rate-of-return-guideline-2013.

Under the current legislative framework we must periodically review the guidelines and publish amended guidelines if necessary. We must review the 2013 Guidelines by December 2018.

Starting in mid-2017, the AER initiated a review of the 2013 Guidelines.

In conducting this review, we have engaged in the most extensive consultation process yet undertaken by the AER when formulating an approach to calculating the rate of return and determining the value of imputation credits.

We welcome and are grateful for numerous submissions from consumers, service providers, investors and representative groups received throughout this review process. These submissions have assisted our understanding of the issues and informed the exercise of our judgement.

In addition, we have undertaken new initiatives to better engage with both consumers and industry stakeholders to assist us in reaching our draft decision.

We have had the benefit of assistance from Reference Groups that we have established to help facilitate greater engagement with consumers, investors and retailers in the review process. Our Consumer Challenge Panel has also assisted us in taking into account consumer concerns.

An important new initiative for this review has been the establishment of a ‘hot-tub’ of experts in concurrent evidence sessions. In these sessions, experts that have been nominated by different consumer and industry stakeholders openly and frankly

discussed with us and each other some of the key issues that apply to the calculation of the rate of return. We conducted two concurrent evidence sessions prior to making our Draft Decision and the concurrent evidence sessions have proved a valuable tool in helping us to arrive at our Draft Decision.

A further significant new initiative we are undertaking for this review is that, following the publication of this Draft Decision, an independent panel will provide us with a report on their assessment of the evidence and our reasons supporting our Draft Decision. We will then take that independent panel report into account when making our final decision.

We also invite the public to make submissions on our Draft Decision. Submissions on this draft decision should be sent by 5pm AEST Friday 14 September 2018, to rateofreturn@aer.gov.au. Alternatively, submissions can be sent to:

Mr Warwick Anderson

General Manager Networks Finance and Reporting

Australian Energy Regulator

GPO Box 3131

Canberra ACT 2601

We prefer that all submissions be sent in an electronic format (Microsoft Word) and are publicly available, to facilitate an informed, transparent and robust consultation process. Accordingly, submissions will be treated as public documents and posted on our website, unless prior arrangements are made with us to treat the submission, or portions of it, as confidential. Those wishing to submit confidential information are requested to:

- clearly identify the information that is the subject of the confidentiality claim, and
- provide a non-confidential version of the submission.

All materials relating to this consultation, and the process for the conduct of the review, are available on the AER's web site at https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-rate-of-return-guideline.

This enhanced process provides for greater transparency and stakeholder engagement. It will assist us significantly in making a final decision that best achieves the long term interests of consumers.

At the outset, therefore, we wish to place on record our thanks to all those who have participated in this new process.

1.2 The Draft Decision summarised

Rate of return

Overall, our approach to gearing, and to estimating the returns on equity and debt, broadly continues our approach to determining the rate of return adopted in our 2013 Guidelines, with updated parameter estimates and data sources.

However, an important difference between our Draft Decision and our 2013 Guidelines, is that under our Draft Decision the way to calculate the rate of return would be capable of being applied automatically at the time of making a future revenue determination.[1] We consider this will help promote investor certainty and business confidence when entering into financing arrangements.

Our Draft Decision is to calculate the rate of return as a nominal vanilla weighted average of an allowed return on equity and an allowed return on debt.

The gearing ratio is 60 per cent for the allowed return on debt and 40 per cent for the allowed return on equity.[2]

The allowed return on equity will be calculated as an estimated risk free rate plus a market risk premium (MRP) of 6 per cent multiplied by an equity beta of 0.6.[3]

This equates to an equity risk premium of 360 basis points over the estimated risk free rate. The 2013 Guidelines estimated an equity risk premium of 455 basis points (based on a MRP of 6.5 per cent and an equity beta of 0.7) over the estimated risk free rate.

The risk free rate is to be estimated based on an average of the yield on 10 year Commonwealth Government Bonds (CGS) over an averaging period of between 20 and 60 business days. Service providers are free to choose this averaging period subject to the requirements set out in the Guidelines. If they do not select an averaging period that meets the requirements set out in Guidelines, a default averaging period will apply.

The allowed return on debt will be determined on the basis of the revenue neutral transitional arrangements that we recently determined[4] for each service provider to move from an 'on-the-day' approach to a 10 year trailing average approach to estimating the return on debt.[5]

As in the 2013 Guidelines, we consider the appropriate benchmark for estimating the return on debt is the yield on debt instruments issued at a BBB+ investment grade rating.

We will estimate a BBB+ yield using a weighted average of 10 year BBB and A rated yield curves published by the Reserve Bank of Australia, Bloomberg, and Thomson Reuters. Two-thirds weight will be placed on the average yield from the BBB curves

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1 Subject to an assessment that this will achieve the allowed rate of return objective.

2 The gearing ratio is discussed in detail in chapter 4.

3 The return on equity, risk free rate, MRP and beta are discussed in detail in chapters 5-8.

4 We set out our proposed approach in our 2013 Guidelines, and determined the use of the transition and the start date of the transition for each service provider in their first regulatory determination following the 2013 Guidelines.

5 The return on debt approach and parameter estimates are discussed in detail in chapters 9 and 10.

over the debt averaging period and one-third weight will be placed on the average yield from the A curves over the debt averaging period. We do not expect the introduction of the Thomson Reuters curve to materially alter the estimated yield, although it should reduce estimate volatility. We consider that adopting a weighted average of A and BBB yield estimates will better reflect a benchmark BBB+ yield.

Each yield estimate is to be calculated over an averaging period between 10 business days and one year in length subject to certain requirements. Where a service provider does not select averaging periods that meet our requirements we will use default averaging periods.

The same methodology for estimating the rate of return applies for all service providers. We consider the degree of risk that applies to each service provider in respect of the provision of regulated electricity or gas services is substantially similar.[6]

Overall, we estimate that our draft guideline will result in a 45 basis point reduction in the overall rate of return compared to the approach we have applied in our regulatory determinations since the 2013 Guidelines. Our estimate of the impact arising from the return on debt reflects estimates over a recent averaging period.[7] Over the next five years, the total impact could be larger or smaller depending on changes in market conditions.

Imputation credits

We determine a value of imputation credits of 0.5 (or 50 per cent).[8]

This is the same value we estimated in our 2013 Guideline. However, it represents an increase from the value of 0.4 that we applied in revenue determinations made between 2014 and 2018. In practice, this translates to a 10 per cent reduction in our estimated corporate tax allowances.

Reasons

The reasons that support our approaches to calculating the rate of return and determining the value of imputation credits are summarised in section 1.5 of this Overview and then explained in greater detail in individual subject matter chapters.

1.3 The objectives and principles guiding our decision

The National Electricity Objective (NEO) and the National Gas Objective (NGO) establish the ultimate objective of our decision-making.[9] In each case, the objective is

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6 Our consideration of risk and return is in section 2.4.

7 The return on debt estimates capture the impact of our draft guideline using an averaging period of all business days in February 2018. The return on equity impacts are driven entirely by changes to the equity risk premium and therefore do not depend on the averaging period.

8 Imputation credits are discussed in detail in chapter 11.

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

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.[10]

When reviewing the 2013 guideline, and in making this draft decision, we must perform our functions in a manner that will or is likely to contribute to the achievement of the NEO and NGO.

In support of the NEO and NGO, the National Electricity Law (NGL) and National Gas Law (NGL) set out Revenue and Pricing Principles (RPPs).[11] These principles underlie the achievement of the NEO and NGO and we have had particular regard to these principles in making our draft decision.[12]

The RPPs are in essentially similar terms for both electricity and gas. In summary, those principles are:

- A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in—
    - providing regulated services; and
    - complying with a regulatory obligation or requirement or making a regulatory payment.
- 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 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.
- Regard should be had to the regulatory asset base adopted
    - in any previous determination or arrangement, or
    - in the Rules
- 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.
- Regard should be had to the economic costs and risks of the potential for under and over investment by a regulated network service provider in the relevant system.

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

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

12 See chapter 2.

- Regard should be had to the economic costs and risks of the potential for under and over utilisation of the relevant system.

Each of these principles has an important guiding role when determining an appropriate way to calculate the rate of return in order to achieve the NEO or NGO. 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, or provision for, or use of services. It will not be a rate that provides 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 under-investment in the network system. All of these factors would compromise the realisation of the NEO and NGO.

Similarly, if the rate of return is set too high, it will provide an incentive to over-invest 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 underutilised 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 that will lead to neither over nor under investment in assets, and achieve an appropriate balance of sustainable long term consumer outcomes in respect of price, quality, safety, reliability and security of supply. This task is not one that can be undertaken mechanically. Instead, it is one that requires the exercise of judgement looking to future outcomes. The objectives and principles guide our assessment of the evidence.

In addition to meeting the legislative obligations to achieve the NEO or NGO, and having regard to the RPPs, the National Gas Rules and National Electricity Rules also establish an allowed rate of return objective.[13] That objective provides that the allowed rate of return is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of its regulated services.[14] This objective needs to be interpreted consistently with the overall NEO and NGO, and the principles set out in the RPPs.

There are certain common repeated concepts within these legislative objectives and principles that are particularly relevant to setting the rate of return and the value of imputation credits – benchmark efficiency, risk and return. We adopt standard, well established regulatory economic approaches to our understanding of each these concepts.[15]

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13 NER cll. 6.5.2(b), 6.5.2(c), 6A.6.2(b), 6A.6.2(c); NGR r. 87(2) and r.87(3).

14 The allowed rate of return objective is discussed in more detail in section 2.1.3.

15 See AER, *Risk and judgement Discussion paper*, February 2018 and chapter 2 of this decision.

We estimate a benchmark rate of return which is then applied to a specific service provider, rather than determining the returns of a specific service provider based on all of its specific circumstances.[16]

The service providers' actual returns could 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) service providers to retain (fund) any additional income (costs) from outperforming (underperforming) the efficient benchmark.[17]

When estimating our benchmark rate of return we have regard to the degree of risk involved in providing regulated services. This is consistent with the RPPs, 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[18] and it would not be efficient to determine an allowed return that is not commensurate with the risks involved.[19]

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

17 NEL, s. 7A(3); NGL s. 24(2)(b).

18 Handley, Advice on the Return on Equity, Report prepared for the Australian Energy Regulator, 16 October 2014, p. 4.

19 Our assessment of the degree of risk involved in providing regulated services and how we have regard to this risk in estimating the benchmark allowed rate of return is set out in more detail in section 2.4.

Table 1 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 investment incentives. We can encourage dynamic efficiency by setting an allowance that does not distort investment 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.

Legislative amendments for a binding rate of return instrument

Finally, one further objective that we wish to highlight in this Overview relates to the legislative amendments that have been recently proposed by the Council of Australian Governments (CoAG) to replace the current Rate of Return Guidelines with a binding legislative instrument.

We understand that the legislative amendments will require the binding legislative instrument to set out how the estimation of the rate of return will be automatically applied in each regulatory determination without any exercise of discretion.

This would be unlike the current legislative framework, which allows both the service providers and ourselves the opportunity to depart from the 2013 Guidelines if the evidence justified that doing so would result in an outcome that better achieves the legislative objectives.

The proposed legislative amendments include provisions to allow this review of the guidelines to also satisfy the process for developing the first binding rate of return instrument. However, we acknowledge that at the time of this decision the legislative amendments have not been made.

In light of CoAG's commitment to implementing a binding rate of return instrument, we have therefore developed guidelines that are capable of either:

- operating as non-binding guidelines under the current legislative framework; or
- being automatically applied as a binding rate of return instrument if the legislative framework changes.

1.4 The consultation process and key stakeholder comments

We have implemented a new enhanced consultation process for this review that is designed to help us better understand consumer and industry views, and to ensure that we are able to take these views into full consideration when deciding how best to contribute to achieving the NEO and NGO through this Draft Decision.

We think it is particularly important to set out in this Overview the key elements of that process, the key concerns raised, and how we have responded to those concerns in this Draft Decision. We discuss stakeholder comments in more detail throughout the chapters and in the following section that sets out our key reasons for our draft decision.

In this section, we summarise:

- the key steps in our consultation process,
- the key concerns of stakeholders,
- submissions we received on the risks and costs associated with a rate of return that is too high or too low, and
- submissions on the scope of the review.

The consultation process

The key steps in our consultation process have included:

- In July 2017 we issued a consultation paper which sought views on how best to run the Guideline review process
- On 18 September 2017 we held a pre-issues paper public forum
- On 31 October 2017 we released an issues paper requesting views on whether our current approach to setting the allowed rate of return remains appropriate.
- On 28 November 2017 we released a positions paper setting out our positions on the process for reviewing the Guidelines.
- On 15 March 2018 we held a concurrent evidence session to discuss gearing, financial performance measures and risk and judgement. Discussion papers on the topics were made available prior to the session on 28 February 2018. Following the first evidence session we published a transcript of the session.
- On 5 April we held a second concurrent evidence session to discuss gamma, equity beta, market risk premium, the risk free rate averaging period and the

automatic application of the guideline. Discussion papers on the topics were made available prior to the session on 15 March 2018. Following the second evidence session we published a transcript.

- On 21 April 2018 we published a joint expert statement that covered view of experts in relation to many topics discussed at each of the concurrent evidence sessions.
- On 10 May 2018 we published a discussion paper addressing return on debt issues and inviting written submissions by 30 May 2018.

In this process we also formed a number of reference groups to input into the review process. These groups have actively and openly engaged with us throughout the process. This has helped us to take their members views into account in this decision. These groups were:

- A consumer reference group (CRG)
- A consumer challenge panel (CCP16)
- An investor reference Group (IRG)
- A retailer reference group (RRG)

Energy Networks Australia (ENA) and the Australian Pipeline Gas Association (APGA) both have also actively and openly engaged in this process. Both sponsored experts to participate in the evidence sessions. A number of consumer groups have also actively participated in the process including Energy Consumers Australia (ECA), Energy Users Association of Australia, Major Energy Users Inc, and the Public Interest Advocacy Centre (PIAC). ECA also sponsored an expert to attend the expert evidence sessions.

We also encouraged our CRG and ENA to engage directly to exchange views, share perspectives and explore potential areas of common ground. The CRG and ENA held a series of meetings which both have indicated were useful.

Throughout the review process we have received public submissions on our various papers, including submissions from the groups listed above.

We have had full regard to the submissions and other information before us (such as the joint statement of experts and transcripts of the concurrent evidence sessions) in making this decision. The extensive engagement from all stakeholders and stakeholder groups has greatly assisted the AER in determining the draft Guidelines that it considers will best contribute to the achievement of the legislative objectives.

Ultimately, we consider our draft decision balances the views and concerns of the service providers, investors in the sector, and consumers. We consider the overall outcome flowing from our draft decision will better achieve the legislative objectives than the alternatives that have been raised throughout this process and discussed in detail in the explanatory statement chapters.

Key comments of stakeholders

Key comments of service providers, investors, and representative organisations of these parties have included:

- The service providers and their investors value certainty and predictability.[20]
- The current rate of return is about right (if not a little low) and the 2013 Guidelines have been contributing to achieving the NEO and NGO.[21]
- An 'incremental' review of the 2013 Guidelines is appropriate.[22]
- There should be a high threshold to change from the 2013 Guidelines.[23]
- Changes should be based on changed evidence since the 2013 Guidelines.[24]
- Where the AER exercises judgement it should be clear and transparent on how it has done so.[25]

On the individual rate of return input parameter estimates, and the value of imputation credits, it appears many of the service providers and investors do not support a reduction as an acceptable outcome.[26] Rather, if a change was to be made, different groups have also provided evidence to support small increases in the market risk premium and beta and a reduction in gamma.[27]

The ENA submitted[28]:

> Since 2013 Guideline, there have been further material reductions in the allowed return on equity through reduction in the nominal risk free rate. Consequently, maintaining the return on equity parameters from the 2013 Guideline would result in a lower allowed return on equity.
>
> Evidence suggests that current returns, which were significantly lowered in the 2013 Guidelines, are starting to impact investment levels. This is evidenced by lower actual expenditure levels relative to approved allowances.

The APGA submitted[29]:

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20 NSG, *Submission on the RORG review*, 4 May 2018, p.3.

21 ENA, *Response to discussion papers and concurrent evidence sessions*, 4 may 2018, Section 1; NSG, *Submission on the RORG review*, 4 May 2018, pp.10-17; SA Power Networks, AGIP, Citipower, United Energy and Powercor, *AER discussion papers – review of the rate of return guideline*, 4 May 2018.

22 ENA, *Response to discussion papers and concurrent evidence sessions*, 4 may 2018, Section 2.3; NSG, *Submission on the RORG review*, 4 May 2018, p.10; APGA, *Submission to the AER rate of return guideline review*, 04 May 2018, p.2.

23 NSG, *Submission on the RORG review*, 4 May 2018, p.5; APGA, *Submission to the AER rate of return guideline review*, 04 May 2018, p.2.

24 NSG, *Submission on the RORG review*, 4 May 2018, pp11-13

25 NSG, *Submission on the RORG review*, 4 May 2018, pp11-13.

26 ENA, *Response to discussion papers and concurrent evidence sessions*, 4 may 2018, Section 2.3; NSG, *Submission on the RORG review*, 4 May 2018, p.10; APGA, *Submission to the AER rate of return guideline review*, 04 May 2018, p.2.

27 NSG, *Submission on the RORG review*, 4 May 2018, p.15; ENA, *Response to discussion papers and concurrent evidence sessions*, 4 may 2018, Section 7; ACTO Gas, *Submission on rate of return guideline review*, 4 May 2018.

28 ENA, *Response to discussion papers and concurrent evidence sessions*, 4 May 2018, p.3.

> Throughout this process, we have supported the notion of incremental change. To us it means that we start from the current position on estimation approaches and outcomes and identify the need to move away from these. For example, in the case of the current cost of debt approach or current foundation model approach (to measure the cost of equity), the AER should consider any material changes in risk or market conditions that require changes to the current method. If the risks and markets conditions have changed material, only then consider looking at alternative approaches, but if they have not, do not make substantive changes to the status quo.

Comments from different consumers and consumer representative groups in this process include:

- Even under an incremental review the starting points for the parameters (estimated in the 2013 Guidelines) need reconsideration.[30]
- The current rate of return is too high and has not achieved the NEO.[31]
- The AER was conservative (in favour of the service providers) in estimating all WACC input parameter values towards the top of empirical ranges (or in favour of service providers) in its 2013 Guidelines. In this review, the AER should set less conservative estimates.[32]
- Consumers themselves are facing large risks associated with increasing energy prices, particularly vulnerable consumers. This should be given consideration when the AER exercises judgment in the determining the rate of return and gamma. In light of these concerns, the AER should not be conservative in exercising its regulatory judgement in favour of service providers.[33]
- Relatively lower demand growth and asset utilisation warrant a less conservative approach (less biased towards encouraging investment).[34]
- With excess capacity present in most networks the balance of risks between too much and too little investment has shifted and consumers suggest that they are not concerned about too little investment in the next period due to the large amounts of investment over the past decade.[35]

All consumer based submissions supported a decrease in the overall rate of return, although the appropriate decreases varied in consumer submissions. The CRG

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29 APGA, Submission to the AER review of the rate of return guideline, 4 May 2018, P.2

30 CCP, *Submission on RORG review and concurrent evidence sessions*, 4 may 2018, section 3.1.

31 CCP, *Submission on RORG review and concurrent evidence sessions*, 4 may 2018, section 5; CRG, *Submission to the AER rate of return guideline review*, sections 2 and 3.

32 CCP, *Submission on RORG review and concurrent evidence sessions*, 4 may 2018, section 3.4; CRG, *Submission to the AER rate of return guideline review*, p.35.

33 CRG, *Submission to the AER rate of return guideline review*, section 3.

34 CCP, *Submission on RORG review and concurrent evidence sessions*, 4 may 2018, p.24; CRG, *Submission to the AER rate of return guideline review*, section 3.

35 CRG, *Submission to the AER rate of return guideline review*, section 3.

supported a reduction in the MRP (from 6.5 per cent to 5.75 per cent), a reduction in beta (from 0.7 to 0.3), and an increase in gamma from 0.4 to 0.83.[36] The CRG stated[37]:

> Whilst there is no formal mechanism for testing whether the Guideline serves the long term interests of consumers, available evidence demonstrates the objectives are not being met. The reverse is occurring in an environment of increasing energy prices that could be described as an 'affordability crisis'.
>
> Increasing network charges have been a significant contributor to these unsustainable prices.
>
> Over the last decade the combined regulatory asset base (RAB) of the electricity distribution networks has almost doubled while network utilisation has declined from just under 60 per cent to just over 40 per cent. Despite these changes, network businesses are continuing to enjoy string earnings and are trading at multiples of 1.3 to 1.6 of the RAB. Conversely, there is no evidence of under-investment resulting in a decline in network reliability.

On the other hand CCP16 supported a relatively smaller reduction in the MRP (from 6.5 per cent to 6 per cent), in beta (from 0.7 to 0.6) and an increase in gamma from 0.4 to 0.5.

Consumers also submitted that our cost of debt allowance is too high. CCP 16 submitted[38]:

> The analysis by Chairmont (April 2018) of the debt portfolios and strategies of the networks provides empirical evidence that the actual costs of debt of the network firms may be lower than the ROD that is currently estimated by the AER.

A summary of stakeholder submissions are contained as an appendix in most of the explanatory statement chapters. Submissions are available on our website.[39]

Submissions on the risks and costs associated with a rate of return that is too high or too low

This review has been undertaken in an environment of heightened consumer concern about increasing energy costs and relatively large (and in some cases underutilised) investment in regulated assets over recent years.

Some consumer submissions referred to 'a conventional wisdom' in Australian energy regulation – namely, that when faced with uncertainty it is better to err by choosing

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[36] CRG submitted that the MRP should be in the range of 5.5 per cent to 6.0 per cent. CRG submitted that equity beta should be in the range of 0.2 to 0.5, and that a point estimate should be below the midpoint of this range.

[37] CRG, *Submission to the AER rate of return guideline review*, pp.v-vi.

[38] CCP 16, *Submission to the AER on its allowed rate of return on debt discussion paper*, May 2018, p.4

[39] https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-rate-of-return-guideline

outcomes that are likely to promote too much investment rather than too little. During the guideline review process, this notion was challenged.

The CCP 16 stated:[40]

> In the past, governments and regulators in Australia have emphasised regulatory outcomes that were designed to ensure sufficient investment. However, in the last 5 years, market circumstances have changed significantly and many networks now have excess capacity, flat demand, and the ability to manage constraints through demand side rebates to influence behaviour.
>
> In our view, the evidence taken as a whole strongly suggests that historical rate of return allowances have been higher than necessary to encourage efficient investment, particularly given the shift away from incentivising investment to consolidating investment decisions of the past.

First, consumers submitted that when we exercised judgement in the 2013 guideline, we did so by choosing outcomes that were systematically in favour of the service providers and their investors. Specifically, consumers point to our choices of beta at the upper end of a possible range (including reference to the Black CAPM), MRP (and our use of DGMs), use of the Wright model, term of debt, choice of debt data series and taxation allowance. It was submitted that these choices have a compounding effect that are likely to lead to too high an overall rate of return and, as such, will not properly take into account the RPPs.

Second, consumers submit that the bias in our judgement has led to an overall rate of return that is too high and this has encouraged excessive investment in networks. Further, the costs of too much investment have been understated. Consumers point to rapid increases in network revenues and asset bases, financial distress experienced by consumers, a chilling effect on the broader economy, but buoyant investment in and acquisitions of network assets.

Third, consumers point to declining demand, declining network utilisation, declining average age of assets, a positive upward trend in measures of network performance and the positive option value that can be realised by deferring network investment. As such, consumers submit that the balance of risks has shifted. There is little risk from under-investment because there is unutilised capacity present in each of the network systems.

Consequently, consumers submit that when we exercise judgement in this current guideline process we should do so in favour of a lower, rather than a higher, rate of return. When put in the context of the NEO and NGO, consumer representatives have clearly indicated, during this consultation process, a willingness to accept a higher level of risk in respect of the rate of return and the investment it is intended to promote in exchange for lower prices.

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[40] CCP 16, *Submission on RORG review and concurrent evidence sessions*, 4 May 2018, p.5.

However, we also accept submissions made by service providers and investors that we should exercise our judgement with care. There is an ongoing need for investment to replace existing assets, to address locational peak demand and to reconfigure networks in response to changes in the mix of generators. Continued investor confidence is important in achieving these investment outcomes. We are conscious that the rate of return should be set in a manner that is sufficient to attract capital on a long-term sustainable basis, given the opportunity costs, if we are to achieve the NEO and NGO.

Ultimately we are seeking to reach a decision that will promote efficiency in the long term interests of consumers. We consider this requires a degree of caution when exercising our judgement. Nevertheless, we are cognisant of the cumulative effect of choosing high parameter estimates from a reasonable range of estimates and the risks that might follow.

Overall, we accept that these propositions, as highlighted by both consumers and industry representatives, are important considerations. They are relevant factors to be considered in the context of the RPPs and our assessment of how best to achieve the balance of factors set out in the NEO and NGO.

We have taken these considerations into account in this draft decision particularly when considering a best estimate for the market risk premium and equity beta in our calculations for the return on equity. We have also taken these factors into account when deciding how best to estimate the BBB+ yield when estimating the return on debt.

There is a sharp disagreement between consumers on the one hand and networks and investors on the other about how the rate of return should be set in order to advance the NEO and NGO. While there is a level of agreement about the Framework we should apply, its application is strongly contested. We have been conscious to listen carefully to both sides of the debate and to weight the arguments put to us.

Where we exercise judgement, we do so placing our emphasis on market data and avoiding choices that are influenced by any material bias in either promoting or discouraging investment. We consider that the promotion of efficient investment will flow from a decision that reflects well established economic approaches as supported by the available evidence, always having regard to the principles set out in the RPPs and the various elements we are seeking to achieve in the NEO and NGO.

Key stakeholder comments on the scope of the review

We first publically proposed a 'targeted' approach to our review in our 18 September 2017 workshop and in an October 2017 issues paper.[41] The specific questions we asked were:[42]

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[41] AER, *Issues paper – Review of the rate of return guidelines*, October 2017, p7.

[42] AER, Issues paper – Review of the rate of return guidelines, October 2017, p

- Should the AER build on the knowledge base gained from development and application of the current guideline or start from a blank slate?
- What are the high, medium and low priority issues for the guideline review?
- Should the AER prepare a prescriptive guideline to enable the mechanistic estimation of the rate of return through a formula?

While most participants agreed that the AER would be unwise to start from a blank slate, several groups noted that the knowledge gained to date on the AER's approach should be open to question.[43] In many ways, this also stems from the concerns discussed in the previous section on risks and costs in setting a rate of return that is too high or too low.

In our issues paper we indicated we were reconsidering the weight to give to different pieces of evidence, including whether some information referred to in our 2013 Guideline should be given any weight. For example, we asked stakeholders whether we should use the Black CAPM to inform the equity beta point estimate and the appropriate role of dividend growth models in setting the allowed return on equity.[44]

While submissions on our issues paper were generally supportive of an 'incremental approach' to this review, submissions from consumers suggested the 2013 Guidelines had not achieved the NEO and NGO on the basis that the allowed rate of return from applying it was too high.[45] They also submitted that it should not be simply assumed that the approaches or the parameter estimates adopted in the 2013 Guidelines would remain appropriate to achieve the rate of return objective, and the NEO and NGO.

We note that there was a general level of agreement amongst stakeholders to:

- Applying a 'utilisation' based post-company tax approach to estimating the value of imputation credits
- Applying the foundation model approach for estimating the allowed return on equity, with the SLCAPM used as the foundation model
- Using a benchmarking approach for estimating all key parameters when estimating the allowed return on equity and allowed return on debt
- Continuing the use of a trailing average cost of debt with a revenue neutral transition
- Using third party data services for estimating the allowed return on debt

In light of these stakeholder comments we have used our 2013 Guidelines as a starting reference point for our analysis, mindful of our obligation to reach a decision that we

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43 AER, *AER Rate of Return Pubic Workshop: Discussion* summary, September 2017, p3.

44 AER, *Issues paper – Review of the rate of return guidelines*, October 2017, p9.

45 Energy Consumers Australia, *Review of the rate of return guideline*, December 2017, p XX. [add in other submissions here]

are satisfied will, or is likely to contribute to the achievement of the NEO and NGO and which meets the allowed rate of return objective.

At our public forum in September 2017 some stakeholders questioned whether our 2013 Guidelines had contributed to achieving the legislative objectives. Similar submissions were subsequently made by the CRG, ECA, MEU, and EUAA.[46]

The CRG submitted that it considers our 2013 Guidelines have not been contributing to achieving the objectives to the greatest degree, stating:[47]

> The CRG strongly believes the Guideline is not meeting its objective.
>
> There is no testing as to whether the Guideline serves the long term interests of consumers. The available evidence demonstrates the objectives are not being met.

The EUAA submitted:[48]

> Our view is that the 2013 Guideline has not met the NEO and NGO objectives.
>
> …
>
> Consumers have received a safe and reliable service. Unfortunately, we believe it has been achieved with far too much capital investment (see the fall in capacity utilisation rates) and poor productivity by many networks with the result that prices are far too high. Many networks are not at "benchmark" efficient levels and yet they continue to earn a secure revenue flow that produces, what limited evidence suggests, to be above normal profits for a regulated natural monopoly.

By contrast, the network shareholder group submitted:[49]

> The framework for incentive-based economic regulation is working as intended, specifically where investment is made by the private sector.

Energex and Ergon Energy submitted that:[50]

> Certainly, there are aspects of the AER's current approach that most stakeholders agree will contribute to the achievement of the NEO and ARORO.

Energy Networks Australia submitted that our current review should build on the 2013 Guidelines, stating:[51]

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46 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 16.

47 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 16.

48 EUAA, EUAA submission – AER Rate of Return Review Issues Paper October 2017, December 2017, p. 2.

49 NSG, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), May 2018, p. 1.

50 Energex and Ergon Energy, AER Issues Paper - Review of the Rate of Return Guidelines - Ergon Energy and Energex Submission, December 2017, p. 2.

51 ENA, AER Rate of Return Guidelines Response to Issues Paper, December 2017, p. 3.

> The 2017 Rate of Return Guideline process is an opportunity to build on considerable work undertaken in the 2013 guideline review process, and network businesses support an incremental approach building on this past guideline review

If the rate of return derived from our guideline is too high or too low then it will not promote the achievement of the legislative objectives. Consumer groups have strongly advocated that allowed rate of return determined since our 2013 guidelines has been too high and has therefore not promoted efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity.

We acknowledge that this review is being undertaken in an environment of heightened consumer concern about increasing energy costs and relatively large (and sometimes underutilised) investment in regulated assets bases over recent years. While the rate of return is an important contributor to network prices, there are other network and non-network costs that also contribute to overall energy prices. Nonetheless, we are cognisant of the effect that higher energy prices may have on the willingness of consumers to pay for further improvements in network reliability.

We have had regard to these factors when considering the rate of return and value of imputation credits for this decision. We have done so by adopting an approach of focusing on the best empirical estimates for rate of return parameters. In this way we consider we can determine an approach that is most likely to promote the NEO and NGO.

We consider it is important for the achievement of the legislative objectives that we periodically review our rate of return and value of imputation credits. This process of review, combined with the use of incentive regulation, is a key driver of efficiency and the continued achievement of the legislative objectives over time. Therefore, the achievement of the legislative objectives should not be viewed solely in a static sense.

On the use of incentive regulation, the ECA submitted:[52]

> The objective is not to set the rate of return based on a benchmark so that the provider can outperform the rate of return by the way it is financed – the intention is that the rate of return is a constraint so that the provider has maximum incentive to generate higher returns by efficiency in its investments and its operations.

We agree 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 provides (in expectation) an opportunity for service providers to recover their efficient costs (without expectation of monopoly rents).

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[52] ECA, Review of the rate of return guideline: Response to the AER Issues Paper, December 2017, p. 11.

We note that 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 service providers. In the chapter 10 we set out how we have considered service providers' revealed cost information when deciding on our approach to debt.

1.5 Summary of our reasons in support of our Draft Decision

Actual (realised) returns and the overall allowed rate of return

The CCP16, CRG, ECA, EUAA, and MEU submitted that we should examine information on the actual returns achieved by service providers, through data on actual profitability and RAB multiples, when considering if our rate of return achieves the legislative objectives. The CCP16 submitted that actual profitability and RAB multiples could be used as a cross-check on the selection of parameter values and the overall rate of return.

We consider actual profitability and RAB multiples in chapter 2. In summary, actual profitability and RAB multiples from asset sales may provide some indication of the appropriateness of the allowed total rate of return. However, they may also be indicative of other elements of the firm's cash flows, such as unregulated activities and outperformance on expenditure allowances. Further, sales that have already occurred and past profitability may not reflect changes to the overall rate of return that are occurring at present.

Overall, we consider that these measures cannot be used to directly determine parameter estimates for the allowed rate of return. We agree with the CCP16 submission that there is difficulty in disaggregating the information contained in RAB multiples and historical profitability measures to determine the degree of outperformance of the allowed rate of return.

However, we consider that there may be useful information within the trends in RAB multiples and historical profitability measures over time. Comparisons of RAB multiples and historical profitability measures can provide information on the performance of the regulatory system as a whole. This information may be helpful in considering whether the business' actual rate of return has been systematically lower or higher than the allowed rate of return.

The CCP16 submitted that this information cannot be used at a parameter level but can inform the overall exercise of judgement in setting the rate of return or reviewing other elements of the regulatory regime[53]. We agree that RAB multiples and historical profitability may provide useful contextual information and cause for further examination of the material we rely on when estimating rate of return parameters (other elements of the regulatory regime are beyond the scope of this review). We have done this as part of this review through further consideration of the impact of regulation on equity beta estimates within our comparator set (see chapter 8), examination of service providers' actual debt issuances (see chapter 10), and further consideration of the most appropriate third-party debt data to reflect our benchmark

[53] Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, pp 27-28.

credit rating (see chapter 10). Though outside the scope of this review, we are also currently undertaking reviews of other parts of our regulatory regime, such as our review of our regulatory tax approach and our review of profitability measures for gas and electricity businesses.

In addition, we note in chapter 2 that use of market data is an important concept for achieving the legislative objectives, and we do have regard to actual returns in other parts of our rate of return estimation. Our equity beta estimation is based on data on the returns (capital gains and dividends) to listed Australian energy network firms relative to the returns on the ASX300. When estimating the market risk premium we have regard to the historical returns on the Australian stock market. We have also reviewed the actual debt costs of regulated service providers.

Risk

We are required to estimate an efficient rate of return that contributes to the achievement of the NEO and NGO, the RPPs and the ARORO by promoting efficiency in the investment, operation and use of, energy network services for the long term interests of consumers. We must consider how to efficiently compensate for the risk exposure of service providers in supplying regulated services.

It is important to emphasise that the relevant risk is the risk associated with provision of regulated services. It is not the risk of the service provider more generally. This principle is reflected in the NEO/NGO, revenue and pricing principles and the allowed rate of return objective.

Our view is that the only risk that should be compensated through the rate of return is systematic risk. This has agreement from stakeholders and experts. Systematic risks are those that affect the entire economy and cannot be eliminated through diversification. Since non-systematic risks can be eliminated by diversification, investors do not require compensation for them. We also consider that technological risks and regulatory risks as submitted by service providers should not be compensated by the rate of return as these are non-systematic risks.[54]

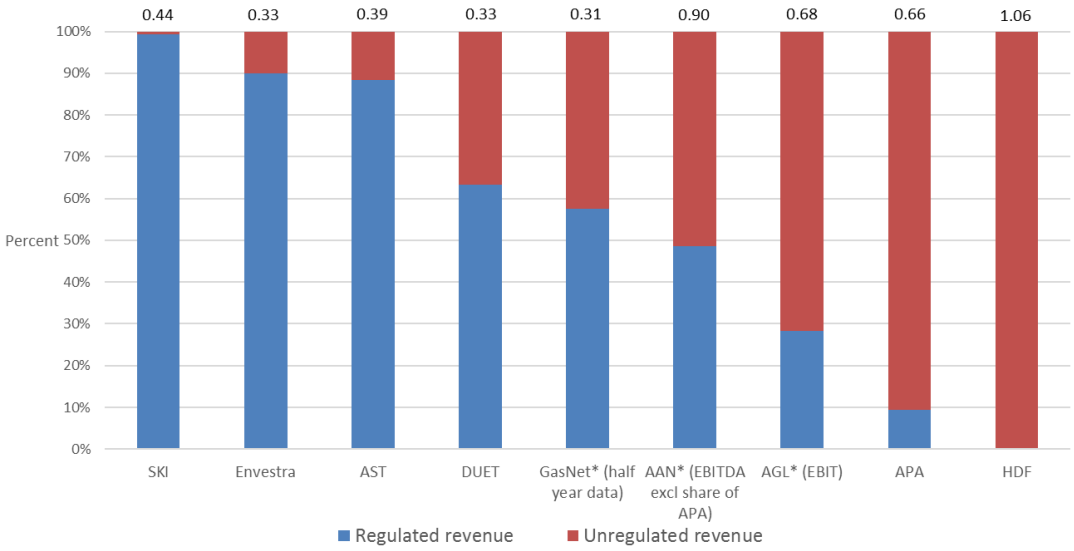
Stakeholders have submitted divergent views on the risks of supplying regulated energy services, how these risks should be compensated and whether market data is appropriate for measuring these risks. We consider that an efficient return for risk should be estimated through a forward-looking rate of return using relevant market data. We consider this is best achieved through a continued reliance upon the foundation model framework adopted in the 2013 Guideline with the SLCAPM as the foundation model together with the trailing average approach to debt that we have adopted in our revenue determinations during the last 3 years. This approach provides a return for each service provider at the prevailing efficient market rates for their

[54] The extent to which these risks should be compensated through other aspects of our regulatory determinations will be considered on a case by case basis as part of each determination.

systematic risk at each point in time when the return on equity, or annual update of debt in the trailing average, is determined.

We continue to be of the view that the overall systematic risk of supplying regulated services is low. This is due to the nature of the regulated services being provided as essential services. Risk is also mitigated by the regulatory framework through mechanisms such as cost pass through provisions. Moreover, the regulated asset base is protected, and an allowed return on capital and depreciation is provided via regulated revenues including indexation. Consumers have submitted that systematic risk is lower for regulated services than for other services offered by service providers because regulation mitigates the ability to extract monopoly rents and increases the certainty of the revenue stream, thereby reducing risk. We find that there is support for this proposition as Figure 1 shows a trend of equity beta estimates increasing as the proportion of regulated revenue decreases.

Figure 1 Regulated revenue and beta estimates



Source: Bloomberg; AER analysis

The division between regulated and unregulated is based on the most recent publicly available information on the proportion of regulated and non-regulated activities for a financial year. SKI is based on page 90 of its 2017 Annual Report; DUET is based on its 2016 Annual Report;[55] Envestra is based on page 5 of its 2013 Annual Report; AST is based on page 75 of its 2017 Annual Report; GasNet is based on page 3 of its report for the half-year ended 30 June 2016; AAN is based on page 24–25 its 2006 Annual Report; AGL is based

[55] In our estimation, Dampier to Bunbury Natural Gas Pipeline (DBNGP) is 100 per cent regulated even though DUET's 2016 Annual Report reported that the ERA's regulatory tariff applies to 15 per cent of the capacity to 2020. This is because the ERA still regulates the pipeline and its regulatory tariffs would apply in the absence of renegotiated Standard Shipper Contracts as indicated by DUET (page 11 of 2016 Annual Report).

on page 68 its 2006 Annual Report; APA is based on page 16 of its 2017 Annual Report; HDF is based on page 10 of its 2011 Annual Report.

This approach to risk provides the context for our assessment of the key parameters within the rate of return. It informs our assessment of what amounts to a similar degree of risk to that faced by each service provider in the provision of their respective regulated services for the purposes of the allowed rate of return objective. It informs our assessment of what is an efficient and commensurate return for a service provider's risks.

Overall approach to return on equity

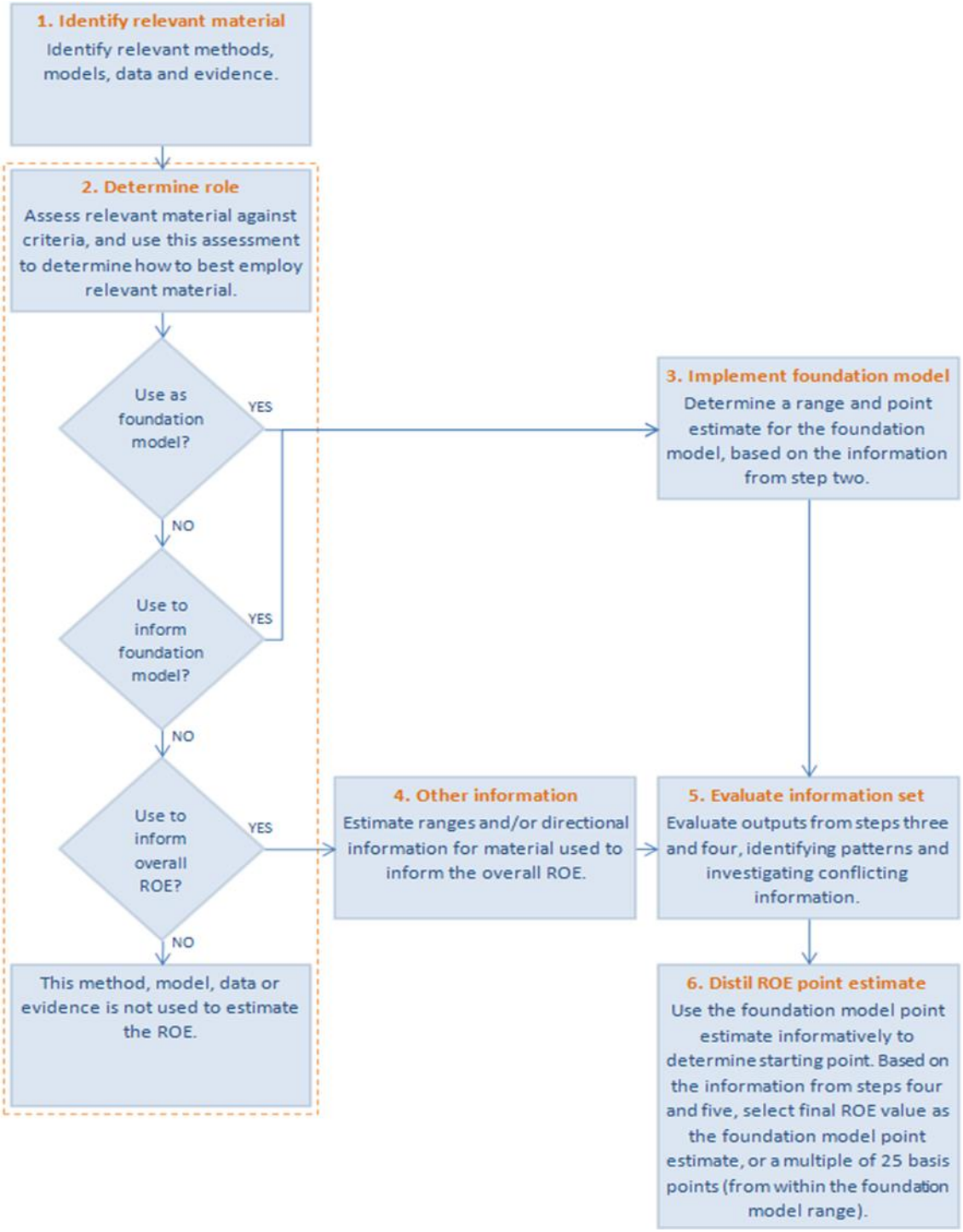
In determining the way to calculate the allowed return on equity we have used our foundation model approach with the Sharpe-Linter Capital asset pricing model (SLCAPM) as the foundation model. The principal reason for this is that SLCAPM is theoretically based, is the most extensively used and accepted asset pricing model, and has survived the test of time. This essentially reflects the same reasons set out in our 2013 Guideline.[56] It maintains the general approach affirmed by the Australian Competition Tribunal.[57]

The foundation model approach provides a framework for systematically considering relevant information and then exercising our judgement on the appropriate choice of the regulated return on equity. The approach recognises that our task requires us to exercise judgement because we are estimating a forward looking return on equity that will satisfy the national electricity and gas objectives. Further, the information available to inform our decision is imprecise, incomplete and to some extent, conflicting. Figure 2 provides a flow chart of the six steps in our foundation model approach process.

[56] AER, Explanatory statement, Rate of Return Guideline, 2013, section 5; AER, Explanatory statement appendices, Rate of Return Guideline, 2013, Appendix A – Assessment of models.

[57] Application by PIAC and AusGrid, [2016] ACompT 1, Return on equity paras 632-814, see use of the SLCAPM paras 714 -804.

Figure 2 Foundation model approach flowchart



Most experts at the concurrent evidence sessions agreed that we should continue to apply the foundation model approach and focus on its application in light of the

evidence that has evolved.[58] No stakeholders submitted that we should review our foundation model approach. This is consistent with our position, accepted by all stakeholders that this review should be an incremental review. In this context, we will update the relevant data and review new evidence so that our judgement can be exercised within the established approach to estimating the allowed return on equity. We consider that this provides the necessary certainty and predictability that stakeholders have said they value whilst allowing us to discharge our regulatory task in a manner that is most likely to contribute to the legislative objectives.

We agree that the foundation model approach should be continued and adopted in this 2018 Guideline review for estimating the return on equity. In this context, we will update the relevant data and review new evidence so that our judgement can be exercised within the established approach to estimating the allowed return on equity. We consider that this provides the necessary certainty and predictability that stakeholders have said they value whilst allowing us to conduct our regulatory task in a manner that is most likely to contribute to the legislative objectives.[59]

Overall, in implementing steps 1 and 2 of our foundation model approach, we have not identified any additional classes of material that we did not consider when preparing our 2013 guideline. Stakeholders did not submit any additional classes of material, but some stakeholders submitted that we should reconsider the weight we give to different classes of material when exercising our judgement. We continue to assign the same roles to each piece of material as we did in 2013. However, when implementing step 3 within our overall framework, and based on new evidence and current material, we are persuaded that we should adjust the relative merit assigned to some pieces of material. The material, role and relative merit in 2018 is shown in Figure 3.

Figure 3 Relevant material and role

Material (step one)	Role in 2013 (step two)	Role in 2018 and relative merit
Sharpe–Lintner CAPM	Foundation model	No change
Black CAPM	Inform foundation model parameter estimates (equity beta)	No change in role. However, at this time we have diminished confidence in the robustness of the Black CAPM and are therefore not persuaded to select an equity beta towards the top of the observed empirical estimates
Dividend growth models	Inform foundation model parameter estimates (MRP)	No change in role. However, at this time we have diminished confidence in the robustness of DGMs and are therefore not persuaded to select an MRP towards the

[58] Joint Expert Report, RORG review – Facilitation of concurrent evidence sessions, CEPA, 21 April 2018, section 2.1.3, p.19.

[59] This approach is consistent with the CCP16's submission that, incremental change means continuing to work within the CAPM and foundation model framework, not limiting the exercise of our statutory obligations to satisfy a self-imposed 'incremental approach' and considering all available data. See, CCP 16, *Submission to the AER on its rate of return guideline review concurrent evidence sessions*, 4 May 2018, section 3.1, pp. 14-16.

		top of the observed empirical estimates of historical excess returns.
Fama–French three factor model	No role	No change
Commonwealth government securities	Inform foundation model parameter estimates (risk free rate)	No change
Observed equity beta estimates	Inform foundation model parameter estimates (equity beta)	No change
Historical excess returns	Inform foundation model parameter estimates (MRP)	No change
Survey evidence of the MRP	Inform foundation model parameter estimates (MRP)	No change
Implied volatility	Inform foundation model parameter estimates (MRP)	No change
Other regulators' MRP estimates	Inform foundation model parameter estimates (MRP)	No change
Debt spreads	Inform foundation model parameter estimates (MRP)	No change
Dividend yields	Inform foundation model parameter estimates (MRP)	No change
Wright approach	Inform the overall return on equity	We have diminished confidence in the robustness of the Wright approach.
Takeover/valuation reports	Inform the overall return on equity	No change
Brokers' return on equity estimates	Inform the overall return on equity	No change
Other regulators' return on equity estimates	Inform the overall return on equity	No change
Comparison with return on debt	Inform the overall return on equity	No change
Trading multiples	No role	No change
Asset sales	No role	No change
Brokers' WACC estimates	No role	No change
Other regulators' WACC estimates	No role	No change
Finance metrics	No role	No change

Implementing step 3 of the foundation model approach (estimating the SLCAPM) is a key step, in our six step approach and it has been adopted and applied in all our determinations since 2013. We undertook extensive consultation and assessed a number of models including the dividend growth model (DGM), Black CAPM and the

Fama French model for suitability as the foundation model, before deciding on the SLCAPM. Our comprehensive assessment is in the 2013 Guideline documentation.[60]

We received a wide range of submissions supporting the SLCAPM framework.[61]The joint expert report noted that there has been no compelling evidence to change our approach.[62] The Network Shareholder Group and Energy Networks Australia submissions following the concurrent expert sessions supported this view.[63] The Consumer Reference Group submitted that a more fundamental review was required due to major issues with the CAPM.[64] While we acknowledge that all models are simplifications, we agree with Partington and Satchell that the SLCAPM framework is the best approach to reflect the systematic risk of a benchmark efficient entity.[65]

Our positions on the SLCAPM parameter inputs estimated in step 3 and our key reasons are set out below.

Risk free rate

Our draft decision is to use daily 10 year Commonwealth Government Security (CGS) yields as the basis for calculating the return on equity. The CGS yields should be averaged over a period as close as practically possible to the start of the regulatory control period to determine the risk free rate. This is the same as our 2013 Guideline, except that we have now widened the averaging period from 20 business days to a period between 20-60 days as nominated by service providers.

ENA and the CRG supported the change to the averaging period and we had no opposing submissions. ENA submitted:

> This proposal [a longer period proposed by the regulated business between 20-60 business days] is outlined in the AER MRP discussion paper, and is supported by both the ENA and CRG.[66]

The CRG stated:

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60 AER, Explanatory statement, Rate of Return Guideline, 2013, section 5; AER, Explanatory statement appendices, Rate of Return Guideline, 2013, Appendix A – Assessment of models.

61 Network shareholders group, Submission on the Rate of Return Guideline review, p.9, Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions, p.8, Australian Pipeline Gas Association, Submission to the AER, Review of rate of return guideline, 4 May 2018, p.2.

62 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence Expert Joint Report, April 2018, p.23.

63 Network Shareholder Group submission to the Rate of return guideline review, 4 May 2018, p 9, Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions, p. 8.

64 Consumer Reference Group, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p.37.

65 Partington, G., Satchell, S., *Report to the AER: Allowed Rate of Return 2018 Guideline review, May 2018.*

66 ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.4.

> On the basis of that dialogue [between the CRG and ENA], the CRG supports the AER's proposal [a longer period between 20-60 business days] [67]

Our reasons for lengthening the averaging period as nominated by service providers are:

- that it provides service providers the opportunity to mitigate their exposure to short term volatility in CGS yields
- the longer period does represent a further departure from the theoretical ideal of an on-the-day rate. However, the pragmatic benefit of giving service providers flexibility in choosing the length of the period is likely to reduce volatility and is in the interest of all stakeholders.
- allowing service providers to nominate their own averaging period has a pragmatic benefit also as it provides them with further flexibility in how they mitigate their exposure to short term volatility, through the use of financial arrangements

Our draft decision is to maintain the use of a 10 year CGS term as it is consistent with the 10 year term used for the return on equity parameters. The CRG suggested using a term of five years for the risk free rate, but this would be inconsistent with the term used for the return on equity parameters. [68]

We have codified the process for determining the risk free rate according to the methodology in our draft decision so that it can be applied during the life of the Guideline without exercising discretion, as required under the draft legislation for a binding guideline.

MRP

The market risk premium (MRP) is the excess return above the risk free rate that investors require (in an ex-ante sense) to invest in the market portfolio. Our MRP estimate for this Guideline is 6.0 per cent selected from a range of 5.0 to 6.5 per cent based on historical excess returns. This point estimate compares with 6.5 per cent in our 2013 Guideline.

We have looked at the evidence available to us and consider that the overall approach for setting the market risk premium in the 2013 Guideline remains appropriate. That is, we continue to give most weight to historical excess returns (HER) and less weight to other evidence.

Stakeholders expressed divergent views on a variety of topics related to the MRP. Service providers and the Network Shareholder Group (NSG) stated that more weight should be given to the DGM and the Wright Approach and less or no weight to geometric averages of HER. ENA submitted:

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[67] CRG, S*ubmission to the AER rate of return guideline review,* 04 May 2018, p.39.

[68] CRG, S*ubmission to the AER rate of return guideline review,* 04 May 2018, p.44.

> The Dividend Growth Model (DGM) provides useful evidence on the current MRP and should be given explicit and material weight by the AER.[69]

> ENA reiterates the view … that the geometric averages is inappropriate for the purpose of estimating the expected excess return … the geometric average should not be used and only the arithmetic average should be used for the purpose of setting an allowed rate of return.[70]

Consumer groups submitted that more weight should be given to geometric averages of HER and no weight should be given to DGMs and the Wright Approach. The CCP16 stated:

> Whilst recognising that the DGM has a 'solid theoretical basis' and has value in certain circumstances CCP16 remains concerned about the reliance of the DGM in the context of an ex-ante regulatory decision.[71]

CCP 16 submitted that the AER has not placed adequate reliance on the outputs of the geometric average nor critically assessed the problems in the arithmetic average given the volatility of the annual Australian equity market returns of 17.7 per cent that Dimson, Marsh and Staunton (2015) report.[72]

Experts agreed that HER, DGM and surveys can be used to estimate the MRP. They concluded that a long term series of returns are useful for estimating the long-run MRP but disagreed on a range of topics including the role of the DGM and the use of arithmetic versus geometric average returns. Our approach and views on these differences are set out in our key reasons below.

These differences in approach led stakeholders to recommend different values for the MRP. Service providers and the NSG highlighted increased risks and an increase in estimates of HER and recommended use of an MRP of 7 per cent. By contrast, consumer groups submitted the 2013 Guideline MRP was too conservative and pointed to greater stability in market conditions. CRG recommended an MRP of no more than 3.6 per cent based on its view that the geometric mean of the HER between 1958 and 2017 is the most appropriate measure.[73] CCP 16 recommends an MRP no higher than 6.0 per cent based on using HER estimates as an anchor to estimating the MRP and giving more weight to geometric averages.[74]

When exercising our regulatory judgement, we rank the utility of different types of evidence at that time and then we qualitatively consider whether our initial estimate of

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69 ENA, *Response to Discussion papers and concurrent expert evidence sessions*, May 2018, p.10.

70 ENA, *Response to Discussion papers and concurrent expert evidence sessions*, May 2018, pp.161-162.

71 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, p.89.

72 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, p.88.

73 CRG, *Submission to the AER rate of return guideline review,* 04 May 2018, p.57.

74 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, p.87.

the MRP should be moved up or down.[75] In the 2013 review process, we stated that 6.0 per cent is an appropriate estimate of the historical excess returns (HER) evidence and the starting point for our determination of a point estimate.[76] We, then moved our estimate up based on the direction of the other evidence, particularly having regard to DGM evidence.

Our key reasons for choosing a market risk premium of 6.0 per cent are:

- We consider that most reliance should be placed on estimates of HER. This material is widely used amongst regulators and market practitioners and is transparent and replicable. We take into account arithmetic and geometric averages over a range of time periods. Since 2013, some time periods now show increased averages. Table 2 below displays the latest HER and the estimates as at 2013. It shows the arithmetic average range of 6 per cent to 6.5 per cent and geometric range of 4.2 per cent to 5.0 per cent. The latest estimates of HER leads us to a range of 5.0–6.5 per cent. This gives consideration to all the information as well as trends in the data and multiple time periods whilst giving most weight to the arithmetic averages of single year returns. From this range, 6.0 per cent is an appropriate HER estimate at this time and the starting point for our determination of a MRP estimate.
- The key reason for the decrease to our MRP estimate from 6.5 to 6 percent per annum is, in this 2018 review process, our diminished confidence in the robustness of DGMs. We are therefore not persuaded to select a MRP towards the top of the observed HER range.
- Our confidence in DGM estimates in the Australian context has decreased since the 2013 Guideline. We note that experts are divided on the level of confidence we should place on DGMs. The major concern with the reliability of estimates from DGMs revolve around the challenge of forecasting the growth rates in dividends, particularly the terminal growth rate. We recognise we had concerns with the use of DGMs in 2013 as well, and note ENA's view that our concerns are not new and therefore we should not adjust our view.[77] However multiple submissions have stated these issues have become better highlighted since the 2013 guideline. Since 2013, our concerns about possible biases and diverging results have

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[75] ENA, *Regulatory discretion and market risk premium determination*, 26 June 2018.We acknowledge receipt of a late submission from the ENA on 26 June 2018 which has not been subject to a full assessment. The submission included 3 options for exercising regulatory discretion and our initial assessment is as follows. The first option involves assigning specific numerical weights to each relevant piece of evidence. Our experience suggests that this level of precision is not possible. The second option is to set out a ranking of weights to each piece of evidence in terms of relative weight in achieving the final MRP. This option appears to be largely similar to our current approach to exercising regulatory discretion. The third option which recommends setting a 'neutral' long run estimate (for MRP or Total Market Return) as the default and then qualitatively making adjustments, based on a pre-set movement up/down relative to strength of the evidence. Our initial view is that this option would unnecessarily restrict future exercise of regulatory judgment because of 'default' settings becoming a hurdle/onus of persuasion.

[76] AER, *Explanatory statement - Rate of Return Guideline*, December 2013, p. 97.

[77] ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.67-71.

increased. Since 2013, we have also received advice about further issues with the DGM and its lack of suitability to reliably track changes in the MRP.[78]

- There are numerous issues surrounding the estimation of dividend growth rates selection and there is a wide variety of potentially acceptable growth rates which could be used in the DGM. With the range of potential growth rates varying from as low as 1 per cent to as high as 5.5 per cent, the DGM based MRP estimate could vary by around 4 per cent purely due to the chosen growth rate.[79] Given this large potential for error in the MRP estimate driven by growth rate selection, our decision must account for the potential error or unsuitability in the estimate. Further, the models tend to produce results that are out of step with each other. As shown in Figure 4, we note that different constructions and application of the DGM produce a wide range of outcomes.
- Surveys reports remain largely unchanged from 2013 and continue to support an MRP estimate between 6 and 6.5 per cent.
- We continue to use three conditioning variables to inform (or 'condition') our initial MRP estimate. These are implied volatility, dividend yields and credit spreads. Our MRP estimate of 6.0 per cent is consistent with the conditioning variables. In particular, the decreased volatility in equity markets and the material reductions in debt risk premiums over the past 5 years.
- Debt risk premiums have declined materially over the past 5 years from around 340 basis points at 1 January 2013 to 189 basis points as at 29 March 2018.

Table 2 Historical excess returns

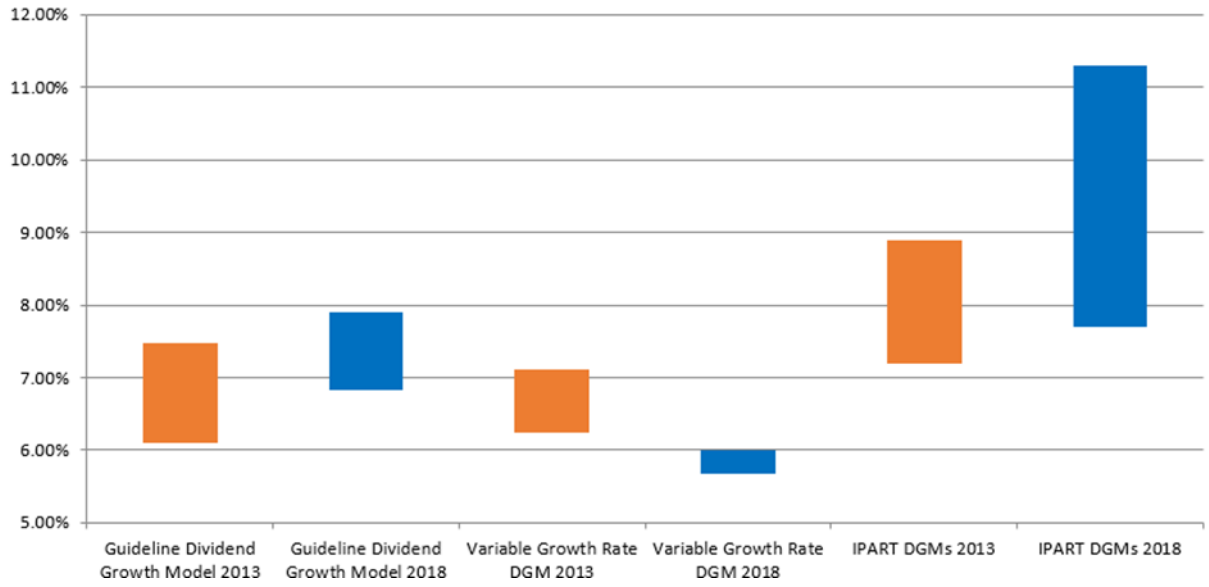
Sampling period	Arithmetic average	Arithmetic average (2013 guideline)	Geometric average	Geometric average (2013 guideline)
1883–2017	6.3	6.3	5.0	4.8
1937–2017	6.0	5.9	4.2	3.9
1958–2017	6.5	6.4	4.2	3.8
1980–2017	6.4	6.3	4.3	3.8
1988–2017	6.0	5.7	4.5	3.6

Source: Handley, An estimate of the historical equity risk premium for the period 1883 to 2011, April 2012, p. 6. AER update for 2012–2017 market data. The 2013 guideline values are taken from data up to December 2012.

[78] Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, 21 May 2018, p.33; Partington and Satchell, Report to the AER: Cost of Equity Issues 2016 Electricity and Gas Determinations , April 2016, pp.27-33; McKenzie & Partington, Report to the AER: Part A, Return on Equity, October 2014, pp.26-41.

[79] Previous DGM results have shown a change in growth rate can have an almost one for one inverse impact on the MRP estimate.

Figure 4 MRP estimates from different constructions of the DGM



Source: AER analysis. Variable growth rate equal to 10 year CGS yield but model construction is otherwise identical to the AER's DGM model, IPART February update

Overall, we consider that our HER estimate of 6.0 is consistent with the easing of risk conditions in Australia since 2013 as shown by the conditioning variables, and with our diminished confidence in the robustness of DGM estimates. A value of 6.0 per cent is more in line with market conditions and market practice.

Equity beta

Our draft decision is an equity beta point estimate of 0.6. This is a reduction from the estimate of 0.7 in our 2013 Guidelines.

We have come to this decision by applying the estimation approach that we set out in our 2013 Guidelines and applied in each subsequent regulatory determination. This approach is based on considering the same relevant classes of evidence that were identified in our 2013 Guidelines, namely:

- Giving most weight to empirical estimates of relevant Australian energy network businesses
- Having regard to:
    - conceptual considerations of the risks of energy network businesses relative to the market portfolio
    - empirical estimates of foreign energy network businesses
    - the theoretical underpinnings of the Black CAPM
    - the value of stability and predictability to industry and consumers

Stakeholders supported continuing the approach of giving most weight to empirical estimates of Australian energy networks businesses, and having regard to the other

classes of evidence when determining a final equity beta estimate from within a range of estimates supported by the empirical analysis.[80] There was also agreement in support of continuing this approach in the expert session.[81]

However, stakeholders expressed divergent views on how we should exercise our judgement when evaluating the relative weight that should be afforded to each class of evidence and ultimately, on the final equity beta value we should choose.

Consumer groups submitted that we were too conservative in selecting a value of 0.7 previously and recommended the value should be 0.6 or lower.[82] The CRG noted:

> A point estimate for equity beta should be closer to 0.4 or lower.[83]

Service providers and the network shareholder group submitted that the equity beta should be at least 0.7 with short term estimates indicating an increase. The NSG submitted:

> Equity beta can be maintained at 0.7 for the RORG period.[84]

Service providers referred to potential low beta bias in empirical estimates (by referencing ex-post studies) and submitted that this supports an uplift beyond the empirical estimates.[85] [86] [87] The ENA submitted that:

> There is no evidence to support a diminution of low beta bias or the role of the Black CAPM within the foundation model approach.[88]

CCP16 disputed this proposition. It did not consider low beta bias to be particularly suitable for estimating ex-ante the equity beta or for 'adjustment' to the empirical data.[89] The CCP16 submitted that:

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80 Cheung Kong Infrastructure, AER Issues Paper – Review of the rate of return guideline, 12 December 2017, pp. 3–4; Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 68, 89.

81 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 23, 28; Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 39.

82 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, p.68; CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 51.

83 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 51.

84 NSG, *Submission on the Rate of Return Guideline review*, p. 13

85 For example, APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.

86 APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 27.

87 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 52.

88 ENA, *Response to Discussion papers and concurrent expert evidence sessions*, May 2018, p.41.

89 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

> There is too much uncertainty around the empirical analysis of the Black CAPM theory for it to play a substantive role in the AER's decisions, and is not generally applied by market practitioners or regulators.[90]

CCP16 also submitted that our empirical estimates overstate the true value of the equity beta because our sample includes firms that undertake unregulated activities that are inherently more risky.[91]

Service providers point to the declining size of our comparator set due to recent de-listings, and urge caution before departing from our current value. [92] They propose the inclusion of international energy firms and other Australian infrastructure firms in the comparator set[93] but the CCP16 opposes this because these firms are 'not particularly relevant to the [risk of providing regulated services]'.[94]

We have regard to these submissions, the expert evidence session and other relevant material in this decision. We form a range then select a point estimate based on our consideration of the relevant evidence, their relative strengths and weaknesses and suitability for our regulatory task.

We rely mostly on empirical estimates because they provide information from firms that are reasonably comparable to firms in the supply of the regulated energy services. We have updated our empirical analysis[95] using the same comparator set as that used in our 2013 Guidelines. Results of this update are set out in

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90 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, p.9.

91 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 37

92 ENA, *Response to Discussion papers and concurrent expert evidence sessions*, May 2018, p.46.

93 Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 31; Cheung Kong Infrastructure, AER Issues Paper – Review of the rate of return guideline, 12 December 2017, p. 5; Jemena, Submission on concurrent expert sessions and discussion papers, 4 May 2018, p. 3; Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46, 62.

94 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 82

95 By including data up to 2 March 2018

Table 3 below. We consider they support a range of 0.4 to 0.8 as all estimates fall within the 0.4–0.8 range except for 1 estimate.

Table 3 Re-levered weekly OLS equity beta estimates

	Average of individual firm estimates	Fixed-weight portfolio estimates						
Portfolio		P1	P2	P3	P4	P5	P6	P7
Firms in portfolio		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
Equal weighted beta estimates								
Longest available period	0.57	0.48	0.50	0.54	0.53	0.43	0.47	0.52
Longest period available (excl. tech boom & GFC)	0.61	0.52	0.51	0.59	0.58	0.50	0.54	0.63
Recent 5 years	0.70	0.71				0.55	0.66	0.79
Value weighted beta estimates								
Longest available period[(a)]	n/a	0.52	0.66	0.47	0.47	0.44	0.49	0.54
Longest period available (excl. tech boom & GFC)	n/a	0.56	0.67	0.55	0.55	0.52	0.57	0.66
Recent 5 years	n/a	0.73				0.53	0.72	0.85

Source: AER analysis; Bloomberg

Note: Our comparator firms include AusNet Services (AST). This firm was included in the 2013 Guideline under its former name of SP Ausnet (SPN). It was renamed in 2014.

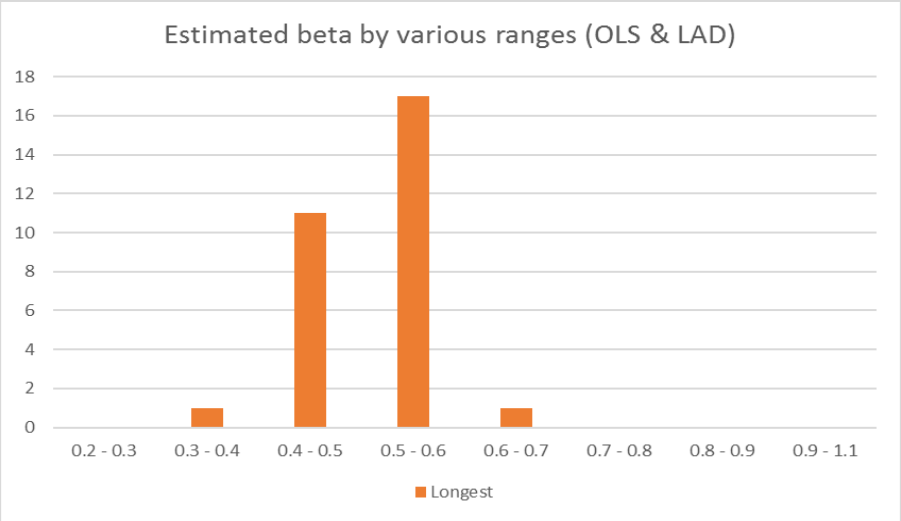
While we acknowledge the small sample, we consider our comparator set of domestic firms is the best empirical guide currently available. This is because international firms and other Australian infrastructure firms carry different risks and characteristics compared to firms in the supply of regulated energy network services. A range of submissions acknowledged that it would be difficult to adjust international firms and other Australian infrastructure firms to make them comparable to firms supplying the regulated energy services.[96] [97] [98] [99] [100] [101] Experts and the ENA have also agreed that domestic comparators are the most relevant and comparable.[102] [103] [104]

[96] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 19

Overall, we consider that an equity beta value of 0.6 will best promote the legislative objectives for the following reasons:

- We give most weight to estimates from the longest estimation period (portfolio level and average of firm level estimates). We consider that short term estimates can be influenced by factors such as one-off events (for example, the Global Financial Crisis), shocks and interest rate movements. These factors can obscure the systematic risk of a firm supplying regulated energy services whose exposure is mitigated by regulation and monopoly nature of the service it provides. Estimates from the longest estimation period cluster in the 0.5–0.6 range (see Figure 25) and the average[105] of re-levered OLS estimates is 0.51.

Figure 5 Distribution of 2018 re-levered weekly beta longest estimation period[106]



Source: AER analysis, Bloomberg

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97 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

98 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 33, 29, 28

99 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 46.

100 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 82

101 Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 15.

102 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 28

103 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 23

104 Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 62.

105 Average of fixed weight portfolio estimates and averaged firm-level estimates.

106 Based on value weighted and equal weighted portfolio estimates and averaged firm estimates.

- The average[107] of weekly re-levered OLS estimates across all periods is 0.57.
- The point estimate of 0.6 (and empirical range of 0.4–0.8) is consistent with our expectation that the equity beta of a firm supplying the regulated energy services will be below 1.0 due to the overall low risk exposure.
- International estimates support an equity beta value of less than 1.0.[108]
- We have had regard to (and further consideration of) the Black CAPM and the potential for low beta bias. However, we agree with the CCP16 that there is uncertainty around empirical analysis of the Black CAPM and it is not generally applied by market practitioners or regulators. Given our diminished confidence, we are not persuaded to select an equity beta towards the top of the observed empirical estimates.

We observe that recent short-term beta estimates have increased since our 2013 analysis:[109]

- The average of firm level estimates have increased since Henry's report with the largest increase for the recent 5 year period (0.459 to 0.70).
- Most portfolio-level estimates rose with the increase being less than 0.05.

However, the overall empirical results (

[107] Average of fixed weight portfolio estimates and averaged firm-level estimates across all three estimation periods (longest, post tech boom excluding GFC and recent 5 years)

[108] The multitude of differences with a supplier of the regulated energy services means that we cannot (reliably) quantify and adjust international estimates to make them comparable to domestic estimates. As a result, they are now used in a qualitative role (similar to conceptual analysis) to indicate if they support a value above or below the market average.

[109] While Professor Henry's report was finalised in 2014, estimates were provided to the AER during 2013 to inform the Rate of Return Guideline review. For example, see: AER, Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return, November 2017, pp. 64–67.

Table 3), particularly the longest estimation period (as seen in Figure 25), support a value of less than 0.7.

We agree with consumer submissions that the inclusion of comparator firms with a high proportion of unregulated activities is likely to result in empirical estimates that are higher than otherwise. This is because the higher level of unregulated activities would increase systematic risk exposure. Of the firms in our sample that are still publicly listed, SKI and AST have a relatively high proportion of regulated revenue while APA has a relatively low proportion. Table 4 compares estimates for SKI and AST against those from the whole comparator set with the following results:

- For the longest estimation period (which we have most regard to), SKI and AST's average firm level estimate is 0.41 and average portfolio estimate of 0.42. These are below estimates from the whole comparator set of 0.57 and 0.5 respectively.
- The average of OLS portfolio estimates and averaged firm estimates for SKI and AST is 0.54 which is below that from the whole comparator set (0.57)

Table 4 Comparison of estimates for listed majority regulated comparators (OLS, weekly)

	Whole comparator set	SKI & AST
Average of firm level estimates		
Longest	0.57	0.41
Post tech boom & excl. GFC	0.61	0.52
Recent 5 years	0.70	0.68
Fixed weight portfolio estimates		
Longest	0.43–0.66	0.42–0.43
Post tech boom & excl. GFC	0.50–0.67	0.52–0.53
Recent 5 years	0.53–0.85	0.68–0.7

Source: AER analysis, Bloomberg

Therefore, we consider the above results support an equity beta of less than 0.7 and indicates potential for a value less than that indicated from the whole comparator set. However, we note the 2013 Guideline estimated a reduced equity beta. The 2013 Guidelines estimated an equity beta of 0.7, down from 0.8 estimated in previous determinations, even though longer term estimates were clustered materially below 0.7. In part, we took into account the need to promote stability and predictability and therefore decided not to make a larger change. We adopt similar considerations in this decision and consider a further reduction at this time will provide an estimate that is more in line with empirical estimates and so we have reduced the equity beta by 0.1.

We have considered whether we should employ a different value between gas and electricity businesses. Gas businesses submitted that they are subject to greater risk.

Overall, we conclude that systematic risks between gas and electricity networks are sufficiently similar to warrant a common equity beta.

Return on equity point estimate

Under the 'Return on equity' heading above we outlined our 6-step foundation model approach to estimating the return on equity. Steps 4-6 of this approach are where we bring together the information from step 3, have regard to other information (step 4), and then determine the final return on our equity point estimate (sometimes referred to as 'cross checks').

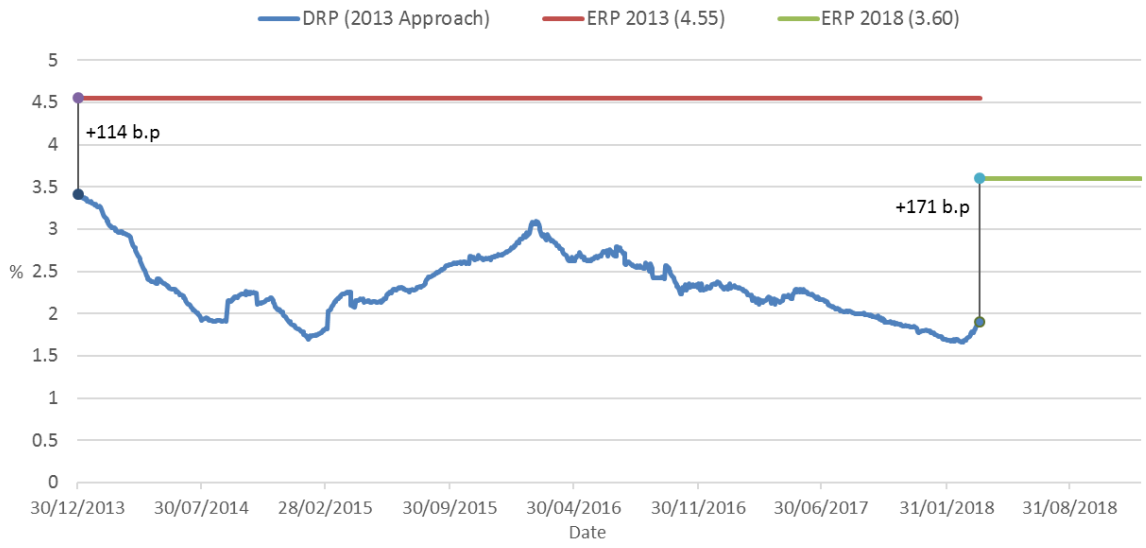
Our evaluation of the other information that plays a role in informing the overall return on equity (set out in table table) leads us to consider that on the whole they support our foundation model estimate of an equity risk premium (ERP) of 360 basis points. We consider the debt risk premium (DRP)[110] to be a valuable relative indicator of the reasonableness of our ERP. This is because we do not expect the return on equity for a benchmark efficient entity with similar degree of risk as a relevant service provider in the provision of regulated energy services to be significantly higher than the return on debt. Figure 6 shows the comparative and relative positions the equity and debt risk premia.

When we finalised our 2013 Guideline the debt risk premium was about 340 basis points (based on the simple average of the RBA and BVAL curves). There has been a material reduction in the DRP since and it is currently around 190 basis points.[111] In 2013 our ERP was approximately 115 basis points above the DRP. Comparatively, our ERP for this decision is approximately 170 basis points above the DRP. This gives us confidence that service providers, relative to the margin at the start of the 2013 Guideline, have a reasonable opportunity to recover at least their efficient costs of equity over the life of the 2018 Guideline.

[110] Spread between BBB+ rated corporate debt and the risk free rate.

[111] As at 29 March 2018.

Figure 6 Comparison of ERP to debt risk premium



Source: AER analysis. The 2013 Guideline estimated the return on debt (and DRP) as a simple average of BBB bond yields from RBA and Bloomberg BVAL data. Updated to 29 March 2018.

We consider that the output of an ERP of 360 basis points from our foundation model SLCAPM using relevant market data is an efficient forward-looking return for risk. Our consideration of 'cross checks' does not lead us to adjust the SLCAPM output. We are satisfied that the ERP of 360 basis points coupled with a risk free rate observed at the time of applying the guideline will achieve the legislative objectives.

Overall approach to estimating the return on debt

Our draft decision is to continue to adopt key elements of our current approach for estimating the return on debt. That is, we will continue to adopt:

- A benchmarking approach based on data from third party data providers and benchmarks for term of debt and credit rating.
- A 10-year trailing average approach with an annual update.
- A 10-year transition from the previous 'on-the-day' to the 10-year trailing average approach. For clarity, our draft decision is to adopt a consistent transition approach across all networks. Where we have commenced the transition in a previous determination for a service provider, we will continue that transition.

These aspects of the approach to estimating debt continue our current approach, which has been affirmed by the Australian Competition Tribunal.[112]

The majority of stakeholders also continue to support the adoption of a trailing average approach with a transitioning arrangement. [113]

In contrast, the Network Shareholder Group, ATCO Gas Australia, and NT Power & Water Corporation have indicated preference for an immediate adoption of the trailing average, rather than with transitioning.

Having regard to the evidence before us, the key reasons for our decision are that:

- our reasons for use of a 10 year-trailing average and a 10-year transition to that trailing average have been scrutinised in detail and applied in all decisions made since the current 2013 guidelines, and upheld in appeals before the Australian Competition Tribunal and the Full Federal Court. In our view, the reasons for adopting this combination of approaches remain valid.
- maintaining our current approach provides the necessary certainty and predictability of regulatory arrangements that stakeholders have said they value whilst allowing us to conduct our regulatory task in a manner that is most likely to contribute to the legislative objectives.
- removing the transitioning arrangement will not achieve the national gas and electricity objectives. If we do not employ the transition then the change in methodology would not be revenue neutral and would generate windfall gains or losses depending on how interest rates have moved.

The choice of third party data providers

Through our 2013 guideline and subsequent determinations we decided to source debt data from the RBA and Bloomberg. Since then we have become aware of two additional data sources: Thomson Reuters and S&P Global. For our 2018 guideline our decision is to continue to source data from RBA and Bloomberg and to also source data from Thomson Reuters. We will not use data from S&P Global at this point in time.

Based on evaluation of available information on the curve methodologies, all four curves have strengths and weaknesses and none is clearly superior with respect to either the bond selection criteria or curve fitting methodology. Overall, there is a substantial overlap between the curves in terms of bond selection criteria, though each curve has distinctive characteristics.

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[112] See: Australian Competition Tribunal, Application by ActewAGL Distribution [2017] ACompT 2, October 2017.

[113] Australian Pipelines and Gas Association, Submission to the Issues Paper, December 2017, p4 – 6; Energy Networks Australia, AER Rate of Return Guideline, December 2017, p16-17, p19-20; Ergon Energy and Energex, Issues paper – review of the rate of return guidelines, December 2017, p4-5; Major Energy Users, Review of the rate of return guidelines, December 2017, p10-11, 15; APA, APA submission responding to AER issues paper, December 2017, p8; Cheung Kong Infrastructure, Submission on rate of return issues paper, December 2017, p3,

In general, our view is that consideration of data providers' methodologies is the most important criteria on which to base our decision on the choice of data series. However, in this case, the S&P Global's Australian-dollar-denominated curves produce outcomes which are materially different to the other curve providers and to our expectations: [114]

- Over the data series we have available, the S&P Global broad-A and broad-BBB curves produce very similar results where we would expect a more material difference. In contrast, the BVAL, RBA and Thomson Reuters curves as well as S&P Global's US-dollar-denominated curves exhibit a more material difference.
- For the majority of the period since December 2013, the S&P Global Australian-dollar-denominated broad-BBB yield curve produce yields estimates below the 'A' rated curves from the other curve providers.

We recognise that there may be valid drivers of the differences between curve estimates. However, disaggregation of the drivers of these differences is complex due to the proprietary nature of curve estimation and we have not been able to reconcile the differences at this time.

Stakeholder submissions generally supported continued reliance on the Bloomberg and RBA curves but there were mixed views on:

- Whether to include the Thomson Reuters or S&P Global curves—some consumer groups supported inclusion of the new curves, networks and investors submitted that we should maintain the current approach
- What weight to put on the curves—for example, some consumer groups proposed we should give greater weight to the RBA curve compared to the other curves.

Having regard to the available evidence, we consider none of the three curve providers is clearly superior. With respect to the fitness of purpose of the four curves for this application, we agree with the MEU's summary that:[115]

- While the AER seeks views on the appropriateness of the four different sources of data, it also highlights that all four series have failings to a greater or lesser extent.
- This implies that to overcome these shortcomings, some degree of combination of the data series is not only appropriate but necessary.

Our view is that the combined use of the RBA, Bloomberg and Thomson Reuters curves will contribute to achievement of the NEO and NGO to the greatest degree. Our key reasons for this view are:

- On the bond selection criteria (including approach for identifying outliers) and curve fitting (or averaging) methodologies, we consider that the approaches employed by

[114] To assist in our analysis, S&P Global has kindly provided us with a longer historical time series of monthly data than is currently publicly available. We have had regard to this analysis in reaching our decision.

[115] Major Energy Users, *Estimating the allowed return on debt—Discussion paper*, May 2018, p. 4.

the RBA, Bloomberg and Thomson Reuters have their unique strengths and weaknesses, but we are not satisfied that any curve is clearly superior.

- All of the curves from all three 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.
- In our view, applying equal weight to each of the three data providers is intuitively reasonable and the process of developing a more sophisticated weighting scheme would rely on contentious assumptions. In our view, there is no persuasive evidence that the likely difference in average from different weighting schemes will be material over time.
- An average of the three data providers reduces the impact of movements in any one of the individual curves. This will reduce potential volatility. Further, the use of three data providers incorporates a natural contingency in the event that one of the data providers ceases publication.

The benchmark credit rating

Our draft decision is to adopt a benchmark credit rating of BBB+, consistent with our 2013 Guidelines and 2009 review of WACC parameters. We consider this is consistent with the available empirical evidence.

Stakeholders submitted a range of views about benchmark credit rating. Service providers and investors generally supported use of a BBB+ benchmark credit rating. The ENA supported the use of a BBB+ benchmark credit rating but submitted this would be at the lower end of the range of observed credit ratings. Some customers and retailers submitted we should adopt a higher (A- or A) credit rating.

We note that the service providers within the sample we analysed have generally maintained stable credit ratings over an extended period including the period affected by the GFC and maintained investment grade credit ratings (between BBB– and A–). The table below shows the historical median credit rating for Australian service providers from 2006 to 2017.

Table 5 Median credit ratings over time

Issuer	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Industry median	BBB/ BBB+	BBB/ BBB+	BBB+	BBB	BBB	BBB	BBB	BBB/ BBB+	BBB+	BBB+	BBB+	BBB+

Source: Bloomberg (S&P Global), AER analysis

Whilst the above table shows that the median credit rating has moved between BBB and BBB+, the four most recent years of data support a rating of BBB+. We consider that this recent concentration of ratings at BBB+ provides sufficient evidence that this is the appropriate benchmark credit rating.

Implementation of the benchmark credit rating

We will implement the BBB+ benchmark credit rating using a weighted average of:

- 2/3 weighting on broad-BBB curve estimates
- 1/3 weighting on broad-A curve estimates.

This is a departure from our current approach where we have relied on a broad-BBB curve only.

Ideally, we would estimate the return on debt for a benchmark BBB+ rated entity using third party yield curves for specific BBB+ rated bonds. However, due to the relatively small sample of Australian dollar (AUD)-denominated debt from which third party curve providers can develop their estimates, we rely on 'broad' credit rating band estimates which include several credit rating bands within a curve:

- A 'broad-BBB' curve typically includes BBB-, BBB and BBB+ rated debt
- A 'broad-A' curve typically includes A-, A and A+ rated debt.

The CRG summarised this issue as follows:[116]

> It is clear that using a broad-BBB series will over-estimate the allowed return on debt that will be provided to a business with a BBB+ credit rating. This becomes even more egregious when it is realised that the relationship between credit rating and interest rate is not exact and that regulated networks benefit from slightly lower rates than other BBB+ businesses.
>
> Using a broad-A series and averaging it with the broad-B series is one useful approach, and the CRG would support this approach.

Consumer and other stakeholders submitted a range of different views on this proposed approach:

- CCP16 supported the adoption of a 2/3 broad-BBB: 1/3 broad-A average
- The MEU submitted that the benchmark credit rating should be raised from BBB+ to A- or A which would require a different curve mix.
- Energy Australia recommended a 'tiered' benchmark credit rating of A- and BBB.
- While the CRG submission supported the approach, it observed that the proposed 2/3:1/3 average only partially closes the gap between AER approach and actual spreads.

In contrast, networks and investors:

- Submitted that the evidence does not support a change from the use of broad-BBB curves only

[116] Consumer reference group, Estimating the allowed return on debt—Response to discussion paper, May 2018, pp. 3–4.

- Raised a series of methodological concerns with our analysis of actual debt instruments raised by service providers and with our 'matched-term spreads' analysis
- Submitted that long-dated debt that make up Bloomberg's broad BBB curve has historically been more heavily weighted towards BBB+ bonds

Having regard to the submissions and the evidence available to us, we consider a 2/3 broad-BBB: 1/3 broad-A average will better estimate the required return on debt for a BBB+ rated entity.

Our key reasons for this view are as follows. Firstly, we consider the use of a 'broad-BBB' series alone will, other things held constant, overestimate the return on debt required for a BBB+ rated entity. In regulatory determinations made after the 2013 Guidelines we acknowledged that reliance on a broad-BBB curve only is likely to overestimate the yields for a BBB+ benchmark.[117] This is because, to the extent that credit ratings are an informative measure of credit risk, we expect:

- reliance on a broad-BBB curve is likely to overestimate the level of credit risk (and ultimately the required yields) of a BBB+ benchmark credit rating− because the benchmark credit rating (BBB+) is the highest rating band amongst the constituents, the inclusion of any of the lower rated bonds in the sample (BBB or BBB-) would, other things held constant, overestimate the required return on debt for the benchmark credit rating
- reliance on a broad-A curve only would underestimate the level of credit risk (and ultimately the required yields) for a BBB+ benchmark credit rating because all constituents (A- ,A ,A+) are higher rated than the BBB+ benchmark credit rating
- some combination of broad-BBB and broad-A curves should therefore provide the best fit to a BBB+ benchmark credit rating. As a conceptual expectation, our view is that a 2/3 broad-BBB: 1/3 broad A rating is most likely to match a BBB+ benchmark credit rating.

Secondly, our analysis of actual debt instruments raised by service providers compared to our current approach suggests that:

- When term and date of issuance are controlled, the use of broad-BBB curves has, over 2013–17, overestimated by approximately 29 basis points the spreads at which service providers have issued debt
- When term and date of issuance are controlled, a weighted average of 2/3 broad-BBB : 1/3-broad A curves has, over 2013–17, overestimated by approximately 9 basis points the spreads at which service providers have issued debt

We therefore conclude, that a 2/3 broad-BBB : 1/3 broad-A estimate is a better match for our benchmark credit rating of BBB+. This is supported conceptually and by our

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[117] See for example: AER, *Final determination— AusNet Services transmission determination 2017-2022— Attachment 3: Rate of return*, April 2017, p. 340

analysis of debt issuances over the past 5 years. Based on current market observations using a combination of broad A and BBB curves from Bloomberg, the RBA and Thomson Reuters will reduce our estimate of the benchmark return on debt by roughly 10 basis points compared to using a broad BBB curve only.[118]

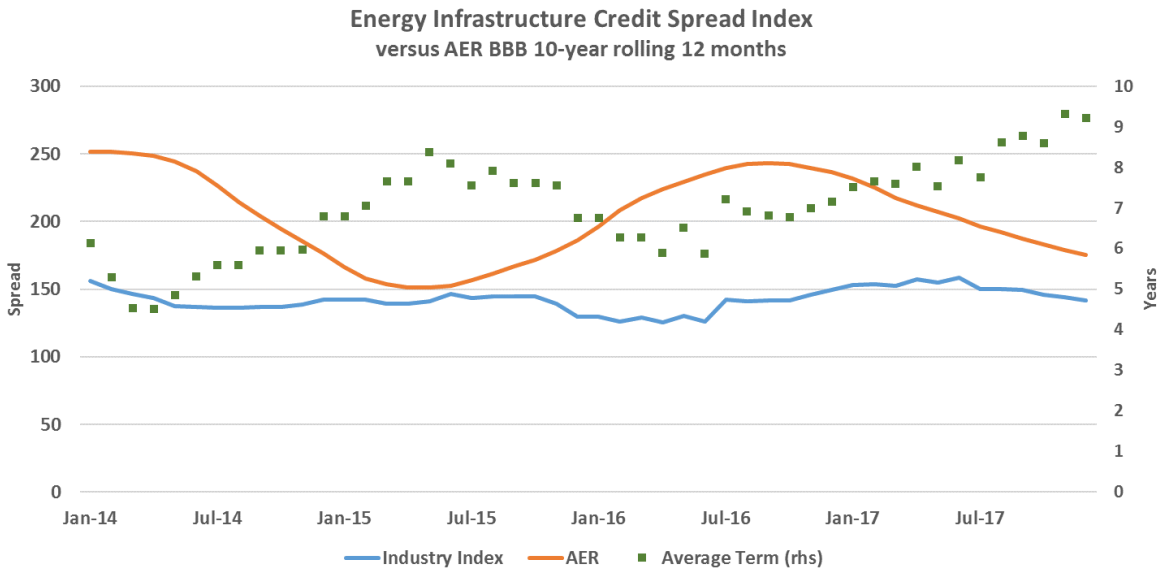
Benchmark term

Our benchmark term of debt for these Guidelines is 10 years. This is consistent with the benchmark term of debt in the 2013 Guidelines and the 2009 statement of regulatory intent.

In reaching our view on the benchmark term of debt, we have had regard to information on actual debt instruments collected from the majority of privately owned service providers that we regulate. This information is commercially sensitive, and we engaged Chairmont to assist us with aggregation of this data. We have held individual discussions in confidence with service providers who provided data, and these discussions have informed our conclusions.

We published a discussion paper setting out the results of our analysis and Chairmont's report. Our analysis of debt instruments issued over the past 5 years yielded an average term at issuance of 7.5 years for all instruments included in our sample. Figure 7 illustrates a series of term at issuance where each point in time is an average of debt within the EICSI sample that has been issued in the preceding 12 months, and its relationships with the average spreads for the same instruments.

Figure 7 Spreads to swap on actual debt instruments in the EICSI sample compared to spreads to swap using the AER approach



[118] Specifically, we have calculated this estimate over all business days in February 2018.

Source: AER analysis, Chairmont spreadsheet.

Note: This figure uses Chairmont's initial EICSI spreadsheet, but the AER series is updated to include the RBA's June 2018 revisions to its F3 statistical table.

CCP16 noted the evidence that networks on average are issuing debt with a shorter term than 10 years, but did not recommend a change to our 10 year term:[119]

> Clearly, there is a strong argument that the adoption of a benchmark term of 10 years contributes to a conservative (i.e. overestimate) ROD. The question of what to do about this is more complex and difficult. The primary difficulty is the uncertainty and complexity of changing the term while most utilities are in the process of adjusting their debt portfolios as part of transitioning to the trailing average of 10-years. Given the extensive analysis and debate (and administrative and judicial reviews) we would not propose that the AER change its current approach to better approximate a benchmark term based on the actual behaviour of the NSPs as part of the new Guideline – although we would not rule it out as a suitable approach beyond the transition period.

In response to our discussion paper, networks and investors submitted a series of reasons in support of maintaining the 10-year term, including:

- that the 10-year transition to the trailing average return on debt implies a level of regulatory commitment to the approach over a number of regulatory periods
- that there remains a conceptual basis to expect networks to issue longer term debt to match the lives of their assets
- a series of contextual factors such as implementation of the transition and the privatisation of networks within the sample suggesting that the past 5 year sample may not reflect 'business as usual' with respect to the term of debt issuance.
- the use of a simple average of term on issued debt over 2013–17 is not sufficiently robust to support a change of term.

Consumers and retailers submitted a range of different views:

- CCP16 and the CRG pointed to evidence of shorter term issuance over the past 5 years but did not recommend a departure from a 10 year benchmark due to the uncertainty and complexity of changing the term while utilities are in the process of responding to the transition to a trailing average approach.
- Some consumer groups submitted that even a 7.5 year benchmark term to maturity may overstate the required return on debt
- Some consumer groups recommended that our return on debt should be based on the average observed spreads of debt in our sample. This would not require an estimate of the benchmark term.

[119] CCP sub-panel 16, Submission to the AER on its allowed rate of return on debt discussion paper, May 2018,

- Energy Australia recommended the reduction of the benchmark term of debt to 7.5 years

Having regard to these submissions and the evidence available to us, we consider the benchmark 10 year term remains appropriate. Our key reasons for this view are that:

- We consider that a business will, within the constraints of the market for corporate bonds, aim to match the length of the debt term to the asset life in order to minimise refinancing risk. We note, however, that this is subject to consideration of the increased cost of debt associated with a longer term.
- Consideration of service providers' actual debt raising practices and relevant market circumstances over 2013–17 does not reveal clear conclusions:
    - Over the period for which we have collected actual debt data (2013-17) we have implemented a transition to the trailing average return on debt approach. This is was a material change to the return on debt approach, and we expect it would have impacted debt raising practices to some extent. Based on the data available to us, it is unclear whether or not the observed debt issuance patterns are temporary / cyclical or a transient adjustment in response to our transition to a trailing average approach.
    - A simple average estimate of terms at issuance within the sample of collected actual debt data suggests an average term of 7.4 years. However, we agree with the view expressed by service providers that a simple average across instruments in the sample may understate the 'true' benchmark term of debt.

Nonetheless, we consider empirical evidence to inform the benchmark term of debt is important. As the transition progresses, some of these complexities and uncertainties in the current data may resolve. Accordingly, we will continue to collect actual return on debt information for consideration in future guideline reviews.

Value of imputation credits

Our estimate of the value of imputation credits for this draft instrument is 0.5 selected from a range of 0.3 to 0.6.

Our estimate of 0.5 is rounded to one decimal place from an estimate of 0.53.

The 0.53 estimate is based on the product of an utilisation rate of 0.6 (the proportion of imputation credits paid out by the benchmark efficient entity (BEE) we estimated that would be utilised) multiplied by a distribution rate of 0.88 (our estimate of the proportion of imputation credits created by the BEE that would be distributed).[120]

Our approach, including rounding to one decimal place, is consistent with the approach set out in the 2013 Guideline.

[120] The term 'distribution rate' is used interchangeably with 'payout ratio' in AER and other parties different documents.

We have carefully considered all submissions and information before us in reaching our draft instrument value of 0.50.

Our 'utilisation' approach to the 'Value' of the imputation credits

In Australia, we operate under an imputation tax system. This means that shareholders can receive an imputation credit for income tax paid at the company level. For eligible shareholders, this credit can either offset their Australian income tax liabilities or be used to obtain a refund from the tax office. Thus, shareholders in Australia factor in three income streams when considering investments: capital gains; dividends; and imputation credits. The National Electricity Rules/National Gas Rules (NER/NGR) recognises that a service provider's allowed revenue does not need to include the value of imputation credits. We reflect this third income stream by discounting the tax allowance we provide to service providers by a factor represented by the Greek letter, γ, 'gamma'. Our regulatory framework employs a vanilla WACC which is a pre-personal costs, pre-personal tax model based on the work of Officer.[121]

We interpret the value of imputation credits as an estimate of the proportion of company tax which is expected to be returned to investors through utilisation of imputation credits. That is, we apply a 'utilisation' approach to estimating the post company tax value of imputation credits. This is consistent with our approach for estimating the 'value' of imputation credits proposed in the 2013 Guideline and applied in all regulatory determinations since then.

Our current 'utilisation' approach to determining the value of imputation credits has been found open to us in four recent legal cases including two Full Federal Court cases.[122]

The utilisation approach to valuing imputation credits has also been extensively considered in submissions we have received and in the discussions at the expert session. Consumers generally support the approach. For example, CCP16 generally supported the overall conceptual framework in which the AER assessed the value of imputation credits (gamma). CCP16 contended that the decision of the Full Federal Court in May 2017 settled the question on the 'value of imputation credits'.[123] While industry generally does not agree with the AER's 'utilisation' approach, they appear to accept this approach is legally open to the AER and the AER is likely to use it in making this Guideline. The Joint Energy Networks submitted that the utilisation rate approach to gamma is not being challenged as part of this Guideline review.[124]

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121 R. Officer, *The cost of capital of a company under an imputation tax system'*, Accounting and finance, May 1994, vol. 34(1), p. 4

122 Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal* (No 2) [2017] FCAFC 79, May 2017; Federal Court of Australia, SA Power Networks v Australian Competition Tribunal (No 2) [2018] FCAFC 3, Jan 2018, para. 56; Australian Competition Tribunal, *Application by SA Power Networks [2016] ACompT 11*, 28 October 2016; Australian Competition Tribunal, *Application by ActewAGL Distribution [2017] ACompT 2*, 17 October 2017

123 Consumer Challenge Panel 16 - *Submission on Rate of Return Guideline Review - 4 May 2018*. page 120

124 Joint Energy Networks - *Submission on Rate of Return Guideline Review* - 4 May 2018 page 6

Key reasons for choosing 0.5 in this draft decision

A value of 0.5 is an increase from the value of 0.4 applied in all determinations released since the 2013 Guideline. The increase is driven by updated information and our exercise of judgement in light of this information. Key drivers of the increase include:

- Giving primary weight to Lally's updated estimate of the distribution rate from the top 20 Australian Stock Exchange (ASX) listed firms
- Placing significant reliance upon an estimate of the utilisation rate for 'all equity' (that is data reflecting the ownership of both listed and unlisted Australian equity) from updated ABS equity ownership data

While most stakeholders have accepted our current 'utilisation' interpretation of the value of imputation credits, some stakeholders proposed that the AER should review its overall approach. In particular, the CRG proposed criteria we should employ including: [125]

> An assumption that the utilisation rate of imputation credits (Θ) is 100 per cent. That is, the firms are using the most efficient source of finance, that being Australian investors entitled to make use of imputation credits,
>
> A distribution rate in line with what an efficiently financed form would be expected to distribute, based on the value of the RAB, depreciation and any necessary new investment in the RAB.

A number of stakeholders also proposed that the utilisation rate from the equity ownership approach which uses the ABS equity ownership data is not consistent with the capital asset pricing model (CAPM). Nevertheless, the key issues raised have been around the composition of the empirical evidence and the relative weights to be placed on the different empirical evidence in coming to an estimate for the value of imputation credits.

Some service providers have proposed we use a simple overall national gamma estimate based on ATO data. The Joint Energy Networks submitted:[126]

> ATO tax statistics provide a direct estimate of the proportion of company tax paid by the average firm that is returned to its investors through utilization of imputation credits. The items in the ATO data base required for this estimate are reliable and robust and give rise to an estimate for gamma of 0.34.

However, we do not consider an estimate based on this ATO data supports a value of less than 0.5. This is because it reflects a national average imputation credit distribution rate which we consider is below the efficient distribution rate. Once adjusted for the difference in the distribution rate the ATO data supports a gamma

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[125] Consumer Reference Group - *Submission on Rate of Return Guideline Review* - 4 May 2018 page 59

[126] Joint Energy Networks - *Submission on Rate of Return Guideline Review* - 4 May 2018 page 6.

value of 0.5. We also note the ATO has advised us the taxation statistics data should be treated with caution.

The key reasons for choosing an utilisation rate of 0.6

The utilisation rate is the proportion of distributed imputation credits utilised and it is reasonable to expect the majority of eligible shareholders will utilise imputation credits. Given this, the key data we use for estimating the utilisation rate is ABS equity Australian ownership data for 'all equity'. This is also consistent with theoretical models, that the value for the utilisation rate is consistent across firms in the Australian economy.

ABS equity ownership data indicates Australian ownership of Australian equities of somewhere between 60 and 70 percent over recent years and a current Australian ownership rate of around 65 percent. This supports our estimated utilisation rate of 60 per cent given we expect nearly all eligible shareholders to utilise imputation credits distributed to them.

In addition, after adjusting for the higher expected distribution of the BEE than the average corporate firm in Australia, the ATO taxations statistics data also appears to support an utilisation rate of around 60 per cent.

Distribution rate / payout ratio

We have placed primary weight on the estimated distribution rate from the top 20 ASX listed firms from 2001 to end 2017. This has been estimated from audited financial reports by Martin Lally and the analysis has largely been replicated by AER staff. We consider a distribution rate from large listed firms in Australia an appropriate benchmark distribution rate. Considering listed firms is also consistent with our equity beta estimates we place primary weight on taken from Australian listed firms. We consider the top 20 ASX listed firms provide a more accurate picture of a benchmark efficient entity relative to the alternative, as proposed by some, of using a national economy wide measure. Lally also advised us that as most of the regulated firms are either listed or owned by listed firms, a distribution rate from listed equity would be appropriate for the benchmark efficient entity. In comparison to an estimate of the distribution rate from the top 20 ASX listed firms, an economy wide measure inclusive of unlisted firms is likely to have a materially lower average distribution rate due to owners of unlisted firms seeking to avoid taxation at high marginal (personal) tax rates through not distributing earnings.

The estimated distribution rate of the top 20 ASX listed firms from 2000 to 2017 is 0.88. This supports a distribution rate for the BEE of at least 0.88. We consider an efficient service provider[127] could be expected to be able to maintain a distribution rate of 88 per cent if it elected to do so. We have used 0.83 to be internally consistent with our rounded gamma value of 0.5 and our utilisation rate of 0.60.

Our approach to estimating the distribution rate is a change relative to determinations made since the 2013 Guideline, where we primarily used estimates of the distribution rate based on ATO franking account balance data. We also considered distribution rates from both all equity and only listed equity in these determinations. We now consider an estimate of the distribution rate for listed equity a better benchmark than one for all equity. We also consider audited data from financial reports of the top 20 ASX listed firms superior than estimates based on ATO Franking account balance (FAB) data for listed equity.

The ENA submitted that issues with ATO FAB data identified by the ATO materially impact Lally's estimate of the top 20 ASX firms. This is not correct for several reasons. Firstly, as the top 20 ASX firms Lally examines are constant through time his analysis does not suffer from the material entry and exit problems associated with the use of the ATO FAB data over time (where firms may liquidate for example). Secondly, the data Lally uses is from audited financial accounts and therefore should not suffer from the same potential reliability issues associated with ATO informational reporting data (ATO aggregate FAB data is based on information data not used to calculated tax owing). The raw audited data from financial reports also has the advantage of being largely publicly available and therefore the estimate is replicable and transparent.

[127] With a similar degree of risk as that which is involved in providing regulated services.

The CCP and Major Energy Users submitted that the actual tax paid by networks is far under the amount of tax assumed by the AER and a value of imputation credits of 0.4 is too conservative and needs to be increased.

Overall, having considered all submissions and other information before us, we consider the most recent and best available data supports an increase in our estimate of the distribution rate to 0.88. However, as noted above, we have used an estimate of 0.83 to be consistent with a rounded value for gamma of 0.50.

2 How the guidelines contribute to the legislative objectives

There are three key limbs to the legislative objectives that set out how we must decide on the allowed rate of return:

- The national gas and electricity objectives
- The revenue and pricing principles, and
- The allowed rate of return objective.

In performing or exercising an economic regulatory function or power, we must do so in a manner that will or is likely to contribute to the national gas and electricity objectives.[128] The National Electricity Objective (NEO) and the National Gas Objective (NGO) establish the ultimate objective of our decision-making.[129]

In support of the NEO and NGO, the National Electricity Law (NEL) and National Gas Law (NGL) set out Revenue and Pricing Principles (RPPs). [130] These principles underlie the achievement of the NEO and NGO and we have had particular regard to these principles, set out in

[128] NEL, s. 16(1)(a); NGL, s. 23.
[129] NEL, s. 7; NGL, s. 23.
[130] NEL, s. 7A; NGL, s. 24.

Table 6 below, in making our Draft Decision.

In addition to meeting the legislative obligations to achieve the NEO or NGO, and having regard to the RPPs, the National Gas Rules and National Electricity Rules also establish an allowed rate of return objective.[131] That objective provides that the allowed rate of return is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of its regulated services.[132] This objective needs to be interpreted consistently with the overall NEO and NGO, and the principles set out in the RPPs.

There are certain common repeated concepts within these legislative objectives and principles that are particularly relevant to setting the rate of return and the value of imputation credits:

- Benchmarking and incentive regulation
- Efficiency, which we consider relates to two important concepts:
    - The NPV=0 condition
    - Market cost of capital
- Return commensurate with risk of providing regulated services

Section 2.1 sets out how the legislative objectives establish these common repeated concepts for the rate of return.

We adopt standard, well established regulatory economic approaches to our understanding of each these concepts.[133] Sections 2.2 sets out our consideration of these concepts for the allowed rate of return. Section 2.4 provides further detailed consideration of risk and return, and how our consideration of this concept shapes our determination of the allowed rate of return and value of imputation credits.

2.1 Key concepts in the legislative objectives

In this section we provide further consideration of the:

- national gas and electricity objectives,
- revenue and pricing principles, and
- allowed rate of return objective

in respect of the allowed rate of return.

2.1.1 National gas and electricity objectives

[131] NER cll. 6.5.2(b), 6.5.2(c), 6A.6.2(b), 6A.6.2(c); NGR r. 87(2) and r.87(3).

[132] The allowed rate of return objective is discussed in more detail in 2.1.3.

[133] See AER, *Risk and judgement Discussion paper*, February 2018.

The national gas objective and the electricity objective are broadly comparable, and they state:

> National gas objective
>
> The objective of this Law is to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas;
>
> National electricity objective
>
> The objective of this Law is to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to—
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system.

We achieve the national gas and electricity objectives through the combined application of all of our regulatory mechanisms, among which the rate of return is an important aspect. The rate of return provides a service provider with a return on capital that is sufficient for the service provider to efficiently raise the capital required to fund efficient investment in its network. The focus of the rate of return is therefore in promoting efficient investment in the network used to provide electricity and natural gas services.

Benchmarking and incentive regulation are important drivers of efficient investment, operation and use of the network. Our regulatory framework employs a benchmark or incentive regulation approach to determining the allowed rate of return contributes our ex ante determination of revenue allowances.

The combination of our expenditure incentive schemes and our service performance incentive scheme provide balanced incentives for efficiency with respect to price and quality of service (including safety, reliability, and security of supply).

Therefore, we consider that the key concept in the national gas and electricity objectives for the allowed rate of return is efficiency.

2.1.2 Revenue and pricing principles

There are six revenue and pricing principles, which are discussed in the table below.

Table 6 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 cash flow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and there is just enough cash flow left over to cover investors' required return on the capital invested. 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. We note that this principle refers to the efficient costs of providing regulated services, and that 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 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 the use of 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 have regard to 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 cash flow 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 over investment by a regulated network service provider in the relevant system	A rate of return that is too high may encourage over investment, while a rate of return that is too low may encourage under investment. Over-investment may not be in the long-term interests of consumers with respect to price. Under-investment 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 over-investment and over-utilisation may be a result of under-investment. A rate of return that is too high may encourage over investment and a rate of return that is too low may encourage under investment.

Source: NEL, NGL, AER analysis.

2.1.3 Allowed rate of return objective

The allowed rate of return objective provides that the allowed rate of return is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of its regulated services.[134]

This objective requires consideration of the following concepts that common across the national gas and electricity objectives and the revenue and pricing principles:

- Efficient financing costs
- Benchmarking and incentive regulation
- Return commensurate with risk of providing regulated services

2.2 Benchmark efficiency

Economists typically think of efficiency in three dimensions: productive, allocative and dynamic. Table 7 sets out how this applies in the context of the rate of return.

Table 7 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 required 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 investment incentives. We can encourage dynamic efficiency by setting an allowance that does not distort investment 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.

[134] NER cll. 6.5.2(c), 6A.6.2(c); NGR r.87(3).

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.

2.2.1 Benchmarking and incentive regulation

We apply a benchmark approach and an incentive regulatory framework. We estimate a benchmark rate of return which is then applied to a specific service provider, rather than determining the returns of a specific service provider based on all of its specific circumstances.[135]

The service providers' actual returns could differ from those of the benchmark regulatory allowance depending on how efficiently it 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) service providers to retain (fund) any additional income (costs) from outperforming (underperforming) the efficient benchmark.[136]

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

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

Table 8 below outlines how we have applied benchmarking and incentive regulation in coming to our draft decision.

Table 8 Use of benchmarking in our allowed rate of return

Element	Application of benchmarking
Gearing ratio	We determine a benchmark gearing ratio from observed gearing ratios of listed Australian energy networks.
Return on equity	The return on equity is benchmarked against market rates via the SLCAPM. The base rate is benchmarked against yields on CGS. The risk premium is benchmarked against the historical returns on the All Ordinaries and the observed equity beta of listed Australia energy networks.
Return on debt - credit rating	We determine a benchmark credit rating that is used in selecting the yield curve benchmark for the return on debt. Our benchmark credit rating is derived from observed credit ratings of privately-owned Australian energy network firms.
Return on debt - term	We determine a benchmark debt term that is used in selecting the yield curve benchmark, and making adjustments to published yields, for the return on debt. Our benchmark debt term is derived from conceptual analysis and observed term of debt issuances of privately owned service providers.
Return on debt - yield	The return on debt is estimated from benchmark yield curves for a given benchmark credit rating and term. This means that the return on debt is benchmarked against market yields on Australian corporate bonds.
Imputation credits - utilisation rate	We consider the utilisation rate is and economy-wide parameter, and accordingly our benchmark utilisation rate is derived from the ABS equity ownership statistics for all Australian equity.
Imputation credits - distribution rate	We consider the distribution rate is an industry-specific parameter. Our benchmark distribution rates is derived from the observed distribution rates of listed Australian equity.

2.2.2 The NPV=0 condition

As the regulatory regime is ex-ante[137], we consider a rate of return that meets the objectives must provide ex-ante compensation for efficient financing costs. This return would give a benchmark efficient entity a reasonable opportunity to recover at least its efficient financing costs. This is a zero net present value (NPV) investment condition, which is described as follows:[138]

[137] 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*.

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

> The zero NPV investment criterion has two important properties. First, a zero NPV investment means that the ex-ante expectation is that over the life of the investment the expected cash flow from the investment meets all the operating expenditure and corporate taxes, repays the capital invested and there is just enough cash flow left over to cover investors' required return on the capital invested. Second, by definition a zero NPV investment is expected to generate no economic rents. Thus, ex-ante no economic rents are expected to be extracted as a consequence of market power. The incentive for investment is just right, encouraging neither too much investment, nor too little.

During the first concurrent evidence session, the experts agreed that setting an allowed return to achieve a zero NPV outcome achieves efficient investment incentives, and is in the long term interest of consumers.[139]

2.2.3 Market cost of capital

Because the market for capital finance is competitive, an efficient service provider is expected to face competitive prices in the market for funds. Therefore, we consider efficient financing costs 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 in respect of the provision of regulated services.[140] 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'.[141]

We consider employing a rate of return that is commensurate with the prevailing market cost of capital (or WACC) is consistent with the zero NPV investment condition (see above). 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.[142]

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139 AER Concurrent Evidence Session 1 – Proofed Transcript, p.15

140 See Partington, G., 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).

141 Kahn, A.E., 'The economics of regulation: Principles and institutions', The MIT Press, Massachusetts, 1988, p. 45.

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

Table 9 below outlines how we have applied benchmarking and incentive regulation in coming to our draft decision.

Table 9 Use of market data in our allowed rate of return

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 ASX300.
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 from 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.
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 is derived from the observed distribution rates of listed Australian equity. These listed Australian firms are determining 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 have regard to the degree of risk involved in providing regulated services. This is consistent with the RPPs, 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[143] 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 below.

2.3 Measuring success

In sections 2.1 and 2.2 we set out the key concepts that are particularly relevant to setting the rate of return and the value of imputation credits that contribute to the achievement of the legislative objectives to the greatest degree. In the remainder of this draft decision we set out an approach to estimating the rate of return and value of imputation credits that we consider is likely to achieve the legislative objectives to the greatest degree by focusing on these key concepts.

At our public forum in September 2017 some stakeholders questioned whether our 2013 Guidelines had contributed to achieving the legislative objectives. Similar submissions were subsequently made by the CRG, ECA, MEU, and EUAA.[144]

The CRG submitted that it considers our 2013 Guidelines have not been contributing to achieving the objectives to the greatest degree, stating:[145]

> The CRG strongly believes the Guideline is not meeting its objective.
>
> There is no testing as to whether the Guideline serves the long term interests of consumers. The available evidence demonstrates the objectives are not being met.

The ECA submitted:[146]

> On the available evidence Energy Consumers Australia concludes that the current approach to setting the allowed rate of return is not consistent with the relevant objectives. We believe the rate of return is set in excess of the efficient financing costs of an efficient entity.

The Major Energy Users Inc submitted that:[147]

> The MEU considers that the current approach to setting the RoR has provided a massive transfer of wealth from consumers to network asset owners, not only directly but also in the incentive it has provided to inefficient network investment causing future consumers to inherit a massively overstated value for the network assets they will need

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143 Handley, Advice on the Return on Equity, Report prepared for the Australian Energy Regulator, 16 October 2014, p. 4.

144 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 16.

145 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 16.

146 ECA, Review of the rate of return guideline: Response to the AER Issues Paper, December 2017, p. 13.

147 MEU, Submission by The Major Energy Users Inc, December 2017, p. 12.

The EUAA submitted:[148]

> Our view is that the 2013 Guideline has not met the NEO and NGO objectives.
>
> …
>
> Consumers have received a safe and reliable service. Unfortunately, we believe it has been achieved with far too much capital investment (see the fall in capacity utilisation rates) and poor productivity by many networks with the result that prices are far too high. Many networks are not at "benchmark" efficient levels and yet they continue to earn a secure revenue flow that produces, what limited evidence suggests, to be above normal profits for a regulated natural monopoly.

CRG submitted that, as an important component of network prices, the rate of return has contributed to an energy affordability crisis, stating:[149]

> The Review is occurring in an environment of increasing energy prices that could be described as an 'affordability crisis.' The impact has been particularly severe on low-income households, young families and trade exposed energy intensive businesses including agriculture, manufacturing and catering. Increasing network charges have been a significant contributor to these unsustainable prices.
>
> …
>
> Faced with massive retail price increases, consumers have responded where able to do so by switching fuels, adopting and investing in energy efficiency, and investing in distributed generation in the form of rooftop solar photovoltaic (PV) generation.

By contrast, the network shareholder group submitted:[150]

> The framework for incentive-based economic regulation is working as intended, specifically where investment is made by the private sector.

Energex and Ergon Energy submitted that:[151]

> Certainly, there are aspects of the AER's current approach that most stakeholders agree will contribute to the achievement of the NEO and ARORO.

Energy Networks Australia submitted that our current review should build on the 2013 Guidelines, stating:[152]

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148 EUAA, EUAA submission – AER Rate of Return Review Issues Paper October 2017, December 2017, p. 2.

149 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, pp. 16, 18.

150 NSG, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), May 2018, p. 1.

151 Energex and Ergon Energy, AER Issues Paper - Review of the Rate of Return Guidelines - Ergon Energy and Energex Submission, December 2017, p. 2.

152 ENA, AER Rate of Return Guidelines Response to Issues Paper, December 2017, p. 3.

> The 2017 Rate of Return Guideline process is an opportunity to build on considerable work undertaken in the 2013 guideline review process, and network businesses support an incremental approach building on this past guideline review

Similarly, CitiPower, Powercor, SA Power Networks, United Energy, and Australian Gas Infrastructure Group submitted that the 2013 Guidelines were the outcome of significant review:[153]

> The AER and stakeholders have generally agreed that the review of the Guideline should be incremental in nature. This is appropriate given a current Guideline already exists that itself was the outcome of significant review.

If the rate of return derived from our guideline is too high or too low then it will not promote the achievement of the legislative objectives. Consumer groups have strongly advocated that the rate of return derived from the approach set out in our 2013 guidelines is too high and it has therefore not promoted efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity.

The CRG, ECA, MEU, and EUAA referred to the following indicators that the 2013 Guidelines have not been contributing to achieving the legislative objectives to the greatest degree:[154]

- The parameter values we have chosen in our decisions are too high given the low risk in providing regulated services
- Energy prices have increased substantially resulting in price-stress for some customers, increased disconnections, and switching to alternative fuels.
- Regulatory asset bases (RABs) have increased substantially while utilisation has declined and reliability has not been an issue
- Service providers have been able to achieve supernormal profits
- Recent sales and acquisitions of service provders have been at RAB multiples materially greater than 1

We acknowledge that this review is being undertaken in an environment of heightened consumer concern about increasing energy costs and relatively large (and sometimes underutilised) investment in regulated assets bases over recent years. While the rate of return is an important contributor to network prices, there are other network and non-network costs that also contribute to overall energy prices. Nonetheless, we are

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[153] CitiPower, Powercor, SA Power Networks, United Energy, and Australian Gas Infrastructure Group, Submission on the AER Issues Paper, December 2017, p. 2.

[154] Consumer Reference Group, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 16 - 34; Energy Consumers Australia, Review of the rate of return guideline, December 2017, p. 6 - 14; MEU, Submission by The Major Energy Users Inc, December 2017, p. 14, Energy Users Association of Australia, EUAA submission – AER Rate of Return Review Issues Paper, October 2017, p. 2

cognisant of the effect that higher energy prices may have on the willingness of consumers to pay for further improvements in network reliability.

We have had regard to these factors when considering the rate of return and value of imputation credits for this decision. We have done so by adopting an approach of focusing on the best empirical estimates for rate of return parameters. In this way we consider we can determine an approach that is most likely to promote the NEO and NGO.

We have also had regard to the arguments submitted by the CRG, ECA, MEU, and EUAA on each parameter value. Our considerations of these matters are set out in the remainder of this draft decision. In a number of areas we have determined parameter values or estimation approaches that differ from those in our 2013 Guidelines. We have done so on the basis that the updated parameter values will contribute to the legislative objective to the greatest degree given the current environment. We consider the current environment is different in a number of ways to the environment at the time of our 2013 Guidelines. Most notably we consider that market volatility has subsided and risk premiums have reduced since 2012-13 (this is discussed further in the chapter 7).

We consider it is important for the achievement of the legislative objectives that we periodically review our rate of return and value of imputation credits. This process of review, combined with the use of incentive regulation, is a key driver of efficiency and the continued achievement of the legislative objectives over time. Therefore, the achievement of the legislative objectives should not be viewed solely in a static sense.

On the use of incentive regulation, the ECA submitted:[155]

> The objective is not to set the rate of return based on a benchmark so that the provider can outperform the rate of return by the way it is financed – the intention is that the rate of return is a constraint so that the provider has maximum incentive to generate higher returns by efficiency in its investments and its operations.

We agree 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 provides (in expectation) an opportunity for service providers to recover their efficient costs (without expectation of monopoly rents).

We note that 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 service providers. In chapter 10 we set out how we have

[155] ECA, Review of the rate of return guideline: Response to the AER Issues Paper, December 2017, p. 11.

considered service providers' revealed cost information when deciding on our approach to debt.

The CCP16, CRG, ECA, EUAA, and MEU submitted that we should examine information on the actual returns achieved by service providers, through data on actual profitability and RAB multiples, when considering if our rate of return achieves the legislative objectives.[156] The CCP16 submitted that actual profitability and RAB multiples could be used as a cross-check on the selection of parameter values and the overall rate of return.[157]

We consider actual profitability and RAB multiples in 3. In summary, actual profitability and RAB multiples from asset sales may provide some indication of the appropriateness of the allowed total rate of return. However, they may also be indicative of other elements of the firm's cash flows, such as unregulated activities and outperformance on expenditure allowances. Further, sales that have already occurred and past profitability may not reflect changes to the overall rate of return that are occurring at present. Ultimately, this information does not provide a definitive answer to the specific return investors require.

Overall, we consider that these measures cannot be used to directly determine parameter estimates for the allowed rate of return. We agree with the CCP16 submission that there is difficulty in disaggregating the information contained in RAB multiples and historical profitability measures to determine the degree of outperformance of the allowed rate of return.

However, we consider that there may be useful information within the trends in RAB multiples and historical profitability measures over time. Comparisons of RAB multiples and historical profitability measures can provide information on the performance of the regulatory system as a whole. This information may be helpful in considering whether the business' actual rate of return has been systematically lower or higher than the allowed rate of return.

The CCP16 submitted that this information cannot be used at a parameter level but can inform the overall exercise of judgement in setting the rate of return or reviewing other elements of the regulatory regime[158]. We agree that RAB multiples and historical profitability may provide useful contextual information that may inform our exercise of regulatory judgment necessary when determining the allowed rate of return.

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[156] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 59 - 63; Consumer Reference Group, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 20, Energy Consumers Australia, Review of the rate of return guideline, December 2017, p. 13, Energy Users Association of Australia, EUAA submission – AER Rate of Return Review Issues Paper, October 2017, p. 4; Major Energy Users, Review of the rate of return guidelines, December 2017, p 14-15.

[157] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 60- 61.

[158] Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, pp 27-28.

Further, we note in section 2.2.3 that use of market data is an important concept for achieving the legislative objectives, and we do have regard to actual returns in other parts of our rate of return estimation. Our equity beta estimation is based on data on the returns (capital gains and dividends) to listed Australian energy network firms relative to the returns on the ASX300. When estimating the market risk premium we have regard to the historical returns on the Australian stock market. We have also reviewed the actual debt costs of regulated service providers.

2.4 Risk and return

We are to determine the allowed rate of return such that it contributes to the achievement of the NEO and NGO (the Objectives). The appropriate risk compensation is also crucial in achieving the NGO and NEO[159].

2.4.1 Compensation for risk

In this section we discuss concepts of risk, WACC and SLCPM, summarise past discussions, and consider stakeholder submissions on risk.

As part of reviewing the allowable rate of return, we are required to consider how to compensate for the risk exposure of service providers in supplying regulated services. Appropriate risk compensation is an important part of the rate of return regulatory framework and is integral to achieving the legislative objectives.

What is risk?

Risk is the degree of uncertainty about an event—such as the uncertainty around the expectation of the return on an investment. [160] As explained by Handley, the risk-return trade-off is one of the most fundamental paradigms of finance.[161] The trade-off states that a risk averse investor will want a higher expected return when faced with a higher risk. This concept is illustrated by Brealey et al. below:[162]

> Investments A and B both have an expected return of 10%, but because investment A has the greater spread of possible returns, it is more risky than B. We can measure this spread by the standard deviation. Investment A has a standard deviation of 15%; B, 7.5%. Most investors would prefer B to A. Investments B and C both have the same standard deviation, but C offers a higher expected return. Most investors would prefer C to B.

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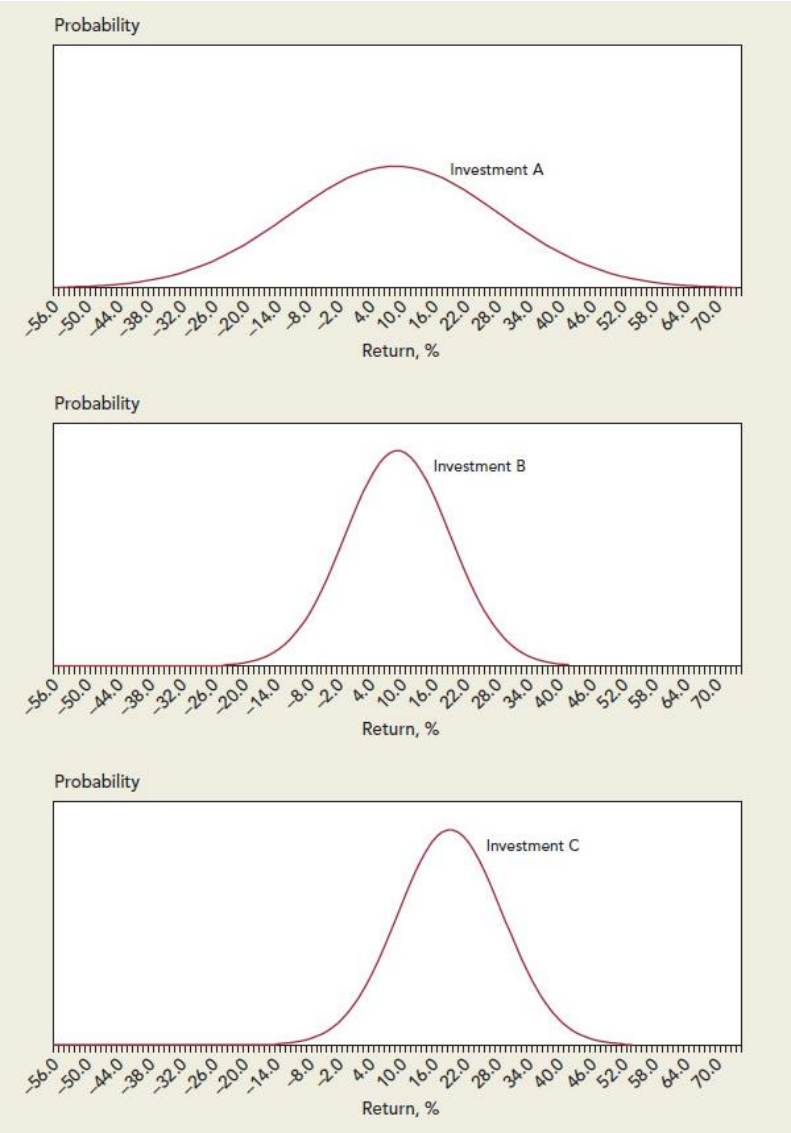
159 As set out in NER cl.6; NGR cl. 6A

160 Bishop, S., Faff, R., Oliver, B., Twite, G., 'Corporate Finance', Ed. 5 Pearson Prentice Hall, 2004, p. 577.

161 Handley, J., 'Advice on the return on equity: report prepared for the AER', 16 October 2014, p. 4.

162 Brealey, R., Myers, S., Allen, F., 'Principles of corporate finance', 2011, Ed. 10, McGraw-Hill Irwin, Figure 8.2, p. 187.

Figure 8 Risk versus expected return



Source: Brealey, Myers, Allen (2011), Figure 8.2.

The above example explains the relationship between risk and return for a single investment. For a given expected return, risk averse investors are assumed to prefer an investment with a lower variance. However, we note that for an investment in an investment portfolio, the risk relevant to its price is the risk it will add to the portfolio. Therefore, under the assumption that investors hold fully diversified 'efficient' market portfolios, only an investment's systematic risk is relevant.

In finance, there are two distinct types of risk—systematic risk (market risk or non-diversifiable risk) and non-systematic risk (firm-specific risk or diversifiable risk). That is, in finance:[163]

> The risk of any share can be broken down into two parts. There is the *unique risk* that is peculiar to that share, and there is the *market risk* that is associated with market-wide variations. Investors can eliminate unique risk by holding a well-diversified portfolio, but they cannot eliminate market risk. *All* the risk of a full diversified portfolio is market risk.

Similarly, McKenzie and Partington have advised:[164]

> Modern finance theory specifies that the risk to be compensated via the WACC is the non-diversifiable, or systematic, component of total risk (in simple terms, that risk which cannot be eliminated by holding stocks in a well diversified portfolio). This risk is measured as covariance, or equivalently beta, risk.

The appropriate risk compensation is also crucial in achieving the NGO and NEO[165]. The Objectives require the promotion of efficient investment in, and efficient operation and use of, energy network services for the long-term interests of energy consumers.[166]

Efficiency

When considering an efficient return for risk, it is important to differentiate between risk that is efficiently compensated through the allowed rate of return (compensable risk) and non-compensable risk. When developing the 2013 Guideline, we commissioned Frontier to explore these risks and to provide advice on what risks we should compensate service providers for through the allowed rate of return. [167]

In estimating an efficient allowed rate of return, we highlight five factors that we consider important:

- Estimating a forward-looking return
- Estimating a market return through use of market data
- Providing a return for systematic risk
- The role of incentive regulation
- Similar degree of risk as a service provider in the provision of regulated services

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163 Brealey, R., Myers, S., Partington, G., Robinson, D., 'Principles of corporate finance', 2007, The McGraw-Hill Companies Inc., 2007, p. 201.

164 McKenzie, M., Partington, G., *Risk, asset pricing models and WACC*, June 2013, p. 10.

165 As set out in NER cl.6; NGR cl. 6A

166 The National Electricity Objective is in section 7 of the National Electricity Law and the National Gas Objective is in section 23 of the National Gas Law.

167 Frontier, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, July 2013.

Forward looking return

Risk is the degree of uncertainty about an event—such as the uncertainty around the expectation of the return on an investment.[168] It is strictly a forward-looking concept, as no event is uncertain after it has occurred.

Use of market data

Because the market for capital finance is competitive, an efficient service provider will face competitive prices in the market for funds. We continue to be of the view that efficient financing costs 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 in respect of the provision of standard control, prescribed transmission, or reference services.[169]

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'.[170]

We maintain the view that economic efficiency is advanced by employing a rate of return that reflects rates in the market for capital finance.[171] Partington and Satchell have also interpreted efficient financing costs as the opportunity cost of capital, which is a market rate of return for assets with a given level of risk.[172]

We have received divergent submissions that discuss the use of market data.

Australian Pipeline and Gas Association's submission to the evidence session supports the use of market data to estimate costs.[173]

Energy Users Association of Australia submitted concerns with transparency in regulation as well as the use of available data.[174] We consider that the use of market data assists in addressing the Energy Users Association of Australia's concerns about transparency.

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168 Bishop, S., Faff, R., Oliver, B., Twite, G., 'Corporate Finance', Ed. 5 Pearson Prentice Hall, 2004, p. 577.

169 See Partington, G., 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).

170 Kahn, A.E., 'The economics of regulation: Principles and institutions', The MIT Press, Massachusetts, 1988, p. 45.

171 For example, see: AER, Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return, November 2017, p. 12, 16. AER, Final decision United Energy distribution determination 2016 to 2020 Attachment 3–Rate of return, May 2016, pp. 281–292.

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

173 Australian Pipeline Gas Association, Submission to the AER, Review of rate of return guideline, 4 May 2018, p.3

174 Energy Users Association of Australia, EUAA submission – AER Rate of Return Review Issues Paper, October 2017, p. 5–6.

Energy Consumers Australia highlighted their opposition to the use of market data, believing that it reflects risks (and returns) greater than that of service providers.[175] Instead, the Energy Consumers Australia suggested to go into more depth, and consider how much risk individual assets owned by the companies have. [176] Our view is that while conceptually Energy Consumers Australia's proposal may provide a finer estimate of risk, it may not be entirely feasible in reality. This is because data for estimating systematic risk on an individual asset basis is unlikely to be observable.

The Consumer Reference Group submitted that the volatility in market data/share price for the firms included in our comparator set may be related to market sentiment rather than the fundamental characteristics.[177] Additionally, they raised that the comparator firms have unregulated sources of revenue and therefore contain more risk than if they were only providing regulated services.[178] This view was also submitted by the Major Energy Users.[179]

We acknowledge that stocks can experience short-term fluctuations due to market movements and one-off events. To mitigate the effects of short-term movement, we consider regressions using multiple estimation periods when considering the equity beta parameter (see section 8.3.2 for more discussion).[180]

We consider that, ideally firms that share all or most of the key characteristics of a benchmark efficient entity would be used in our estimates. However, in practice, few firms would fully reflect this benchmark. Therefore, we use market data for domestic businesses that are considered to be reasonable comparators to a benchmark efficient entity with a similar degree of risk as an entity providing regulated services to inform the equity beta estimate. We discuss this point in detail in section 0.

Diversification and compensation for systematic risk

The rate of return allows a service provider to compensate investors for the risk of committing capital to fund investments in its network. While we agree with the view that all risks should be accounted for in the risk framework[181], we maintain the view that investors do not require compensation via the rate of return for all risks involved in investing in a service provider.

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175 Energy Consumers Australia, Review of the rate of return guideline, December 2017, p. 20.

176 Energy Consumers Australia, Review of the rate of return guideline, December 2017, p. 15–18.

177 Consumer Reference Group, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 47

178 Consumer Reference Group, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 26.

179 Major Energy Users, Review of the rate of return guidelines, December 2017, p 7–8.

180 We consider an estimate from the longest estimation period available, as well as a period that excludes the 'technology bubble' and the global financial crisis. AER, Better Regulation Explanatory Statement Rate of Return Guideline (Appendices), December 2013, p. 49

181 Network Shareholder Group, Submission on the Rate of Return Guideline review, May 2018, p.12, Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence Expert Joint Report, April 2018, p.10, Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions, p.7

Since investors can eliminate non-systematic risk by holding a well-diversified portfolio, then it is unlikely that investors will require compensation for these risks. It follows that it would be inefficient to compensate investors for this non-systematic risk in the allowed rate of return.

The view that only systematic risks should be compensated through the allowed rate of return is an area of agreement between experts other than David Johnstone who has concerns with the CAPM framework but did not propose an alternative.[182]

In setting the allowed return on equity in our previous decisions, we provided compensation for the systematic risk that an efficient service provider would face through the equity beta.[183] The equity beta under the SLCAPM measures systematic risk as the sensitivity of an asset or business to the overall movements in the market.[184] It does this by measuring the standardised correlation between the returns on this asset or business with that of the overall market.[185]

We have since received submissions questioning the appropriateness of beta and CAPM, which we consider in chapter 8.

The Consumer Challenge Panel submitted that the risk of network businesses not achieving their expected rate of return is low due to regulation insulating businesses from asset impairment.[186] This submission is consistent with our view and with the method of estimating the expected allowed return of a benchmark efficient entity's costs and incentives of efficient investment.

In setting the allowed return on debt, we provide the efficient compensation for the risks that an investor in the service provider's debt faces, as they are included in the promised returns we observe using our debt data sources.[187] Further, since we provide a return on debt based on the promised yield, our allowed rate of return will be slightly above the expected return. This is because we consider that promised returns will exceed expected returns, as the expected return is the promised return less the default

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182 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence Expert Joint Report, April 2018, p.23.

183 For example, AER, *Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return*, November 2017, p. 20.

184 Theoretically, this asset or business is 'a benchmark efficient entity'. In practice, we use a sample of businesses we consider comparable to a benchmark efficient entity to calculate equity beta. See: AER, Better regulation explanatory statement rate of return guideline, December 2013, pp. 83–86.

185 McKenzie, M., Partington, G., *Risk, asset pricing models and WACC*, June 2013, p. 21; Brealey, R., Myers, S., Partington, G., Robinson, D., 'Principles of corporate finance', 2007, The McGraw-Hill Companies Inc., 2007, p. 107.

186 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, p.5

187 We observe the promised returns of debt issued by a sample of firms we consider comparable to a benchmark efficient entity based on the benchmark credit rating and term. In practice, we may have overcompensated a benchmark efficient entity for these risks as we observe broad BBB debt whereas we consider a benchmark efficient entity would issue BBB+ debt. In this draft decision we have refined our method — see chapter 10.

risk.[188] This means the overall allowed return includes some compensation for the expected default loss on debt due to non-systematic risk.

Benchmarking and incentive regulation

The service providers' actual returns could differ from the allowed return depending on how efficiently it 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) service providers to retain (fund) any additional income (costs) as a result of outperforming (underperforming) the efficient benchmark.[189]

Similar degree of risk

The ARORO aims to set the efficient financing costs of a benchmark efficient entity (BEE) with a similar degree of risk as that which applies to the service provider in respect of the provision of (in the case of the NER standard control or prescribed transmission services) or (in the case of the NGR reference services). Given this, an essential concept to consider in giving effect to the ARORO is 'risk'.

The risk of providing regulated services is a core element of the rate of return due to the important relation between risk and required returns in finance theory. This ensures that the allowed rate of return provides a reasonable opportunity to recover efficient financing costs relative to risks, and promotes efficiency in investment, provision and use of regulated services.

There were divergent views on the concept of a benchmark efficient entity:

- Illan Sadeh and Greg Houston considered a benchmark efficient entity an important concept, highlighting its impact on judgement and discretion since the use of a benchmark removed the need for the regulator to make decisions about a service provider's financing decisions.[190]
- David Johnstone suggested that the regulator should be highly interested in service providers' financing decisions and therefore uncertain about using a BEE.[191]
- The Network Shareholder Group submitted that the concept of a benchmark efficient entity is critical to the incentive framework and establishing an effective rate of return. The opportunity to outperform the benchmark encourages investment, efficiency and innovation.[192]

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188 For further explanation, see McKenzie and Partington, *Report to the AER: The relationship between the cost of debt and the cost of equity*, March 2013, pp. 7, 21; AER, *Final decision: Access arrangement final decision—Multinet Gas (DB No. 1) Pty Ltd, Multinet Gas (DB No. 2) Pty Ltd 2013-17*, March 2013, Part 3, p. 48

189 NEL, s. 7A (3); NGL s. 24(2) (b).

190 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p.12-16.

191 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 17

192 Network Shareholder Group, , Response to issues paper on the review of the Rate of Return Guidelines, December 2017, p.5

We consider that the concept of a benchmark is important given we apply an incentive regulatory framework rather than a cost of service approach which is generally consistent with evaluating service providers' actual financing decisions. We also note that under the current rate of return provisions of the NER our regulatory task is to determine the allowed rate of return such that it achieves the ARORO, which includes the term 'benchmark efficient entity' in its definition:[193]

In setting the allowed return on equity, we provide compensation through the equity beta for the systematic risk that a benchmark efficient entity would face. In setting the allowed return on debt, we provide compensation using a benchmark credit rating for a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of providing regulated services. We use market data for firms that we consider are most similar to the regulated service providers risk profile. We consider that this market data reveals the required compensation for an investment with a similar degree of risk as that which applies to a service provider in respect of the provision of standard control, prescribed transmission, or reference services.[194]

We maintain the view that the Australian market is the market within which a benchmark efficient entity for each service provider operates, and this is appropriate to make it properly comparable in degree of risk to the service providers. This recognises that the location of a business determines the conditions under which the business operates and these include the regulatory regime, tax laws, industry structure and broader economic environment. As most of these conditions will be different from those prevailing for overseas entities, the risk profile of overseas entities is likely to differ from those within Australia. Consequently, the returns required are also likely to differ. Hence, when estimating input parameters for equity we have placed most reliance on Australian market data whilst using overseas data informatively.

We have received stakeholder submissions that proposed including international energy firms in our comparator set for estimating the equity beta parameter. This is discussed in more detail in section 8.3.4.

Technological risk

We recognise that disruptive technologies such as solar panels, smart technology and power storage are beginning to change how consumers produce and consume electricity.[195] We also recognise this could affect how consumers use network infrastructure and may change some risks faced by service providers.

We have received submissions on technological risk's impact on the rate of return:

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193 NER, cl. 6.5.2(c); NER, cl. 6A.6.2(c); NGR r. 87(3).

194 See Partington, G., 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).

195 For example, AER, Final decision SA Power Networks determination 2015–16 to 2019–20, Attachment 3 - Rate of Return, October 2015, p. 447.

- Service providers have stated that we have not adequately accounted for the recent risks arising from disruptive technologies.[196]
- APA views that limited data and effects of regulatory change make explicit consideration of the effects of disruptive technologies on systematic risk difficult. Additionally it also submitted that technology will also affect gas fired power generation and the transportation of gas.[197]
- Evoenergy submitted that any change in systematic risk arising from technological changes will take some time to be reflected in beta estimates, emphasising the importance of these changes in determining the direction of beta estimates.[198]

We continue to be of the view that the technological risks submitted to us should not be compensated through the rate of return for the following reasons:

In determining whether this risk needs to be accounted for in the equity beta (or the rate of return generally), we have to consider whether the risk is systematic. We consider developments in the sort of technologies (such as distributed generation, smart technology and power storage) are unlikely to have significant effects outside the energy sector. Investors in the market would be able to diversify such risks by investing in other industries. This point was highlighted by Graham Partington in the expert evidence sessions[199].

- Jemena agreed that risks stemming from technological change may be non-systematic and may require compensation through cash follows rather rate of return allowance.[200]
- The New Zealand Commerce Commission also noted that technological risk is 'generally non-systematic in nature and so is not relevant to WACC'.[201]
- Energy Networks Australia sought clarification of our view on stranding risk.[202] To the extent that there are genuine risks of extreme changes in demand for specific service providers which present the potential for asset stranding, the regulatory regime for gas and electricity can mitigate the risk by providing prudent discount and accelerated depreciation provisions. Further, the rules protect capital invested.[203]

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196 See, for example, Cheung Kong Infrastructure – Submission on rate of returns issue paper – 12 December 2017, p. 3-4; Energy Networks Australia – Submission on rate of returns issue paper – 12 December 2017, P.7, Consumer challenge panel 16 – submission on rate of returns issue paper – 12 December 2017, p.37.

197 APA, Submission responding to discussion papers and expert evidence, 4 May 2018, p.16

198 Evoenergy, Review of rate of return guideline –evidence sessions, 4 May 2018, p. 2. , APA,

199 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 47

200 Jemena, Submission on concurrent expert sessions and discussion papers, 4 May 2018, p. 3.

201 New Zealand Commerce Commission, Input methodologies review decisions, Topic paper 4 cost of capital issues, 20 December *2016,* p.109

202 Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 7, 30

203 NER, cl, 6A.26.

- The effects of technological risk can be uncertain and changes to technology may also lead to positive impacts for businesses. Graham Partington and Stephen Satchell use the example of an increase in electric cars likely creating large demand for electricity charging points.[204] Therefore, it is not clear to us that the final impact of the sort of technology risk noted by service providers require compensation through the rate of return.

Graham Partington and Stephen Satchell also noted that 'to the extent that technological risks is systematic it will be reflected in the equity beta, without the need to undertake additional analysis.'[205]

We note Illan Sadeh, Stephen Gray and Evoenergy expressed the view that the market did not fully factor in technological risk.[206] However, it is not clear that is the case. As previously noted in this section 2.2.3, we consider that market data is appropriate for informing our rate of return parameters. It is also standard practice to use market data to estimate equity beta. Our analysis of broker and valuation reports show that there has been no explicit adjustments to rate of return parameters for the technological risks highlighted in the above submissions. Further, to the extent a technological risk is not reflected in the market data, then this may be non-systematic and does not warrant compensation through the rate of return on an ex-ante basis.

In respect of the view that technological risk is systematic, the Consumer Challenge Panel considered this view is tenuous and unproven.[207] Additionally, the Consumer Challenge Panel also stated that consumers bear the risk of the underutilised assets, as the full costs of the assets must continue to be reflected in the regulated revenues and prices. The view that consumers bear stranded asset risk was also highlighted by Energy Users Association of Australia.[208] The Consumer Challenge Panel also noted that many industries are affected by changes in technological trends but do not receive adjustment assistance. [209]

After reviewing all evidence presented to us, our view is that a specific adjustment to the rate of return should not be made to account for technological change.

Catastrophic and other risk

Submissions and experts discussed the treatment of catastrophic risks that are of low probability, but have the potential for significant damage (such as natural disasters).

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[204] Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, May 2018, p.4

[205] Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, May 2018, p.10

[206] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p.52. Evoenergy, Review of rate of return guideline – evidence sessions – May 2018, p.2

[207] Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 44-46.

[208] Energy Users Association of Australia, EUAA submission – AER Rate of Return Review Issues Paper, October 2017, p.8

[209] Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p.44

Our view is that these risks should not be compensated through the rate of return via the equity beta parameter for the following reasons:

- Catastrophic risk cannot be considered systematic risks, as the risk is unrelated to the market and only a portion of the market is affected.[210] This was an area of agreement in the first concurrent evidence session.[211]
- The risks can be mitigated by the option to purchase insurance, with insurance costs flowing through to customers through our opex allowance. This view was highlighted by experts, investors and consumer advocates. [212]
- Catastrophic risks can be mitigated via the potential to pass the costs to relevant users and shipwreck clauses. However, Graham Partington and Stephen Satchell note the risk of automatically allowing the costs of such events to be passed onto consumers, effectively transferring the risk away from providers.[213]

We have received submissions from the Network Shareholder Group and APA suggesting Australian governments have increased perceived and actual intervention in regulation which has translated into increased regulatory risk and will see a negative impact on capital investment.[214] Energy Consumers Australia submitted the opposite view, stating that political, regulatory and sovereign risk in Australia is low. [215]

The Consumer Challenge Panel submitted that it considered policy risks are not systematic. It stated that: [216]

- The AER should regulate under the existing rules where the consumer not the utility bears the policy risks
- Compensation should not be provided ex ante for the uncertain possibility of a policy change by governments.
- If there is to be compensation for the financial impacts of a policy change, that is a matter for consideration by governments at the time of the policy change, not by the regulator in anticipation of the policy change. This view was also highlighted by Ian McAuley.[217]

We are of the view that the regulatory risks (government intervention and uncertainty in policy) should not be compensated through the rate of return for the following reasons:

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[210] Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, May 2018, P.11

[211] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p.47

[212] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p.46, p.50, p.59, Network Shareholder Group, Submission on the Rate of Return Guideline review, May 2018, p.8, Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p.3

[213] Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, May 2018, p.11

[214] Network Shareholder Group, Submission on the Rate of Return Guideline review, May 2018, p.7 , APA, Submission responding to discussion papers and expert evidence, 4 May 2018, p.16

[215] Energy Consumers Australia, Review of the rate of return guideline, December 2017, p.26

[216] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 44–46.

[217] Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 3

- Similar to technology risks, the regulatory risks are unlikely to have significant effects outside the energy sector. Investors in the market would be able to 'diversify' away such risks by holding a market portfolio. As a result, we do not consider the risk arising from policy changes can be reasonably classified as systematic risk[218] and be accounted for in the equity beta (or the rate of return generally) for a benchmark efficient entity on an ex-ante basis.[219]
- To the extent any compensation is deemed necessary, we consider it should be determined by the government, as our regulatory task is to set rate of return to efficiently compensate for the systematic risk of supplying regulated energy network services.

CAPM

In setting the allowed return on equity, we provide compensation through the foundation model approach for the systematic risk that an efficient service provider would face. The equity beta under the SLCAPM measures systematic risk as the sensitivity of an asset or business to the overall movements in the market. [220] It does this by measuring the standardised correlation between the returns on this asset or business with that of the overall market.[221]

There was a degree of disagreement with the SLCAPM being an appropriate framework for reflecting systematic risk and the required rate of return for a service provider:

- The Energy Consumers Australia suggested a "direct risk-based approach".[222] The submission did not contain further details regarding this alternative approach, including a suggested methodology.
- Ian McAuley and Major Energy Users pointed to beta as an indicator of short-term volatility, which is largely irrelevant for long-term systematic risk.[223]

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[218] For example, AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 447–448;

[219] In our April/June 2015 final and preliminary decisions, we considered that, 'Even if the risk arising from disruptive technologies has increased the systematic risk of a benchmark efficient entity, we consider this will be captured in our empirical equity beta estimates to the extent that investors are aware of the risk' (see, for example, AER, Jemena Gas Networks final decision 2015-20: Attachment 3—Rate of return, June 2015, p. 406). We do not consider the risk arising from disruptive technologies can be reasonably classified as systematic risk. As Partington and Satchell stated in their October 2015 report, 'Since we do not consider the impact of disruptive technology to be a systematic risk we do not consider that it would be captured by estimates of beta, however recent they are' (see Partington and Satchell, Report to the AER: Analysis of criticism of 2015 determinations, October 2015, p. 39).

[220] Theoretically, this asset or business is 'a benchmark efficient entity'. In practice, we use a sample of businesses we consider comparable to a benchmark efficient entity to calculate equity beta. See: AER, Better regulation explanatory statement rate of return guideline, December 2013, pp. 83–86.

[221] McKenzie, M., Partington, G., *Risk, asset pricing models and WACC*, June 2013, p. 21; Brealey, R., Myers, S., Partington, G., Robinson, D., 'Principles of corporate finance', 2007, The McGraw-Hill Companies Inc., 2007, p. 107.

[222] Energy Consumers Australia, Review of the rate of return guideline, December 2017, p.26

- Ian McAuley and The Australian Institute also noted that a service provider could be uncorrelated with the overall market and receive only the risk free rate.[224]
- The Consumer Reference Group submitted that a more fundamental review was required due to major issues with the CAPM.[225]
- We also received a wide range of submissions supporting the SLCAPM framework.[226]

While we acknowledge that all models are simplifications, we agree with Graham Partington and Stephen Satchell's view that the SLCAPM framework is the best approach to reflect the systematic risk of a benchmark efficient entity.[227] We reached this view for the following reasons:

- There is widespread agreement for an incremental review of the Guideline implies continued use of the foundational model approach (including the SLCAPM). [228] This is unless material changes in risks or market conditions justify an alternative approach. The joint expert report noted that there has been no compelling evidence to change our approach.[229]

We have received agreement from many submissions that the foundational model approach should continue to be applied.[230] This includes the use of the SLCAPM.

- Financial market practitioners, academics and other regulators consistently use the SLCAPM for estimating the expected return on equity[231]. The Network Shareholder

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223 Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 2 Major Energy Users, Review of the rate of return guidelines, December 2017, p 7–8.

224 Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 2 The Australian Institute, Submission to the review of the rate of return guidelines, December 2017, p. 5.

225 Consumer Reference Group, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p.37

226 Network shareholders group, Submission on the Rate of Return Guideline review, p.9, Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions, p.8, Australian Pipeline Gas Association, Submission to the AER, Review of rate of return guideline, 4 May 2018, p.2

227 Partington, G., Satchell, S., *Report to the AER: Allowed Rate of Return 2018 Guideline review, May 2018*

228 For example, see Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions , p44, or , Australian Pipeline and Gas Association, Submission to issues Paper: AER Review of the rate of return guideline, 12 December 2017, p.2, Network Shareholder Group, Submission on the Rate of Return Guideline review, May 2018, , p.8, Jemena, Submission on concurrent expert sessions and discussion papers, 4 May 2018, p.3, Public Interest Advocacy Centre, Submission on rate of return guideline review issues paper, 18 December 2017, p.2, Network Shareholder Group, Response to issues paper on the review of the Rate of Return Guidelines, December 2017, p.9,

229 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence Expert Joint Report, April 2018, p.23

230 Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions, p.8, Jemena, Submission on concurrent expert sessions and discussion papers, 4 May 2018, p.3, Network Shareholder Group, Submission on the Rate of Return Guideline review, May 2018, p.3 Public Interest Advocacy Centre, Submission on rate of return guideline review issues paper, 18 December 2017, p.2 Network Shareholder Group, Response to issues paper on the review of the Rate of Return Guidelines, December 2017, p.9

Group and Energy Networks Australia submissions following the concurrent expert sessions supported this view.[232]

- The SLCAPM reflects the risk-return relationship in a clear and simple relationship. We have not received robust evidence that service providers are uncorrelated with the market.
- Has well-accepted and unbiased methods for estimating its parameters, and these parameters can be estimated with tolerable accuracy.[233] The availability and potential for bias in analysis was highlighted as a concern by the National Seniors Australia.[234]
- We have regard to the prevailing conditions in the market for equity funds.[235] We use other relevant sources of information to cross-check the foundation model estimate. The triangulation of estimates from relevant market participants broadly supports our foundation model estimate of the return on equity.

Stephen Gray, Greg Houston and Illan Sadeh submitted the view that the long term systematic risk is generally constant over time.[236] Combined with our emphasis on long term estimation periods, the effects of short term volatility is mitigated.

- Analysis by Graham and Harvey found that the market factor proposed by Sharpe was the dominant factor in asset pricing models.[237]

We note that Stephen Gray and Energy Networks Australia expressed the view that the rate of return should be set above the SLCAPM estimate to reflect potential shortfalls over time.[238] However, it is not clear that this is warranted on the basis of ex-post performance. We set an ex-ante return on equity that efficiently compensates for the risks of supplying regulated energy network services over a relevant regulatory period.

We note that the CCP proposed that the rate of return should be adjusted for upside risks in the regulatory framework (for example incentive schemes).[239] However, we note that firms benefit/loses from incentive schemes on an ex-post basis. As we set the

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231 See AER, *Explanatory statement to the rate of return guideline (appendices)*, 17 December 2013, pp. 12–13.

232 Network Shareholder Group submission to the Rate of return guideline review, 4 May 2018, p 9, Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions, p. 8

233 Partington, G., Satchell, S., *Report to the AER: Allowed Rate of Return 2018 Guideline review* , May 2018, p.12

234 National Seniors Australia, Issues Paper: Review of the rate of return guidelines, December 2017, p.2

235 NER, cl 6.5.2(g); NER, cl 6A.6.2 (g); NGR, r. 87 (7).

236 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p.22

237 Graham, J. and Harvey C. (2001) The Theory and Practice of Corporate Finance: Evidence from the Field, *Journal of Financial Economics* 60.

238 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 44, Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions, p.30

239 Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p.43

rate of return on an ex-ante basis, we do not consider incentive schemes warrant inclusion.

We note that David Johnstone challenged the use of the SLCAPM[240]. However, no alternative was presented as a replacement.

Weighted Average Cost of Capital

The National Gas and Electricity Rules require us to have regard to relevant estimation methods, financial models, market data and other evidence. The Rules also highlight the desirability of consistent application of financial parameters that are relevant or common to the return on equity and debt.[241]

We use an estimated weighted average return on capital (equity and debt) that a benchmark efficient entity would require to finance investment in its network.[242] The WACC model utilises market data, and allows the incorporation of equity and debt models to predict an average of the return on equity and debt, fulfilling these requirements.

We have received submissions that suggest that the use of WACC is inappropriate:

- Consumer groups submitted that the model is set in a competitive market and does not reflect the risk environment of a regulated market.[243]
- Evoenergy and Energy Networks Australia submitted that we should identify risks relevant to the allowed rate of return and assess how each risk is addressed in the framework.[244]
- Public Interest Advocacy Centre has also submitted that we should examine risks through a bottom up analysis.[245]

We continue to be of the view that the WACC model is appropriate to estimate the allowed rate of return for the following reasons:

- We note that, regardless of the industry, firms need to offer a competitive (that is market-based) rate of return to attract and retain investor funds. Further, as discussed in section 2.4.3, the regulatory framework can mitigate the impact of (systematic) risks but does not completely eliminate these risks.

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240 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p.47

241 NER, cl. 6.5.2(e), NER cl, 6A.6.2 (e); NGR, r. 87(5).

242 The term service provider relates to service providers that provide gas and electricity transmission and distribution services.

243 Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 1, Consumer Reference Group, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 36, Canegrowers, Submission to AER review of the rate of return guideline, December 2017, p.4, Major Energy Users, Review of the rate of return guidelines, December 2017, p 7

244 Energy Networks Australia – AER Rate of Return Guidelines Response to Issues Paper – 12 December 2017, p.7, Evoenergy, Review of rate of return guideline –evidence sessions, 4 May 2018, p.2,

245 Public Interest Advocacy Centre, Submission on rate of return guideline review issues paper, 18 December 2017, p. 2.

- The WACC model avoids the need to calculate the required compensation for each risk faced by the networks and the assessment of whether each risk is systematic.
- We have considered the risks affecting firms in the supply of regulated energy network services as part of our conceptual consideration of risk–this is not dissimilar to Public Interest Advocacy Centre's proposal. We concluded that the systematic risk for a benchmark efficient entity with a similar degree of risk as a service provider in the provision of regulated energy network services would be below the market average of 1.0 (see section 8.3.1 for more detail). We have identified the key risk affecting the return on equity is systematic risk. This is measured by the equity beta parameter in the SLCAPM and it is standard practice to use market data to estimate this parameter.
- We consider employing a rate of return that is commensurate with the prevailing market cost of capital (or WACC) is consistent with the zero NPV investment condition (see above). Experts at our concurrent evidence sessions agree that only systematic risk is explicitly compensable through WACC and non-systematic risks are reflected through expected cash flows.[246] There was also agreement that consumer interests are best achieved by setting the allowed return to be the opportunity cost of capital for investors[247] and that WACC estimates the expected return that investors would require.[248]
- In setting the allowed return on debt, we provide the efficient compensation for the risks that an investor in the service provider's debt face. These risks are included in the promised returns we observe using our debt data sources.[249] Further, since we provide a return on debt based on the promised yield, our allowed rate of return will be slightly above the expected return. This also means the overall allowed return includes some compensation for the expected default loss on debt due to non-systematic risk. The key risks for debt holders are systematic risk, credit risk (the risk of default and credit rating downgrades) and liquidity risk.[250]

2.4.2 Gas and electricity

246 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence Expert Joint Report, April 2018, Page 23

247 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence Expert Joint Report, April 2018, Page 10-11

248 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence Expert Joint Report, April 2018, Page 23

249 We observe the promised returns of debt issued by a sample of firms we consider comparable to a benchmark efficient entity based on the benchmark credit rating and term. In practice, we may have overcompensated a benchmark efficient entity for these risks as we observe broad BBB debt whereas we consider a benchmark efficient entity would issue BBB+ debt.

250 McKenzie, M., Partington, G., *Risk, asset pricing models and WACC*, June 2013, p. 14.

We estimate the efficient financing costs of a BEE that has a similar degree of risk as that which applies to the service provider in respect of the provision of regulated services.[251]

If the systematic risk of providing different network services by gas and electricity networks are different then we may need to recognise different benchmarks. In assessing whether more than one benchmark is required, the key issue is whether there is a difference in risks between gas and electricity regulated network services.

We have received divergent views on this topic:

- APA, Australian Pipeline and Gas Association and Ian McAuley have submitted that there are differences in risk between gas pipeline businesses and electricity network companies. [252]
- Most experts agreed in the second evidence session that there were no strong theoretical reasons for believing that the beta of regulated electricity and gas should be the same. Stephen Gray and Greg Houston stated that there are differences in risk between gas and electricity businesses and that they warrant different equity betas.[253] However, there was no agreement if equity beta would be different for different types of businesses.[254]
- APA submitted that there are differences in the size and composition of user bases and contractual agreements between companies.[255] For example, gas is a more dominant fuel source in industries with higher exposure to economic cycles such as construction, while electricity is primarily for residential consumers. [256]
- APGA submitted that there are differences in price elasticity of demand due to the availability of substitutes[257].
- Experts at the evidence session mentioned a 2016 New Zealand Commerce Commission decision in support of a higher equity beta for regulated gas businesses to regulated electricity businesses. [258]

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[251] Under the different rules, regulated network services for electricity transmission is 'prescribed transmission services', electricity distribution is 'standard control services' and the gas sector refers to 'reference services'. See NER, cl. 6.5.2(c), NGR r. 87(3).

[252] APA, AER Rate of return issues paper, 12 December 2017, p. 5, Australian Pipeline and Gas Association, Submission to issues Paper: AER Review of the rate of return guideline, 12 December 2017, p.3, Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 3,

[253] AER, Concurrent evidence session 1- Proofed transcript of proceedings, 15 March 2018, Australian Pipeline and Gas Association, Submission to the AER, Review of rate of return guideline, p 17

[254] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 49.

[255] APA, submission responding to discussion papers and expert evidence, p.17, Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 1

[256] APA, submission responding to discussion papers and expert evidence, p.17

[257] Australian Pipeline and Gas Association, Submission to the AER: Review of the rate of return guideline, May 2018, p.5

- Graham Partington and Satchell's view is that it would be difficult to justify separate equity betas to different sectors of the industry and would be even more difficult to quantify this difference. The view that differences in risk will be hard to distinguish is supported by the CCP.[259]

We have not started from the position that there should be only one benchmark for both gas and electricity (or a one size fits all). Having reviewed the submissions,[260] we do not consider they provide substantively new material or information to that considered in the 2013 Guideline and subsequent regulatory decisions:[261]

We consider the regulatory framework for gas and electricity service providers are similar. Both gas and electricity service providers face limited competition risk by virtue of being regulated natural monopolies. Generally, competition risks for service providers are low. While electricity transmission service providers are required to use a revenue cap, there is a range of controls available for electricity distribution and gas service providers to propose (as part of the Framework and Approach Paper). We currently apply revenue caps to all except one electricity distributor.[262] The current controls for those areas can mitigate demand risk.[263] Refer to

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[258] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p.60, Australian Pipeline and Gas Association, submission to the issues paper, AER review of the rate of return guideline, December 2017, p.3, AER Concurrent Evidence Session 2 – Proofed Transcript, April 2018 p.40

[259] Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 82.

[260] Energy Consumers Australia, Review of the rate of return guideline, December 2017, P.15-18

[261] Submissions in the 2013 Rate of return guideline highlighted different regulatory regimes, commercial arrangements, price elasticity of demand, user bases, and availability of substitutes (p.183-184). These topics were similar to the recent submissions. See APA, Submission responding to discussion papers and expert evidence, 4 May 2018, p 17-18.

[262] We apply an average revenue cap to EvoEnergy. Going forward, Evoenergy will transition into a revenue cap for the 2019-24 regulatory control period. Evoenergy, Attachment 11: Control Mechanisms, Regulatory Proposal for the ACT electricity distribution network 2019-2024, January 2018, p.1

[263] See: NER, cl. 6A.4.2 (a) (1); NER, cl. 6.2.5(b); NGR, r. 97(2).

- Table 10, in section 2.4.3.
- To the extent that there are genuine risks of extreme changes in demand for specific service providers which present the potential for stranding of an asset, the regulatory regime for gas and electricity can mitigate this risk by providing prudent discount and accelerated depreciation provisions.[264]
- Our Australian empirical analysis is based on a comparator set which includes gas service providers. Therefore, if there are differences in the systematic risks of electricity and gas service providers, this may be captured in our Australian empirical estimates of equity beta. See section 0 for a list of firms in our comparator set.

It is also not clear that the experts supported different betas for gas and electricity businesses: [265]

- Illan Sadeh noted that differences in businesses do not necessarily translate into the rate of return, but rather the opex allowance.[266] The point that differences may be reflected in opex was supported by Stephen Gray.[267]
- There was no agreement on whether different benchmarks were warranted.[268] Partington noted difficulty in reliably measuring the risk differences, Johnstone noted the possibility of upside risks and Gray noted there may be discussions on whether risks are partially non-systematic.

New Zealand Commerce Commission Decision

In its 2016 review, the NZCC adopted a gas beta 0.05 higher than electricity after aggregating four factors: [269]

- Results of an analysis on gas beta subsample relative to energy and electricity
- Gas having a higher income elasticity of demand than electricity
- Low gas penetration in New Zealand relative to other countries in comparator sample
- Overseas regulatory precedent

However, we do not find the NZCC's rationale to be sufficiently persuasive to warrant different equity betas for gas and electricity betas in Australia for the following reasons:

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[264] For prudent discounts, see NER, cl. 6A.26, NGR r. 96; for accelerated depreciation provisions see NER, cl. 6.5.5(b)(1), 6A.6.3(b)(1); NGR, r.89(1).

[265] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p.57- 58

[266] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p.63.

[267] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 58

[268] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence Expert Joint Report, April 2018, p.49

[269] New Zealand Commerce Commission, *Input methodologies review decisions, topic paper 4 cost of capital issues, December 2016, Paragraph 374*

The NZCC has acknowledged that "neither of these factors are sufficient in supporting an uplift in isolation".[270]

The NZCC's reasons do not appear to be relevant to the firms we regulate as

- The beta analysis was based on a comparator sample of NZ, Australian, UK and US utility firms, which included vertically integrated utilities. This conflicts with our decision to use a domestic pure-play comparator set due to differences in risk and regulatory environments.[271]
- The low gas penetration is less relevant in the Australian market, with 56 per cent of Australia connected to gas compared to only 21 per cent of North Island.[272] NZCC viewed the low level of penetration as an indication of high expansion potential and asset stranding (deemed partly systematic).[273]
- It is also not clear whether gas has a higher price elasticity than electricity. The ACCC's east coast gas inquiry concluded that suppliers had market power over gas users. [274]

We note APGA's submission that the NZCC report shows the asset betas of US regulated gas businesses lie above electricity businesses.[275] However, the NZCC report also noted the following observations:

- Ofgem uses the same equity beta for distribution and similar betas for transmission.
- European evidence also provides mixed direction, with half of the regulators in the NZCC sample use the same asset beta, or a lower asset beta for gas.[276]
- Further, NZCC notes that given differences in context, regulatory frameworks and environments, decisions by international regulatory entities provide limited benefit.[277]

2.4.3 Impact of regulation on risk

All else being equal, 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

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[270] New Zealand Commerce Commission, *Input methodologies review decisions, topic paper 4 cost of capital issues, December 2016, Paragraph 344*

[271] See AER, Final decision AusNet distribution determination – attachment 3 – rate of return – May 2016, pp 38

[272] New Zealand Commerce Commission, *Input methodologies review decisions, topic paper 4 cost of capital issues, December 2016, Paragraph 418*

[273] New Zealand Commerce Commission, *Input methodologies review decisions, topic paper 4 cost of capital issues, December 2016, Paragraph 371.3*

[274] ACCC Inquiry into the east coast gas market, April 2016, P.18-19

[275] Australian Pipeline Gas Association, Submission to the AER, Review of rate of return guideline, 4 May 2018, page 5

[276] New Zealand Commerce Commission, *Input methodologies review decisions, topic paper 4 cost of capital issues, December 2016, Paragraph 434*

[277] New Zealand Commerce Commission, *Input methodologies review decisions, topic paper 4 cost of capital issues, December 2016, Paragraph 442*

variable expected returns than a monopoly business such as the service providers in the provision of regulated services.[278] This is because regulation:[279]

- 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.[280]

We maintain the view that incentive regulation allows service providers to earn more stable cash flows with periodic resets of revenues reflecting changes in actual expenditure.[281] As most unregulated businesses do not have the same protections or restrictions, they are likely to face different risk environments.[282]

Frontier has also recognised the role of regulation in affecting risk in advising:[283]

> 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.

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278 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.

279 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.

280 More precisely, the value weighted average 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. (McKenzie and Partington, *Estimation of equity beta*, April 2012)

281 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.

282 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.

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

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 for example, by allowing cost pass throughs for non-systematic risks such as industry-specific tax changes or geographic-specific natural disasters.

We have previously determined that regulation of energy network services reduces compensable risks such as:

- Demand risk: the revenue or price setting mechanism mitigates demand risk. Under a price cap, service providers may mitigate the risk of forecast e 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, service providers have the possibility to recover for variation through price adjustments in subsequent years.
- Inflation risk: service providers of regulated energy network services face less inflation risk than unregulated businesses, as movements in actual inflation are reflected in the CPI-X mechanism. We reviewed our treatment of inflation in 2017[284], 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. Service providers may further limit their exposure to this risk by raising capital during the averaging period/s that they know in advance.[285] 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.

[284] AER – Final Position paper – Regulatory treatment of inflation – December 2017. Available at: https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/review-of-expected-inflation-2017

[285] Service providers are able to propose future averaging periods for the returns on debt and equity as part of their regulatory proposal for the upcoming regulatory period.

Table 10 below summarises a selection of provisions in the NER and NGR that we consider likely to mitigate various systematic and non-systematic risks.

Table 10 Key clauses in the NGR and NER that mitigate systematic risk

NER	NGR	Effect on risk
6.3.2(b)	50	The term of each regulatory control period is at least 5 years, providing a fixed duration in which a service provider has a regulated return on its assets, cashflow certainty, and fixed terms of access for its services.
6.2.6, 6.5.9	92	This control mechanism automatically accounts for indexation and annual increases in efficient costs. Smooths cashflows from year to year to provide stable level of cash flow, reducing risks of short-term revenue.
6.18	97(5)	The prices service providers 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 cashflow that the AER determines incorporates a return on and of the service provider'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. 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 asset base by reference to the risks faced by the service provider. The AER updates this each regulatory control period to account for changed market conditions.
6.5.3	87A	Provision for tax in determining total revenue is required regardless of whether the service provider pays tax.
6.5.6, 6.5.7	79, 91	The AER assesses expenditure requirements for each service provider by reference to the amount necessary to meet a set of standards and objectives. These include the need to meet the expected demand for services and to meet quality, reliability, security, and safety standards. The AER does not assess expenditure by reference to the capacity of consumers to pay. This removes risks that could otherwise arise in providing a reliable and safe service. The AER reassesses the requirements of service providers for each regulatory period to account for changes in market conditions and trends.
6.5.10	97 (1)(c)	Allows service providers 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	80-86, and 103-104	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) to minimise financial risk associated with providing and charging for services. There is also provision for dealing with potential risks associated with retailer insolvency.
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 service provider and the occurrence of the event could not have reasonably been foreseen by the service provider at the time of the making of the determination.

Source: NER & NGR, AER analysis.

We have received submissions indicating differing opinions on the impact regulation has on the systematic risks faced by service providers. Consumer groups submitted

the view that regulation reduces risks while increases financial benefits.[286] APA submitted that more analysis is required before the characteristics of electricity networks and gas pipelines can be shown to operate with low betas.[287]

We have therefore, looked at the impact of regulation on empirical equity beta estimates. The figure below shows a general trend of increasing beta estimates as the proportion of regulated revenue decreases. This is consistent with the conclusion that regulation lowers a firm's equity beta estimate.

Figure 9 Regulated revenue and beta estimates

Source: Bloomberg; AER analysis

The division between regulated and unregulated is generally based on the most recent publicly available information on the proportion of regulated and non-regulated activities for a financial year. SKI is based on page 90 of its 2017 Annual Report; DUET is based on its 2016 Annual Report;[288] Envestra is based on page 5 of its 2013 Annual Report; AST is based on page 75 of its 2017 Annual Report; GasNet is based on page 3 of its report for the half-year ended 30 June 2016; AAN is based on page 24–25 its 2006 Annual Report;

[286] Consumer Reference Group, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p.28, Energy Users Association of Australia, EUAA submission – AER Rate of Return Review Issues Paper, October 2017, p. 8-9. National Seniors Australia, Issues paper: Review of the rate of return guidelines, December 2017, p.2-3

[287] APA, Submission responding to discussion papers and expert evidence, 4 May 2018, p.16,

[288] In our estimation, Dampier to Bunbury Natural Gas Pipeline (DBNGP) is 100 per cent regulated even though DUET's 2016 Annual Report reported that the ERA's regulatory tariff applies to 15 per cent of the capacity to 2020. This is because the ERA still regulates the pipeline and its regulatory tariffs would apply in the absence of renegotiated Standard Shipper Contracts as indicated by DUET (page 11 of 2016 Annual Report).

AGL is based on page 68 its 2006 Annual Report; APA is based on page 16 of its 2017 Annual Report; HDF is based on page 10 of its 2011 Annual Report.

Business risk

Business risk in this context refers to the systematic risk exposure of the underlying business assets.[289] It is generally accepted that a benchmark efficient entity has lower business risk than the market average firm.[290] We maintain our previous view that business risk for a benchmark efficient entity will be low for the following reasons:[291]

- There are a number of inherent characteristics of an energy transportation network that lead to low systematic risk exposure. For example, operation of a natural monopoly and provision of an essential service with low price elasticity of demand.
- The structure of the regulatory regime insulates service providers from systematic risk. For example, this provides for revenue cap regulation, tariff variation mechanisms and cost pass through mechanisms. This also provides for tariff structures that include fixed charges and protection of sunk investment through rolling forward the regulatory asset base (RAB).

In their 2012 report to the AER, McKenzie and Partington divided business risk into intrinsic risk, and operational risk.[292] Intrinsic risk describes how the business cycle impacts on a firm's sales and operational risk relates to a firm's operating leverage (the proportion of fixed to variable costs).

McKenzie and Partington previously considered that operational risk for the efficient entity would be above the market average given the high proportion of fixed costs for energy networks.[293] However, the overall business risk would be low because a benchmark efficient entity could mitigate the effect of this cost structure through the

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289 We note business risk in this context is only systematic/market risk and does not include firm specific risk that can be diversified away.

290 McKenzie and Partington, *Estimation of equity beta*, April 2012, pp. 6, 10; SFG, *Equity beta: Report for Jemena Gas Networks, ActewAGL and Networks NSW*, May 2014, pp. 17–18. (SFG, *Equity beta*, May 2014); SFG, *Estimating the required return on equity: Report for Energex*, 28 August 2014, p. 60; SFG, *Beta and the Black capital asset pricing model: Report for Jemena Gas Networks, Jemena Electricity Networks, ActewAGL, Ausgrid, Ausnet Services, Australian Gas Networks, CitiPower, Endeavour Energy, Energex, Ergon, Essential Energy, Powercor, SA Power Networks and United Energy*, 13 February 2015, p. 42 (SFG, *Beta and the Black capital asset pricing model*, 13 February 2015); SFG, *Equity beta report prepared for APT Petroleum Pipelines Ltd*, October 2011, p. 11; McKenzie and Partington, *Report to the AER: Risk, asset pricing models and WACC*, June 2013, p. 11; Frontier Economics, *Assessing risk for regulated energy networks*, July 2013, p. 64. McKenzie and Partington, *Report to the AER, Part A: Return on equity*, October 2014, p. 11. Origin Energy, *Submission to NSW distribution network service providers regulatory proposals for 2014–19*, August 2014, p. 7.

291 AER, *Explanatory statement to the rate of return guideline (appendices)*, December 2013, pp. 40–41. Also see: Frontier Economics, *Assessing risk for regulated energy networks*, July 2013; McKenzie and Partington, *Estimation of equity beta*, April 2012, p. 6.

292 McKenzie and Partington, *Estimation of equity beta*, April 2012, pp. 5–6. See also: McKenzie and Partington, *Report to the AER: Risk, asset pricing models and WACC*, June 2013, p. 11.

293 McKenzie and Partington, *Estimation of equity beta*, April 2012, pp. 7, 14.

use of fixed charges. Similarly, intrinsic risk would be very low because a benchmark efficient entity is insulated from the business cycle for reasons listed above.

McKenzie and Partington concluded that the intrinsic risk of a firm is the 'primary, if not sole, driver of its systematic risk.' [294] They reiterated this view in their subsequent reports. [295]

Financial risk

Financial risk relates to the increased systematic risk for equity holders arising from debt holdings, since debt payments take precedence over equity payments. Given their low risk cash flows, service providers might issue a higher proportion of debt than if they were operating in a competitive market.[296] This reduces their cost of capital if debt is cheaper than equity.

It is generally accepted that a benchmark efficient entity has higher financial risk than the market average firm does.[297] The key cause is the relatively high financial leverage for a benchmark efficient entity (60 per cent), relative to the market average firm (about 30 to 35 per cent).

However, the high financial leverage does not necessarily result in an equivalently high financial risk:

- For instance, in their 2014 (and 2015) report, McKenzie and Partington noted for energy network businesses, the likelihood of bankruptcy as leverage increases is low (to the extent that the business is able to pass on borrowing costs to consumers).[298]
- In their 2013 report, McKenzie and Partington also noted that, given the low default risk in regulated energy network businesses, the financial risk effects are 'unlikely to be substantive in normal market conditions'.[299]
- Frontier has also acknowledges that our implementation of a trailing average approach would reduce interest rate reset risk.[300]

Overall risk

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294 McKenzie and Partington, *Estimation of equity beta*, April 2012, p. 14

295 McKenzie and Partington, *Report to the AER, Part A: Return on equity*, October 2014, p. 12; Partington, *Report to the AER: Return on equity (Updated)*, April 2015, p. 32.

296 Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, May 2018, P.4

297 McKenzie and Partington, *Estimation of equity beta*, April 2012, pp. 7, 10; SFG, *Equity beta*, May 2014, pp. 17–18; SFG, *Estimating the required return on equity: Report for Energex*, 28 August 2014, p. 60; SFG, *Beta and the Black capital asset pricing model*, 13 February 2015, p. 42; SFG, *Equity beta report prepared for APT Petroleum Pipelines Ltd*, October 2011, p. 11.

298 McKenzie and Partington, *Report to the AER, Part A: Return on equity*, October 2014, p. 11; Partington, *Report to the AER: Return on equity (Updated)*, April 2015, pp. 31–32.

299 McKenzie and Partington, *Report to the AER: Risk, asset pricing models and WACC*, June 2013, pp. 11–12.

300 Frontier Economics, *Assessing risk for regulated energy networks*, July 2013, p. 74.

We maintain the view that the above assessment suggests that the intrinsic business risk of a firm is the main driver of its systematic risk. We expect a benchmark efficient entity to have low intrinsic risk exposure (relative to the market average). We also consider the high financial leverage of a benchmark efficient entity (relative to the market average) does not necessarily correspond to an equivalently high exposure to financial risk.

The Consumer Reference Group submitted that risks are substantially reduced by regulation and are being continuously reduced and reviewed. [301] It noted, as an example, the recent network tariff reform under the AEMC's Demand Side Participation Review increasing inter-annual and intra-annual revenue smoothing. We acknowledge the CRG's view that risks will continually be reviewed in the future, and that this may impact risks in the future.

Based on this information, we consider there are reasonable conceptual grounds to expect the overall systematic risk for a benchmark efficient entity to be below that of the market average firm. This leads to our expectation that the equity beta of a benchmark efficient entity will be below 1.0. This view is supported in Partington and Satchell's latest (2018) report to the AER. [302]

2.4.4 Interrelationships

In determining the allowed rate of return, we must have regard to any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.[303] The 2013 Guideline described these interrelationships in detail where we have had regard to them in developing our approach.[304]

We maintain the view that one should not view any component or relevant parameter adopted for estimating the rate of return in isolation.[305] This view supported in recent submissions by the CCP16 and NSG.[306] In developing our approach and implementing it to derive the overall rate of return, we are cognisant of a number of interrelationships relating to the estimation of the return on equity and debt and underlying input parameters.

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301 Consumer Reference Group, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p.28.

302 Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, May 2018, P.3.

303 NER, cl. 6.5.2(e); NER, cl. 6A.6.2 (e); NGR r. 87(9).

304 For example, see: AER, *Better regulation explanatory statement rate of return guideline*, December 2013, pp. 15, 20, 158; AER, *Better regulation explanatory statement rate of return guideline (appendices)*, December 2013, pp. 12, 25–26, 51, 78, 166

305 For example, see: AER, *Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return*, November 2017, p. 40

306 Network Shareholder Group, Submission on the Rate of Return Guideline review, May 2018, p.12, Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline review concurrent evidence sessions, p. 6

Importantly, the principles set out in this paper regarding 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 particular data may mean that the consistent application of these principles may result in different datasets being used for different parameters.

2.5 Summary of submissions

This section details the submissions we have received from stakeholders as part of our review process to date, and notes how we have had regard to each submission.

Table 11 Summary of submissions on compensable risk

Key Point	Submission	Stakeholder	AER response
Different Beta for gas and electricity	Gas and electricity businesses face different risks	APA,[307] Greg Houston[308], Ian McAuley [309]	We view that while gas and electricity businesses may face different risks, the regulatory framework mitigates risk sufficiently so that the differences in residual risk after regulation are immaterial. While there is no theoretical reason that the beta of regulated gas and electricity should be the same, there was no agreement from the concurrent evidence session on whether equity beta should be different for different types of businesses. Experts noted that differences in businesses do not necessarily translate into rate of return but potentially opex allowance. Our empirical analysis is based on a comparator set which includes gas service providers, which will capture any potential differences in systematic risks between gas and electricity service
	Differences in gas and electricity risks cannot be measured reliably	Partington[310] CCP.[311]	
	There are upside risks to consider.	Johnstone[312]	
	Differences in risk may be both systematic and non-systematic and may be differences in Opex.	Gray[313]	
	Empirical evidence from NZCC's 2016 Decision provides new support for a gas differential.	APGA[314]	
	Differences in businesses (such as labour costs) do not have to translate into rate of return, but rather opex.	Sadeh[315]	
	No theoretical reason that beta of regulated gas and electricity should be the same. Nor is this required by the NER or the NGR	APGA[316],	
	NZCC shows the asset	APGA[317]	

307 APA, AER Rate of return issues paper, 12 December 2017, p. 5
308 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 56
309 Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 1
310 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018. p. 57
311 Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 82.
312 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 57
313 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 58
314 Australian Pipeline and Gas Association, Submission to issues Paper: AER Review of the rate of return guideline, 12 December 2017, p.3
315 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 58
316 Australian Pipeline and Gas Association, Submission to the AER, Review of rate of return guideline, 4 May 2018, p. 17

Key Point	Submission	Stakeholder	AER response
	betas of US regulated gas businesses are above electricity businesses.		providers. We reviewed the NZCC decision document and do not view it to be relevant to our task. The NZCC itself highlighted that the factors supporting an uplift in the gas beta are not sufficient in isolation. Additionally, the decision appears to be based on a number of NZ specific factors.
	Transmission and distribution pipelines service different user bases. The risks of service provision using transmission pipelines are different from those of distribution pipelines with their extensive, and usually diversified, end-user populations. The costs of financing pipeline investment are therefore different across transmission pipelines, and between transmission pipelines and gas distribution pipeline systems.	APA[318] Ian McAuley[319]	
	Issue was considered in 2013, no new evidence presented	CCP[320] ECA [321]	Did not include due to new evidence of NZCC.
Technological risk	Emerging tech has increased structural changes in energy markets	Cheung Kong Infrastructure[322]	We consider technological, risks are not compensable through the rate of return because they are not systematic and are diversifiable. To the extent that there are impacts on systematic risks, beta will reflect the systematic component. Additionally, we agree with the CCP that should these
	2013 Guidelines were based on assumption that energy markets face limited competition	ENA[323]	
	Seems diversifiable	Partington[324], CCP16[325]	
	Potential to be covered in OPEX	Gray[326]	

317 Australian Pipeline and Gas Association, Submission to the AER, Review of rate of return guideline, 4 May 2018, p. 5

318 APA, Submission responding to discussion papers and expert evidence, 4 May 2018, p.17

319 Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p.1

320 Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 45

321 Energy Consumers Australia, Review of the rate of return guideline, December 2017, p.15-18

322 Cheung Kong Infrastructure, Submission to issues paper: AER Review of rate of return guideline, December 2017, p. 34

323 Energy Networks Australia, Submission to issues paper: AER Review of rate of return guideline, December 2017, p. 7

324 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 47

325 Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 37

326 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 52

Key Point	Submission	Stakeholder	AER response
	Investors haven't factored in technology risks because they don't know.	Sadeh[327]	risks result in stranding risk, the risks are borne by consumers.
	There is upside risks	Gray[328], Johnstone [329]	
	Some elements may affect markets as a whole and should be reflected	Sadeh[330]	
	If systematic component will come through beta, we have to look at the more recent evidence	Gray[331]	
	Borne by consumers rather than service providers as assets cannot be stranded.	CCP16[332]	
	Tech risk identified partially due to attitude to reduce carbon emission and unrelated to economic cycle	CCP16[333]	
	Investors in other industries affected by changes in tech do not receive assistance.	CCP16[334]	
	The view that technological risk is systematic is unproven.	CCP16[335]	
	Any change in systematic risk from tech will take time to reflect in beta.	Evoenergy[336] APA[337]	
	Tech risk will affect gas businesses too.	APA[338]	
	Technological risks may be	Jemena[339]	

[327] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 50
[328] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 53
[329] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 58
[330] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 18
[331] AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 54
[332] Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 37
[333] Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 44
[334] Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 44
[335] Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 44-46
[336] Evoenergy, Review of rate of return guideline –evidence sessions, 4 May 2018, p. 2
[337] APA, Submission responding to discussion papers and expert evidence, 4 May 2018, p. 16
[338] APA, Submission responding to discussion papers and expert evidence, 4 May 2018, p. 16

Key Point	Submission	Stakeholder	AER response
	non-systematic and may require compensation through cash flows		
Catastrophic risks	Entities can buy insurance, passing into operating costs.	Houston[340] Ian McAuley[341]	We consider catastrophic risks are not compensable through the rate of return because they are not systematic and are diversifiable. The risks can also be mitigated by the option to purchase insurance, with costs flowing through to Opex allowance. In extreme situations, catastrophic risks can be mitigated via the potential to pass the costs to relevant users and shipwreck clauses.
	Compensating for risks unrelated to the market would be departing from the CAPM framework	Johnstone[342]	
	Non-systematic risks can be captured elsewhere in framework, e.g. Opex. Otherwise should be compensated in AROR	NSG[343]	
	Entities can buy insurance, passing into operating costs.	Houston[344]	
	Ensure all risks are accounted for in establishing returns required by investors whether through beta, cash flow or the regulatory framework.	NSG[345], Gray[346], Houston[347] ENA[348]	We acknowledge that risks will be continually reviewed in the future, and that this may impact risks in the future.
Regulatory risk	Australian Governments have increased threat of intervention. If risks are not reflected in rate of return, there will be impacts to investment.	NSG[349] APA[350]	We consider regulatory risks are not compensable through the rate of return because they are not systematic and are diversifiable. To the extent compensation is deemed necessary, we consider it
	Compensation for policy changes is a decision for	CCP[351] Ian McAuley[352]	

339 Jemena, Submission on concurrent expert sessions and discussion papers, 4 May 2018, p. 3
340 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 59
341 Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p.3
342 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 48
343 Network Shareholder Group, Submission on the RoRG review, May 2018, p.8
344 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 59
345 Network Shareholder Group, Submission on the RoRG review, May 2018, p.10
346 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 9
347 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 19
348 Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions, May 2018, p. 7
349 Network Shareholder Group, Submission on the RoRG review, May 2018. P.7
350 APA, Submission responding to discussion papers and expert evidence, 4 May 2018, p.16
351 Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 45
352 Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 3

Key Point	Submission	Stakeholder	AER response
	government, not the regulator.		should be determined by the government. Additionally, we agree with CCP's submission that the argument that policy risks are systematic is tenuous and unproven.
	Prospect of rule change is highly uncertain. Need to go through separate powers between AER, AEMC and ministerial council and governments.	CCP[353]	
	Political, regulatory and sovereign risk is low.	ECA[354]	
WACC/ CAPM framework	CAPM is not appropriate to model risk	Johnstone[355]	We are of the view that the SLCAPM framework is the best approach to reflect the systematic risk of a BEE. We consider efficient financing costs 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 in respect of the provision of regulated energy network services. Beta and systematic risk are relatively stable over the long term. This view is shared by a variety of stakeholders and the majority of experts. We acknowledge that short term fluctuations may arise from risks unrelated to that of a service provider, hence we place more weight on long term
	Current model and rules should be maintained.	NSG[356] ENA[357] APGA[358]	
	Support WACC, SLCAPM, BEE. These principles lowers cost of capital	NSG[359]	
	A more fundamental review is required. Major issues with CAPM. Likely to overestimate the required rate of return as it ignores revenue from other sources (such as incentives).	CRG[360]	
	CAPM draws from competitive markets and reflects competitive markets, not monopolistic regulated markets	CRG[361] Ian McAuley[362] Canegrowers[363] MEU[364]	
	Whether using an equity beta based on the relative volatility of share prices in the stock market (where investors face all of the	CRG[366]	

353 Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 44

354 Energy Consumers Australia, Review of the rate of return guideline, December 2017, p. 26

355 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 47

356 Network Shareholder Group, Submission on the RoRG review, May 2018, p. 8

357 Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions, May 2018, p. 8

358 Australian Pipeline and Gas Association, Submission to the AER, Review of rate of return guideline, 4 May 2018, p. 2

359 Network Shareholder Group, Submission on the RoRG review, May 2018, p. 7

360 Consumer Reference Group, Submission to the AER RoRG review, May 2018, p. 37

361 Consumer Reference Group, Submission to the AER RoRG review, May 2018, p. 36

362 Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 3

363 Canegrowers, Submission to AER review of the rate of return guideline, December 2017, p. 4

364 Major Energy Users, Review of the rate of return guidelines, December 2017, p. 7

Key Point	Submission	Stakeholder	AER response
	systematic risks) is an appropriate measure to assess the underlying risk faced by the network firm where these systematic risks have been mitigated through the rules.365		estimation periods. It is not clear that we should adjust the rate of return above or below the SLCAPM estimate to reflect potential shortfalls as the adjustment reflects ex-post performance.
	AER should examine risks through a bottom up analysis.	PIAC[367]	
	The stocks used in AERs sample are considered defensive. Volatility may be market sentiment more than fundamental risk.	CRG[368]	
	SLCAPM is an average expected return. Allowed return should be increased to cover for uninsurable risks.	ENA[369]	
	Need to consider upside risks. Such as incentive bonuses schemes.	CCP[370]	
	Beta is an indicator of volatility, and irrelevant over long term.	Ian McAuley[371]	
	A Beta can be 0	Ian McAuley[372]	
	There is potential for bias in analysis and some useful data is unavailable due to imperfect information.	NSA[373]	
	The CAPM implies that the returns the network firm generates from its normal activities would have to, at least, match the returns that	CRG [374]	

366 Consumer Reference Group, Submission to the AER RoRG review, May 2018, p. 36
365 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 36
367 Public Interest Advocacy Centre, Submission on rate of return guideline review issues paper, 18 December 2017, p. 2
368 Consumer Reference Group, Submission to the AER RoRG review, May 2018, p. 47
369 Energy Networks Australia, AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Evidence Sessions, May 2018, p. 30
370 Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 43
371 Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 2
372 Ian McAuley, Submission to AER on rate of return guidelines, December 2017, p. 2
373 National Seniors Australia, Issues Paper: Review of the rate of return guidelines, December 2017, p. 2
374 Consumer Reference Group, Submission to the AER RoRG review, May 2018, May 2018, p. 37

Key Point	Submission	Stakeholder	AER response
	firm might gain from investing in the stock market. This concept is flawed.		
BEE	BEE is important to the framework. Opportunity to outperform is crucial to incentives.	Sadeh[375] Houston[376] NSG[377]	We consider the concept of a BEE is an important reference point for our regulatory task. We define a BEE as having a similar degree of risk as a service provider in the provision of regulated energy network services. We use market data for firms that we consider are reasonable and closest comparators of a BEE.
	No such thing as allowed return equal to efficient cost of a BEE, as efficient cost of financing depends on characteristics of the cash stream, which is determined by the regulator.	Johnstone[378]	
	Unsure what efficient financing structure of a BEE is. You can't rebalance every 5 years. Some firms make the choice to hedge, some don't.	Partington[379]	
	Important to judgement/discretion. Benchmarking removes the AER from making decisions and getting involved.	Sadeh[380], Johnstone[381]	
	Companies used in estimating a BEE have unregulated revenues. This affects risk reductions.	CRG[382] MEU[383]	
Regulation mitigates risk	the very substantial risk reductions under the rules mean that economic and financial risk (the top left boxes) for regulated entities	CRG[384] [385] EUAA[386] NSA[387]	We agree that regulation mitigates substantial amounts of systematic risks and have analysed

375 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 13
376 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 13
377 Network Shareholder Group, Submission to evidence session, May 2018, p. 5
378 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 18
379 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 20
380 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 12
381 AER Concurrent Evidence Session 1 – Proofed Transcript, April 2018, p. 16
382 Consumer Reference Group, Submission to the AER RoRG review, May 2018, p. 26
383 Major Energy Users, Review of the rate of return guidelines, December 2017, p. 7–8
384 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 28.
385 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 37
386 Energy Users Association of Australia, EUAA submission – AER Rate of Return Review Issues Paper, October 2017, p. 8-9
387 National Seniors Australia, Issues paper: Review of the rate of return guidelines, December 2017, p. 2-3

Key Point	Submission	Stakeholder	AER response
	are almost entirely neutralised the very substantial risk reductions under the rules mean that economic and financial risk (the top left boxes) for regulated entities are almost entirely neutralised		regulation's impact on beta
	more careful analysis is required before the characteristics of electricity networks and gas pipelines can be shown to operate, in the circumstances of a specific network or pipeline, to deliver a low β	APA[388]	
Stranding risk	The Guideline should be explicit about its treatment of the risk of stranding risk	ENA[389]	To the extent that there are genuine risks of extreme changes in demand for specific service providers which present the potential for asset stranding, the regulatory regime for gas and electricity can mitigate the risk by providing prudent discount and accelerated depreciation provisions. the CCP also stated that consumers bear the risk of the underutilised assets, as the full costs of the assets must continue to be reflected in the regulated revenues and prices We have consistently and transparently set out our approach for examining risk, MRP and beta. For example, AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, we list out our criteria of assessing
	Stranding risk is borne by consumers.	CCP[390] EUAA.[391]	
	More emphasis need to be on an examination of the risks networks face and whether the market risk premium and beta accurately reflect that risk allocation	EUAA.[392]	

[388] APA, Submission responding to discussion papers and expert evidence, 4 May 2018, p. 16

[389] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 7, 30

[390] Consumer Challenger Panel 16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, 4 May 2018, p. 44-46.

[391] Energy Users Association of Australia, EUAA submission – AER Rate of Return Review Issues Paper, October 2017, p. 8

[392] Energy Users Association of Australia, EUAA submission – AER Rate of Return Review Issues Paper, October 2017, p. 5–6.

Key Point	Submission	Stakeholder	AER response
			information.
The use of market data	Concerned with transparency in regulation and use of available data	EUAA[393]	We maintain the view that economic efficiency is advanced by employing a rate of return that reflects rates in the market for capital finance.[394] Partington and Satchell have also interpreted efficient financing costs as the opportunity cost of capital, which is a market rate of return for assets with a given level of risk.[395]
	Market data reflects risk/returns greater than that of regulated assets	ECA[396]	
	Consider risk on an asset basis and not at a business level	ECA[397]	
	Volatility in market data/Share price may be related to market sentiment rather than fundamental characteristics	CRG[398]	
Interrelationships	Components and parameters for the rate of return should not be viewed in isolation.	CCP16[399] NSG[400]	We maintain the view that one should not view any component or relevant parameter adopted for estimating the rate of return in isolation. In developing our approach and implementing it to derive the overall rate of return, we are cognisant of a number of interrelationships relating to the estimation of the return on equity and debt and underlying input parameters

393 Energy Users Association of Australia, EUAA submission – AER Rate of Return Review Issues Paper, October 2017, p. 5–6.

394 For example, see: AER, Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return, November 2017, p. 12, 16. AER, Final decision United Energy distribution determination 2016 to 2020 Attachment 3–Rate of return, May 2016, pp. 281–292.

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

396 Energy Consumers Australia, Review of the rate of return guideline, December 2017, p. 20.

397 Energy Consumers Australia, Review of the rate of return guideline, December 2017, p. 15–18.

398 Consumer Reference Group, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 47

399 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline review concurrent evidence sessions, p. 6

400 Network Shareholder Group, Submission on the Rate of Return Guideline review, May 2018, p.12

3 Form and structure of the rate of return guidelines

We have implemented the approach outlined in section 2 to achieve the legislative objectives by developing rate of return guidelines that:

- calculate an allowed rate of return in the form of a nominal, vanilla, weighted average cost of capital that is consistent with the value of imputation credits and does not include transaction costs involved in raising capital
- are capable of being automatically applied without exercise of discretion.

These aspects about the form and structure of the rate of return guidelines are discussed further in the sections 3.1 and 3.2 below.

In addition to estimating the rate of return as a nominal vanilla WACC, stakeholders submitted that we should consider other information that could act as a cross check on the overall level of the rate of return. We consider the role of this information in section 3.3 below.

3.1 A 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:

$$WACC = E(k_e)(1 - G) + E(k_d)G$$

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.

Under the current regulatory framework we must determine the rate of return on this nominal, vanilla, weighted average basis that is consistent with the estimate of the value of imputation credits.[401] We also understand that we will be required to determine

[401] NER, cl. 6.5.2(d); NER, cl. 6A.6.2(d); NGR, r, 87(4).

the allowed rate of return on this basis under COAG's draft legislation for the implementation of a binding rate of return instrument.[402]

In any case, 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 the achievement of 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.
- This has been our long-standing 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 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.

Estimating a weighted average of the returns on debt and equity that is consistent with the value of imputation credits requires us to estimate:

- The return on equity

  Our estimation approach for this parameter is set out in chapter 5, and our estimation of individual return on equity parameters are set out in chapters 6 (risk free rate), 7 (market risk premium), and 8 (equity beta).
- The return on debt

  Our estimation approach for this parameter is set out in chapters 9 and 10.
- The benchmark gearing ratio

  Our estimation of this parameter is set out in chapter 4.
- The value of imputation credits

  Our estimation of this parameter is set out in chapter 11.

In the next section we outline how the guidelines can be automatically applied to calculate each of these elements.

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[402] CoAG EC, *Draft legislation to create a binding rate of return instrument*, 02 March 2018; and CoAG EC, *Bulletin, Binding rate of return guideline,* June 2018.

3.2 Automatic application

Legislative amendments have been proposed that would make these guidelines binding. In the draft legislation we are required to make a binding rate of return instrument that either sets a value for the rate of return on capital and value for imputation credits, or sets a formula for the calculation of the rate of return and the value of imputation credits. If we set a formula rather than a value then the formula must be capable of being automatically applied during the life of the guideline, without any exercise of discretion.[403] We cannot set different methodologies or a band of values from which we can choose at the time of applying the guideline in a regulatory determination. [404]

In light of CoAG's commitment to implementing a binding rate of return guideline, we have developed guidelines that are capable of either:

- operating as non-binding guidelines under the current legislative framework; or
- being automatically applied as a binding rate of return instrument if the legislative framework changes.

Implementing this approach, our decision is to make guidelines that set:

- 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 (as set out in section 3.1 above). For each input into this formula, we set:
    - The return on equity as a formula, being the Sharpe-Lintner Capital Asset Pricing Model (SLCAPM) 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 part debt data.
    - A fixed value for the benchmark gearing ratio.
- A fixed value of imputation credits (gamma).

Within these formulas, we also set out how the calculation of the allowed rate of return and its various elements will change under certain events or contingencies, such as if a particular data source is no longer available.

We will implement our formula for calculating the rate of return by setting out:

- The use of the SLCAPM to calculate the return on equity with a fixed value for the market risk premium of 6 per cent and a fixed value for equity beta of 0.7. This results in a fixed equity risk premium of 3.6 per cent, which will be added to the risk free rate calculation.

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[403] CoAG EC, *Draft legislation to create a binding rate of return instrument*, 02 March 2018; and CoAG EC, *Bulletin, Binding rate of return guideline,* June 2018.

[404] *Statutes Amendment (National Energy Laws) (Binding Rate of Return Instrument) Bill 2018*, cl.18 and 30.

Our discussion paper on this topic noted that this was the first time we are applying this automatic approach for the life of the instrument. That paper did not set out how we might assess whether we should set a value or a formula. We asked whether it is appropriate to include self-executing formulas (mechanistic/automatic) where only the data is entered at the time of application. We set out our initial views on whether our current approach to return on debt, return on equity, gamma, and gearing ratio is amenable to mechanistic application over the life of the guideline. Our initial view in the discussion paper was, other than the approach to estimating the return on equity, all other aspects were amenable to mechanistic application.[405]

The expert joint report on the concurrent evidence sessions reported the following agreed positions:

- According to the draft legislation the AER cannot exercise discretion in the way it calculates the rate of return during individual price/revenue determinations, but it could exercise discretion during the development of the Instrument. This means that the AER is required to either
    - fix parameters as part of the Instrument, or
    - provide a way for a parameter to be computed mechanistically and objectively so that it is commensurate with the market conditions at that time.[406]
- Parameters that are relatively stable over a long period (regulatory period or more) should be fixed. Also, where data taken at a given point in time is not suited for estimating the parameter value, then such should also be fixed. Hence, equity beta and gearing should be fixed. That is, equity beta is relatively stable over a long period of time and gearing information at a specific point in time is not suitable for estimating the value of gearing. [407]

Where market variables influence the appropriate value at a given time then such parameters should be set via a prescriptive methodology. Hence, the risk free rate and cost of debt should be a prescriptive methodology based on market evidence.[408]

In relation to the market risk premium, the expert joint report appeared to indicate agreement that the market risk premium is neither constant nor directly inversely related to the risk free rate. However, given the uncertainty on how to model the correlation between the market risk premium and risk free rate, most experts considered it appropriate to fix the value of the market risk premium. One expert's view

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405 AER, *Discussion paper, MRP, risk free rate averaging period and the automatic application of the rate of return*, March 2018, section 7.

406 Joint Expert Report, *RORG review – Facilitation of concurrent evidence sessions*, CEPA, 21 April 2018, section 2.1.1, p.12.

407 Joint Expert Report, *RORG review – Facilitation of concurrent evidence sessions*, CEPA, 21 April 2018, section 2.10, p.17.

408 Joint Expert Report, *RORG review – Facilitation of concurrent evidence sessions*, CEPA, 21 April 2018, section 2.10, p.17.

was that a formula for calculating the market risk premium that is dependent on the risk free rate should be developed. This expert was concerned that a fixed value of the market risk premium may result in the allowed return on equity being too high when the risk free rate is high and too low when the risk free rate is low.[409]

We also considered other stakeholder submissions in arriving at our draft decision (see section 3.4 for a summary of submissions).We agree with the consensus in the expert joint report that parameters that are relatively stable over a long period (such as a regulatory period or more) should be fixed. We also agree that where market variables influence the appropriate value at a given time then such parameters should be set via a prescriptive methodology. Other stakeholder submissions also support the experts' consensus opinion.

We applied the above assessment approach agreed to by the experts in exercising our judgement on what should be fixed as a value or as a prescriptive methodology. Applying this assessment approach will provide for the rate of return guidelines to be commensurate with efficient finance cost and most likely contribute to the achievement of the legislative objectives. The following subsections set out how we have applied this assessment approach when considering each of the parameters for the rate of return and value of imputation credits: the benchmark gearing ratio, the return on equity, the return on debt, and the value of imputation credits.

3.2.1 Gearing

Our decision is to set a fixed gearing value in the guidelines.

All experts agreed that conceptually gearing should not change regularly as the core capital structure decisions of companies are stable and there is a cost to changing capital structure in response to regulatory gearing changes.[410] The experts agreed that spot gearing values are distorted by short term market fluctuations and therefore data should be averaged over a longer period of time.[411] On this basis, the experts agreed that gearing data at a point (spot values) in time is not appropriate to be used in setting the rate of return. Rather, a historical average should be determined and fixed for the life of the guidelines.[412] Other stakeholders also support the experts' consensus opinion.[413]

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409 Joint Expert Report, *RORG review – Facilitation of concurrent evidence sessions*, CEPA, 21 April 2018, section 6.13, p.64.

410 Joint Expert Report, *RORG review – Facilitation of concurrent evidence sessions*, CEPA, 21 April 2018, section 3.02, p.28.

411 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.

412 Joint Expert Report, RORG review – *Facilitation of concurrent evidence sessions*, CEPA, 21 April 2018, section 2.10, p.17.

413 NSG, *Submission on the RORG review*, 4 May 2018, p.13; Evoenergy, *Review of the rate of return Instrument – evidence sessions*, 4 May 2018; CCP, *Submission to the AER on its RORG review concurrent evidence session*, 4 May, 2018, pp.16-17.

Our gearing estimate in the guidelines is based on a historical average (see section 4 for a detailed discussion on our gearing estimate). We agree with the experts 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 as short term gearing data can be distorted by market fluctuations in share prices. We therefore consider it appropriate to fix a value for gearing in the guidelines.

3.2.2 Return on equity

Our decision is set in the guidelines a formula - based on the SLCAPM - to calculate the return on equity. Within the SLCAPM formula, our decision is to set fixed values for market risk premium and equity beta, and set a formula for calculating the risk free rate.

In our 2013 guidelines our approach to estimating the return on equity was based on our foundation model approach.[414] Our draft decision continues this approach through use of the SLCAPM formula to calculate the return on equity and through our approach to determining the inputs into the SLCAPM formula (see chapter 5 for further detail on our return on equity approach).

In our discussion paper we set out three options on how we could automate the return on equity:

- Setting a fixed value for the rate of return on equity.
- Setting a fixed value for the equity risk premium[415] to be used with a risk free rate that is commensurate with the timing of each regulatory determination.
- Setting out a methodology that allows some or all of the SLCAPM parameter inputs to vary during the period of the guidelines.

The concurrent expert evidence sessions, joint expert report, and submissions in response focussed on option 2. Within that option the discussion was largely on whether the market risk premium should be fixed. Experts unanimously agreed that:

- The value for equity beta should be fixed as it is stable over long periods.
- The risk free rate for the SLCAPM should be set as a methodology as market variables influence its appropriate value.[416]

We consider that setting a fixed value for equity beta in the guidelines will best contribute to the legislative objectives and we have not received any submissions that hold a contrary view. We also consider empirical equity beta data is relatively stable

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414 AER, Rate of return guideline, December 2013, section 5. Available at: https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/rate-of-return-guideline-2013 .

415 We refer to the product of the MRP and equity beta in the SL-CAPM formula as the equity risk premium.

416 Joint Expert Report, *RORG review – Facilitation of concurrent evidence sessions*, CEPA, 21 April 2018, section 2.10, p.17.

over long periods, consistent with the experts' views.[417] We also agree that the risk free rate is influenced by variations in the market and should be determined by a prescribed methodology that captures these variations. This is also consistent with submissions to us.[418]

The experts at our concurrent expert evidence sessions considered whether it was appropriate to set a formula for calculating the market risk premium that would be applied over the life of the guidelines. The reason why they considered this was because all experts agreed that the market risk premium is neither constant nor directly inversely related to the risk-free rate. However, given the lack of an accepted model of the correlation between the market risk premium and the risk free rate, most experts considered it more appropriate to fix the market risk premium. [419]

At the concurrent expert evidence sessions, Prof Stephen Gray stated that we have 3 options. These are:

- fix the market risk premium, which is added to the observed risk free rate
- fix the total market return, such as uses by UK regulators
- fix the total market return at the commencement of the instrument and apply a formula that adjusts the total market return in proportion to movements in the observed risk free rate

In respect of the third option, Prof. Gray suggested that for example we adjust total market return by a fixed percentage of the movement in the risk free rate.[420] Prof. Gray noted that experts might consider whether the AER's current approach to date, which in his view is to fix the market risk premium, results in a return that is too high (low) when the risk free rate is high (low).[421]

We agree with most of the experts that it is more appropriate to set a fixed value for the market risk premium in the guidelines. There is no accepted theoretical basis to support a market risk premium that varies within lock-step with the risk free rate nor is there a robust basis by which to calculate the appropriate adjustment to the market risk premium in line with changes to the risk free rate. More importantly, we consider that an approach which promotes a stable return on equity may not be suitable for a regulatory model which resets every 5 years. A fixed value of the market risk premium

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417 Joint Expert Report, RORG review – *Facilitation of concurrent evidence sessions*, CEPA, 21 April 2018, section 2.10, p.17.

418 NSG, *Submission on the RORG review*, 4 May 2018, p.13; Jemena, *Submission on concurrent evidence sessions and discussion papers*, 4 May 2018.

419 Joint Expert Report, RORG review – *Facilitation of concurrent evidence sessions*, CEPA, 21 April 2018, section 6.13, p.64.

420 AER, *CES session 1 proofed transcript*, 15 March 2018, p.11.

421 Joint Expert Report, RORG review – *Facilitation of concurrent evidence sessions*, CEPA, 21 April 2018, section 6.13, p.64.

which is reset every 5 years is more likely to remain unbiased and reduce risk of over/under investment.[422]

In the absence of a robust basis to determine how the market risk premium should vary over time, we consider setting a formula for the market risk premium is not appropriate. Such an approach would lead to arbitrary changes in the market risk premium, which is not founded on good finance principles nor supported by robust analysis. Outcomes from such an approach are not commensurate with efficient financing costs.

We do not use the approach of setting a fixed value for the total market return as our foundation model approach and do not consider we should adopt it in a guideline that may be applied automatically.[423] Setting a fixed value for the total market return is equivalent to adopting a particular formula to setting the market risk premium based on the total market return and the (variable, market-driven) risk free rate. As noted above, we consider that there is no accepted theoretical basis for modelling the correlation between the risk free rate and the market risk premium. Further, if the risk free rate increases (decreases) when the total market return is a fixed value, then the resulting shrinking (increasing) equity risk premium may not compensate (over compensate) service providers for systematic risk. We consider a return on equity comprising a variable risk free rate and a fixed equity risk premium provides the certainty and predictability that all stakeholders require.

3.2.3 Return on debt

Our decision is to set a formula for calculating the allowed return on debt. This is the same approach as that adopted in our 2013 guidelines. Under the current rules framework, an annually updating return on debt is required to be given effect by automatic application of a formula. For this reason, our view is that implementation of a binding rate of return instrument requires only incremental changes to our current approach.

Our decision is to set a formula that calculates the return on debt reflective of a benchmark credit rating and term to maturity, and based on data from third party data providers.

In our discussion paper, our initial view was that the return on debt approach in our 2013 guidelines is amenable to automatic application. We did not receive any submissions indicating that our approach to date is not suitable for automation.

Debt data from third party data providers fluctuates over time with market conditions. However, the availability of the data providers themselves, the benchmark credit rating, and benchmark term of debt are relatively stable over time. Observed values for these parameters, particularly credit rating and debt term, may change over time, as service

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[422] See our chapter 7 of this draft decision.

[423] This total market return approach is sometimes referred to as the Wright approach, which we discuss in chapter 7 of this draft decision.

providers react to market conditions, deal with legacy debt arrangements, and take time to adjust to financing practices to target levels. We have observed changes in actual debt term of service providers since previous reviews in 2009 and 2013. However, we consider that the benchmark efficient term is likely to be relatively stable.

3.2.4 Value of imputation credits

Our approach to date to estimating the value for imputation credits (gamma) is set out as the product of the payout ratio (the proportion of imputation credits generated by the benchmark efficient entity 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).We choose a value of 0.5 for gamma from within a range of 0.3 to 0.6 based on an utilisation rate of 0.6 and a distribution rate of 0.83.[424]

We consider the utilisation rate and the payout ratio parameters do not change quickly and also see no reasons to expect movement up or down. Therefore, it is appropriate to fix the value of imputation credits for the life of the guideline.

3.3 Role of financial performance measures

Stakeholders submitted that we should consider information that could act as a cross check on the overall reasonableness of the rate of return:

- the CCP16, CRG, MEU, Ergon Energy and Energex submitted that we should consider RAB multiples
- the CCP16, CRG, MEU, PIAC, ECA, EUAA, QCOSS, Origin Energy, Agricultural Industries Energy Task Force, QCOSS, ATCO Gas Australia, Ergon Energy and Energex submitted that we should consider historical profitability measures
- the CCP16, ENA, Origin Energy, Ergon Energy and Energex and ATCO Gas Australia submitted that we should consider financeability assessments.

These three types of overall financial performance measures are discussed in turn below.

Overall, we consider that these measures cannot be used to directly determine parameter estimates for the allowed rate of return. We agree with the CCP16 submission that there is difficulty in disaggregating the information contained in RAB multiples and historical profitability measures to determine the degree of outperformance of the allowed rate of return.

However, we consider that there may be useful information within the trends in RAB multiples and historical profitability measures over time. Comparisons of RAB multiples and historical profitability measures can provide information on the performance of the regulatory system as a whole. This information may be helpful in considering whether

[424] See our chapter 11 for further detail.

the business' actual rate of return has been systematically lower or higher than the allowed rate of return.

The CCP16 submitted that this information cannot be used at a parameter level but can inform the overall exercise of judgement in setting the rate of return or reviewing other elements of the regulatory regime[425]. We agree that RAB multiples and historical profitability may provide useful contextual information and cause for further examination of the material we rely on when estimating rate of return parameters (other elements of the regulatory regime are beyond the scope of this review). We have done this as part of this review through further consideration of the impact of regulation on equity beta estimates within our comparator set (see sections 2.4.3 and 0), examination of service providers' actual debt issuances (see sections 10.2, 10.3, and 10.5), and further consideration of the most appropriate third-party debt data to reflect our benchmark credit rating (see section 10.1). Though outside the scope of this review, we are also currently undertaking reviews of other parts of our regulatory regime, such as our review of our regulatory tax approach and review of profitability measures for gas and electricity businesses.

3.3.1 RAB multiples

RAB multiples are the enterprise value of a firm divided by its Regulatory Asset Base (RAB). It can be calculated using two main sources of data to evaluate the market value of equity in service providers:

- Acquisition data – the purchase price when a transaction[426] of the service providers occurs, or
- Trading data – the existing share price of a business that has an equity ownership in a service provider.

Subject to satisfying several conditions, a RAB multiple of 1 may indicate that the present value of the future stream of expected cash-flows of the firm is equal to its RAB. This means that investors are compensated exactly at a level to encourage efficient investment.

Our 2013 Guidelines do not incorporate RAB multiples, nor have we used RAB multiples in our decision making for any regulatory determinations. In developing our 2013 Guidelines we considered the potential use of RAB multiples to inform our decision making, however, we decided not to use them. In our 2013 Rate of Return Guidelines we stated that:

> We propose to not apply levels and changes in RAB acquisition and trading multiples as a direct reasonableness check on the overall rate of return at the

[425] Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, pp 27-28.

[426] A transaction may only involve the purchase of a certain portion of equity in a service provider, in which case, an implied RAB multiple can be calculated based on the price paid for the percentage of shares acquired.

> time of a particular revenue determination or access arrangement. Instead, we propose to use these multiples as part of a set of indicators that we monitor over time and across network businesses to help inform us of potential areas of inquiry and research. This more general use of these multiples reflects the fact that there are many potential influences on RAB acquisition and trading multiples, such as changes in the expectations and the realisations of business revenues, expenditures and rates of return. Given these many potential influences, any changes in these multiples may not be immediately attributable to any one factor.[427]

In our Issues Paper for the 2018 rate of return guideline review, we noted stakeholder submissions from previous consultations, that asset sales should be used as potential tests of whether the allowed rate of return is achieving the national gas and electricity objectives[428]. We also discussed the difficulties in using RAB multiples from asset sales as they may be indicative of other elements of the firm's cash flows and that they do not provide a definitive answer to the specific return investors require. However, we did note that if RAB multiples significantly and persistently differ from one, then it may be informative of the reasonableness of our overall building block allowances and our overall rate of return estimates over time.

We therefore invited submissions on whether information on asset sales should be used when assessing outcomes against the NEO, NGO and the related RPPs.

Given the submissions from consumer groups in support of using RAB multiples to inform the rate of return, we decided to revisit the issue. Therefore, we also included RAB multiples for discussion in our first Concurrent Expert Evidence Session, and released a Discussion Paper[429] prior to the session and invited stakeholder submissions.

Throughout our consultation process, the network businesses have not been in favour of the use of RAB multiples to inform the rate of return – primarily due to the difficulty in disaggregating the RAB multiples into its different sources of value. However, as mentioned previously, consumer groups have been in favour, mainly highlighting that the rate of return is a large component of the building block revenue, and the large multiples observed, particularly in recent transactions, are suggestive that the rate of return has been too generous.

Our draft decision is not to use RAB multiples to inform our rate of return. This is consistent with the approach we adopted in the 2013 Guidelines. After considering all the submissions and experts' views provided as part of this review, we consider that there is still much subjectivity and no agreement from experts, in terms of the appropriate assumptions to use to disaggregate these multiples. We also note recent developments in the UK, with the decomposition of RAB multiples for particular utilities,

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427 AER, Rate of Return Guideline - Explanatory Statement, December 2013, p 48.

428 AER, Review of the rate of return guidelines - Issues Paper, October 2017, p 16.

429 AER, Financial performance measures - Discussion Paper, February 2018.

where there has been contention regarding the assumptions that should be used and the appropriate factors to consider.

However, our draft position is to monitor RAB multiples (as part of our separate review into reporting profitability measures[430]). This may assist us in gauging the overall impact of all our decisions (including expenditure allowances) on investment in network businesses.

In the subsections below, we outline our consideration and responses to the issues that have been raised by stakeholders in submissions (including the CRG) and by experts in the Concurrent Expert Evidence Session.

Stakeholders' submissions in response to our Issues Paper

In response to our Issues Paper:

- Consumer groups submitted that we should consider RAB multiples to inform our decision making – specifically:
    - CCP16 submitted that RAB multiples provide directly observable evidence on whether the outcomes for the allowed rate of return match the expectations of investors and the requirements of the NEO and NGO in practice – it also submitted that RAB multiples can be used to inform the Rate of Return but not mechanistically[431]; and
    - the Major Energy Users submitted that it supported the AER in examining asset sales measures given that it claimed that little information is currently available on the service providers[432].
- However, in contrast some of the network businesses, such as APA, ENA and Spark Infrastructure were against the use of RAB multiples and submitted they were irrelevant given various considerations such as, the price that investors pay for an asset can be impacted by a wide range of different factors, and that the AER should uphold its benchmark approach[433]. Although, we note that Ergon Energy and Energex submitted that information on asset sales is potentially useful in testing the reasonableness of the AER's determinations.[434]

Potential use of RAB multiples to inform the Rate of Return

As indicated above, in its submission, CCP16 supported the use of RAB multiples to inform the rate of return. This was because it considered that they provide the most

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430 AER, Draft Position Paper - Profitability measures for regulated gas and electricity network businesses, April 2018.

431 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, p 6.

432 Major Energy Users, Review of the rate of return guidelines, December 2017, p 14.

433 APA, APA submission responding to AER Issues Paper, December 2017, p 3; Energy Networks Australia, AER Rate of Return Guidelines – Response to Issues Paper, December 2017, p13; Network Shareholder Group, Response to Issues Paper on the review of the Rate of Return Guidelines, December 2017, p 13.

434 Ergon Energy and Energex, Issues Paper – Review of the Rate of Return Guidelines, December 2017, p 3.

direct information available on the relativity of allowed and expected returns on capital or equity, and are easily observed at the time of transactions[435]. CCP16 also provided detailed information on the potential use of RAB multiples including their use by other regulators.

CCP16 noted that with the three most recent electricity network transactions (TransGrid network 2015, Ausgrid network 2016, Endeavour network 2017), the winning bidders paid RAB multiples of 1.6, 1.4 and 1.58 respectively. It considered that a very conservative interpretation of the recent transactions is that they provide strong evidence that the combined allowances for the cost of capital and tax under the AER's current framework and recent decisions are not too low. It suggested that, given the magnitude of the multiples in absolute terms and relative to multiples in other regulatory jurisdictions, one could conclude that it provides evidence that the allowances are more likely to have exceeded investors' expectations for the required return on investment[436].

However, it noted that the weakness of RAB multiples is that further analysis is required to make the best use of the information on the relativity of expected and actual returns. As such, it considered that RAB multiples cannot be used in a mechanical manner. It noted that in the case of TransGrid, the purchasing consortium indicated that TransGrid's two unregulated business units – a telecoms arm and connection of renewable energy to the grid – can provide growth opportunities to warrant the high price. CCP16 also noted that it is likely that the bidder who makes the most optimistic assessment of these opportunities will be the likely winner and this will be reflected in its bid, adding to the premium above TransGrid's RAB[437].

As mentioned previously, CCP16 also provided information on how RAB multiples have been used by other regulators and advisors, as a cross-check on the overall rate of return[438]:

- New Zealand Commerce Commission (NZCC) – States that its focus is not on isolating the individual sources of excess returns, but rather its objective is to assess whether the existing WACC uplift is too generous. It considered that irrespective of the cause of a high RAB multiple, the existence of such multiples is strong evidence that the WACC is not too low.
- The Chairman of the UK Office of Water (Ofwat) has referred to high RAB multiples for UK water utilities as evidence that the regulator's allowed WACC is too high, and noted that the continuing trend for water companies is for them to be sold at

[435] Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, p 29.

[436] Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, p 18.

[437] Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, p 18.

[438] Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, pp118-119.

prices around 130 per cent of regulated asset value. This suggests that the regulator's adopted cost of capital is too high and the premia reflects excess demand for these assets.

- PwC, in its 2013 advice to Ofwat on the approach to reviewing the appropriate returns for water companies, reported an average market-to-asset ratio (MAR, analogous to RAB multiples) in the UK water sector of 1.23. It identified the WACC being set too high relative to the actual costs of financing as a possible driver, in addition to outperformance in the unregulated business (which is generally small), synergies available to a new entity and outperformance in operational allowances.
- Grant Samuel, in 2014 prepared an independent expert's report relating to APA Group's proposal to acquire Australian gas distribution company Envestra. In his report, Grant Samuel commented that a common rule of thumb parameter used in the valuation of energy infrastructure assets are RAB multiples, and noted that most assets generally trade at a premium to RAB and that the precise reasons for this are uncertain but contributing factors could include, amongst others, a cost of capital being less than that assumed by the regulators.
- Deloitte, published in 2011, a paper exploring a number of valuation issues concerning regulated infrastructure assets. When describing factors for Australian utilities trading at a premium, Deloitte stated that the effective cost of capital borne by the asset owner may be lower than that assumed by the regulator due to either a cheaper cost of capital and/or greater leverage.

In response to CCP16's submission, we consider that RAB multiples do provide valuable information and can potentially provide information on the relativity between our determined cost of capital and investors' required cost of capital. This is because when valuing the network businesses, investors would incorporate their ability to outperform on any, or all, of the regulatory benchmarks, including the rate of return building block allowance.

However, as noted by CCP16, the difficulty is in disaggregating the RAB multiples into their different sources of value. The numerous assumptions that must be made regarding the different sources of value, and then the extent of outperformance, and value creation in those items adds considerable complexity and contention to the process of determining the rate of return.

In our consideration of the potential use of RAB multiples, we have also investigated other regulator's use of RAB multiples, as identified by CCP16 in its submission, to consider whether we could also apply a similar approach.

As discussed above, the NZCC has used RAB multiples as one of its considerations to reduce its WACC uplift from the 75th percentile of its WACC range to the 67th percentile[439]. It analysed the RAB multiples for 4 of its regulated electricity and gas

[439] Other considerations included empirical analysis of the expected losses to consumers from under- and over-estimating the 'true' cost of capital.

distribution businesses by making various adjustments to understand why the businesses were acquired (or trading) at a premium to their RAB values. Thus, the NZCC accounted for unregulated revenues, certain financial obligations such as deferred taxes and capital works in progress which were not reflected in the RAB at the time etc [440]. However, we note the limitations the NZCC identified in its use of RAB multiples[441]:

- limited data points – NZCC used 3 acquisition multiples and 1 trading multiple for its analysis
- the possibility of there being a range of factors that could affect the RAB multiples, including outperformance of operating and capital expenditure – the NZCC did not incorporate outperformance of regulatory expenditure allowances in its analysis, and
- difficultly in separating the unregulated activities when decomposing the RAB multiples – whilst the NZCC did incorporate a separation of unregulated business in its analysis, the extent of growth and cost efficiencies that can be achieved in the unregulated portion can be uncertain and hence quite subjective.

We also considered PwC's advice to Ofwat in 2013 as mentioned by CCP16. However, as outlined in our Discussion Paper, we also note PwC's subsequent advice in 2017 to Ofwat in decomposing MARs for two UK water companies (United Utilities and Severn Trent) [442]. PwC's advice was to inform Ofwat's methodology paper for the upcoming 2019 water price reviews. PwC concluded that its analysis of MARs for these two water companies suggested that the allowed return on equity was higher than investors' expected cost of equity.

However, we note that following PwC's analysis, National Grid in the UK commissioned NERA to consider the evidence on MARs for National Grid and UK water companies, including the analysis undertaken by PwC on United Utilities and Severn Trent[443]. NERA considered that PwC had not accurately adjusted for non-regulated businesses, non-wholesale businesses, outperformance opportunities and pension deficits/surpluses. NERA found that the MARs for the businesses, after adjusting for the identified issues, can be approximately 1. Therefore, NERA considered that there was no evidence to suggest that investors' expected cost of equity is lower than the allowed returns for the water sector. NERA also made a similar conclusion in its decomposition of National Grid's MAR.[444]

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[440] NZCC, Amendment to the WACC percentile for price-quality regulation for electricity lines services and gas pipeline services – Reasons paper, October 2014, pp 155-156.

[441] NZCC, Amendment to the WACC percentile for price-quality regulation for electricity lines services and gas pipeline services – Reasons paper, October 2014, p 113.

[442] Delivering Water 2020: Our methodology for the 2019 price review, Appendix 12: Aligning risk and return – December 2017, pp 51-52.

[443] NERA, Implications of Observed Market-to-Asset Ratios for Cost of Equity at RIIO-T2, December 2017.

[444] We note that earlier in July 2017, CEPA analysed the RAB multiple for the sale of National Grid's 61% equity stake in its gas distribution business. CEPA calculated a potential range for the implied cost of equity, which suggested that investors may be willing and able to finance gas distribution assets at an actual cost of equity below the

In our investigation of the potential use of RAB multiples, we also considered the literature available on the different assumptions that can be applied to the different sources of value. We found that they can be wide-ranging, eg:

- Control premiums – Buyers typically pay a premium for a controlling interest in a business but this can vary considerably eg, between 20 per cent to 40 per cent[445].
- Unregulated revenues – Different businesses have differing amounts of unregulated revenue and differing scope for potential growth. We note that for recent transactions the amount and growth in unregulated revenues at the time of the acquisitions were quite varied[446]:
    - TransGrid (RAB value of about $6.2bn to $6.5 billion in 2015): unregulated revenue was about $44 million in 2015,[447] and had increased by about 170 per cent over the preceding 5 years[448].
    - Ausgrid (RAB value of about $15.3bn to $15.8 billion in 2016): unregulated revenue was up to $200 million in 2016 but had not experienced such growth over the preceding years compared with TransGrid[449].
    - Endeavour Energy (RAB value of around $6.2bn to $6.4 billion in 2017): unregulated revenue was up to $125 million, and similarly, had not experienced such growth over the preceding years compared with TransGrid[450].
    - Further, bidders may have differing levels of optimism in the opportunities and cost efficiencies that can be achieved, as noted by CCP16 regarding the potential growth in TransGrid's unregulated revenues.

Concurrent expert evidence session

We also considered experts' views from the Concurrent Expert Evidence Session. In summary, most experts agreed that it is not practicable for observations of RAB multiples to be decomposed in order to draw inferences as to the rate of return

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regulatory allowance. CEPA, Key questions for RIIO-T2 and GD2 - Lessons from the sale of National Grid Gas Distribution, July 2017.

445 As noted by Frontier Economics (Frontier Economics, Why do regulated assets sell for more than the RAB? - IPART 25th Anniversary Conference, October 2017). Grant Samuel & Associates, Takeover Offer from BaoSteel and Aurizon – Independent Expert Report for Aquila Resources Limited, 20 June 2014, p 65; Lonergan Edwards & Associates, Takeover Offer for Country Road Limited – Independent Expert Report, 21 July 2014, p 45; EY, Independent Expert's Report and Financial Services Guide – PanAust Limited Takeover Offer from Guangdong Risking H.K. (holding) Limited 24 April 2015, p 65.

446 The TransGrid, Ausgrid and Endeavour Energy transactions were undertaken in November 2015, October 2016 and May 2017, respectively.

447 This was about 5% of its total income of about $887 million in 2015. TransGrid, Annual Report 2015, p 22.

448 TransGrid, Annual Report 2015, p 7.

449 Ausgrid, Annual Reports 2011 to 2016. Its total income for 2016 was about $2.6 billion.

450 Endeavour Energy, Annual Reports 2012 to 2016. Its total income for 2016 was about $1.5 billion.

required by the market[451]. Hence, it is difficult for them to be used by the AER in the process of setting the rate of return.

Most experts also agreed that there can be several reasons as to why RAB multiples can be higher than 1, and that it is difficult to disaggregate the multiples into their different sources of value. However, two experts disagreed, with one expert expressing their view that high RAB multiples can still indicate that returns are too high[452].

We discuss below our consideration of the issues raised in the session.

Consideration of economic conditions at the time of the transactions

Some experts noted the current structural decline in interest rates, and that they are lower than when the regulatory determinations were made for the recent transactions. Therefore, a potential source of value is a lower cost of debt, which NSW tax payers have benefited from, through a higher sale price. It was also suggested that once interest rates started increasing, there could be the opposite effect ie, where there is no regulatory outperformance of items other than the cost of debt, the RAB multiple could decrease to less than 1.[453]

In response, we agree that it is likely that RAB multiples incorporate economic circumstances at the time of the transactions (they would also incorporate investors' views of future economic conditions). Therefore, depending on when the transaction occurred, the magnitude and the cause of the difference between the investor's required cost of capital and the regulatory rate of return may differ, which further adds to the subjectivity in the assumptions that can be used.

Likelihood of outperformance of the Rate of Return as a source of value

In terms of outperformance of the actual Rate of Return itself, one expert indicated that valuations for the transactions would have been done for over a 99-year period (given the duration of the leases). Therefore, it would be difficult for buyers to definitively know the value of any rate of return outperformance beyond the existing regulatory period for each transaction[454].

However, we note that this argument could also apply to each of the building block items eg, it would be difficult for buyers to definitively know the value of any expenditure outperformance beyond the existing regulatory period. This suggests that RAB multiple premia are largely derived from sources outside of the building block components and due to factors such as control premia and unregulated revenue etc, which we consider to be unlikely.

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451 CEPA, Rate of Return Guideline Review – Expert Joint Report, April 2018, pp 35-36.

452 CEPA, Rate of Return Guideline Review – Expert Joint Report, April 2018, pp 35-36.

453 AER, Concurrent Expert Evidence Session 1 – Proofed Transcript, March 2018, pp 111-113.

454 AER, Concurrent Expert Evidence Session 1 – Proofed Transcript, March 2018, p 113.

We consider that outperformance of the rate of return can potentially be a source of value, as RAB multiples would incorporate the buyer's view of potential outperformance on any, or all, of the regulatory benchmarks.

Limited dataset to develop robust conclusions

One of the experts noted that transactions are relatively infrequent, and there is a risk of inappropriately applying learnings from one transaction generally across all the network businesses eg, if a buyer paid a relatively large premium because it considered it could extract value through improved efficiencies then it would be inappropriate to apply this across the board to other networks as though the rate of return was too generous[455].

We note that there are few acquisition multiples, particularly under the 2013 Rate of Return Guidelines, to draw definitive conclusions. Therefore, we agree with the view expressed at the Concurrent Expert Evidence Session, and so we would be cautious about applying findings from an investigation of any sample set with few observations, into a guideline that would apply to all the service providers.

Also, for analysis of RAB multiples, we consider that acquisition multiples would be preferable over trading multiples. This is because trading multiples would conceivably incorporate more factors that would need to be adjusted for eg, trading multiples are likely to include shareholders' views of managements' ability to deliver outperformance, whereas with acquisition multiples, the purchaser would be assessing their own ability to deliver outperformance – hence trading multiples are likely to have added information asymmetry.

High RAB multiples can still indicate that returns are too high

One of the experts disagreed with the view that it is not practicable for observations of RAB multiples to be used to inform the Rate of Return. His view was that high RAB multiples can still indicate that returns are too high[456].

We consider that RAB multiples incorporate a multitude of information, including the possibility that the allowed Rate of Return is higher than the expected return required by investors. However, the outperformance may be in part (or wholly) due to outperformance in other building block items or sources of value outside of regulated revenues. As mentioned previously, the difficulty is in disaggregating the RAB multiples to determine the degree of outperformance of the allowed rate of return. Hence, we are cautious about drawing conclusions purely based on the observation that RAB multiples are high.

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[455] AER, Concurrent Expert Evidence Session 1 – Proofed Transcript, March 2018, p 115.

[456] CEPA, Rate of Return Guideline Review – Expert Joint Report, April 2018, pp 35-36.

Submissions in response to the Concurrent Expert Evidence Session

We have also considered submissions in response to our Discussion Paper and the Concurrent Expert Evidence Sessions:

- Network businesses reiterated their general view that RAB multiples should not be used to inform the rate of return[457]
- The Consumer Reference Group (CRG) commented that the network businesses are continuing to enjoy strong earnings and are trading at multiples of 1.3 to 1.6 of their RABs[458].
- CCP16 reiterated its view that RAB multiples provide information on expected returns that is directly relevant to the AER's task of determining a fair rate of return. It again noted that while other factors affect RAB multiples, it considers that there are sound regulatory and commercial precedents for disaggregating the impacts of these factors, and that the implied ROE can be used in a directional manner in setting the ROE and ROR – not in a mechanical manner. CCP16 also noted that at the Concurrent Expert Evidence Session there was agreement that RAB multiples contain information on expected returns, but disagreement on if and how RAB multiples can be used in determining the Rate of Return[459].

CCP16 also referred to its previous submission regarding analysis by Credit Suisse of the TransGrid transaction which suggested that even after allowing for the outperformance on the efficiency incentives, zero tax payments for the foreseeable future, and growth in unregulated business there is an additional $1bn (or around 15 per cent of RAB) in unaccounted value. CCP16 considered that the most likely remaining explanation for this is that the allowed Rate of Return exceeds the required Rate of Return[460].

In response, we note that for the TransGrid transaction, it could be that the allowed rate of return is indeed higher than the rate of return required by investors. However, we also note that it could be in part (or wholly) due to other reasons such as:

- Differences in views of the potential growth and cost efficiencies achievable in the unregulated portion of TransGrid's revenues.

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[457] Evoenergy, Rate of return guideline – evidence sessions, May 2018, p 5; Network Shareholder Group, Submission on the Rate of Return Guideline review, May 2018, p 10; APA, APA submission responding to discussion papers and expert evidence, May 2018, p 3; ENA, AER Review of the Rate of Return Guideline – Response to Discussion Paper and Concurrent Expert Evidence Sessions, May 2018, pp 12-13; APGA, Submission to the AER – Review of rate of return guideline, May 2018, p 21.

[458] RoR CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p vi.

[459] Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, May 2018, pp 8, 54, 58 – 64.

[460] Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, May 2018, p 64.

- Possibility that the buyers overpaid for their acquisition due to optimism in assumptions[461], or unobserved assumptions (that may be considered optimistic or unrealistic) but have actually been incorporated into the purchase price[462]

CCP16 also noted that it broadly supports Professor Johnstone's position, that while the implied return in RAB multiples cannot be estimated with precision, it is reasonable to draw qualitative conclusions from very high values[463]. However, as mentioned above, we are cautious about drawing conclusions, purely based on the observation that RAB multiples are high.

AER assessment of the use of RAB multiples

After considering all the submissions and experts' views, in order to use RAB multiples to inform our rate of return, we consider that we would need to be able to control for at least the following items (including any interactions between the factors):

- Outperformance in regulatory benchmarks, including expenditure allowances (operating expenditure and capital expenditure) and tax allowances
- Unregulated revenue – potential growth and cost efficiencies that can be achieved
- Control premium – if the acquisition results in a majority share ownership; also value may be placed on perceived real options which may be easier to exercise with a majority share ownership
- Economic circumstances at the time of the transactions – differences between the rate of return set at the time of the business' determination versus market conditions when the transactions took place
- Possibility of over-optimism in assumptions.

However, there is much subjectivity and no agreement from experts on the appropriate assumptions to use to disaggregate these multiples. We also note recent developments in the UK, with the decomposition of RAB multiples for particular utilities, where there has been contention regarding the assumptions that should be used and the appropriate factors to consider.

Therefore, given the subjectivity and uncertainty in assumptions required to disaggregate RAB multiples, our draft decision is that the use of these multiples is not an appropriate method to inform our decision on the rate of return.

Rather, our draft position is to examine:

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461 Optimism in the efficiencies that can be achieved in the expenditure allowances.

462 Wright, Burns, Mason & Pickford, Estimating the cost of capital for implementation of price controls by UK Regulators – March 2018, p 13.

463 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, May 2018, p 60.

- the latest empirical evidence for each of the parameters in the Sharpe-Linter CAPM, that we are using as our foundation model
- the level of conservatism that we applied in selecting our parameter estimates when developing the 2013 Rate of Return Guideline and the continuing appropriateness of this, and
- the decisions we have made in subsequent determinations following the 2013 Guidelines

to determine the parameter estimates that best achieve the NEO, NGO and related RPPs, to promote the efficient delivery of services by the network businesses for the long-term interests of consumers.

Our draft decision is consistent with the approach we adopted in the 2013 Guidelines.

3.3.2 Historical profitability

Analysis of historical profitability refers to the use of financial statements to compare:

- free cash flows to equity, with the
- estimated cash flows to equity (inputted into the rate of return building block).

In our 2013 Guidelines, we did not include the use of historical profitability measures to inform our rate of return estimate. Service providers are incentivised to outperform regulatory benchmarks for opex, capex, debt, tax and service performance. Thus, the ability for a service provider to earn an actual return on equity higher than the allowed return on equity, may be due to the outperformance of these benchmarks - importantly outperformance does not necessarily imply that the regulatory rate of return is incorrect.[464] Further, historical profitability measures provide information on historical profitability, which may not reflect investor expectations about future profitability.

However, during recent determination processes, consumer groups have made submissions raising concerns around excessive profitability of network businesses, and hence the need for ongoing profitability reporting and assessment[465]. In response to those submissions, we commenced a separate consultation process exploring the use of profitability measures for these businesses - AER review into profitability measures for regulated gas and electricity network businesses.[466] We have also received submissions on this topic as part of our rate of return guideline review.

In our draft Position Paper for our profitability measures review, we identified the following measures to potentially report on: Return on Assets, Return on Equity, EBIT/customer numbers and RAB multiples.[467]

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[464] AER, Rate of Return Guideline - Explanatory Statement, December 2013, p 48.

[465] AER, Discussion Paper - Financial performance measures, February 2018, p 11.

[466] AER, Draft Position Paper – Profitability measures for regulated gas and electricity network business, April 2018.

[467] AER, Draft Position Paper – Profitability measures for regulated gas and electricity network business, April 2018.

Our draft decision is not to use the historical profitability measures identified in our draft Position Paper to inform our rate of return for this guideline review. This is because we currently do not have a robust data set to calculate these measures. This approach is consistent with our 2013 Guidelines.

However, going forward, for the purposes of determining the rate of return, we consider that careful consideration of profitability measures (such as those identified from financial statements) may be helpful in identifying whether the business' actual cost of debt has been systematically lower or higher than the cost of debt applied in the rate of return.

The subsections below set out further detail on our review into reporting profitability measures, submissions received, and our assessment of the role of historical profitability measures for our 2018 rate of return guideline.

Separate AER review into reporting of profitability measures

In November 2017, we released a discussion paper on profitability measures for regulated electricity and gas network businesses[468]. The paper also included a study undertaken by McGrath Nicol on the measures of financial performance that could be applied to the businesses we regulate.

In April 2018, we released a Draft Position Paper identifying the suite of profitability measures that we intend to report on: Return on Assets, Return on Equity, EBIT/customer numbers and RAB multiples.[469]

In our Draft Position Paper, we noted that in response to our discussion paper, there was general support for our intent to collect and report data on measures of profitability. Consumer groups stated profitability analysis formed an essential post-implementation review of the regulatory framework, providing an important check on how service providers performed against the regulatory determination. They considered the measures would assist consumers to identify if the networks were achieving excessive profits relative to the risks they faced and investigate the causes of any excessive profits.[470]

We stated that our primary purpose in reporting the measures is to provide transparency for stakeholders on the profitability of the service providers, and that we intend to publish the measures (including our analysis of the outcomes and any relevant caveats) in annual performance reports for gas and electricity businesses.

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[468] AER, Discussion Paper – Profitability measures for regulated gas and electricity network business, November 2017.

[469] AER, Draft Position Paper – Profitability measures for regulated gas and electricity network business, April 2018.

[470] AER, Draft Position Paper – Profitability measures for regulated gas and electricity network business, April 2018, p 2.

We consider this additional information will assist stakeholders in making submissions to our regulatory determination processes and other regulatory reviews.[471]

We also stated that we would have regard to profitability outcomes of the service providers as part of our regulatory determination processes. However, the information would not be used in a mechanistic way to make adjustments to allowed revenues. Rather, the information would be contextual, along with other information such as expenditure and service performance outcomes from previous regulatory periods.

We held a public forum on the draft position paper on 16 May 2018, and submissions were due by 30 May 2018. We intend to release our final position in August 2018.

In the sections below, we outline the submissions we have received in relation to profitability measures, as part of this Rate of Return guideline review. We also discuss our consideration of the issues raised (including views expressed by experts) in reaching our draft decision on the rate of return.

From the submissions received, we found that stakeholders were generally in support of our work in investigating profitability measures. However, there were mixed views on how useful profitability measures are in informing our decision on the rate of return.

Stakeholders' submissions in response to our Issues Paper

In response to our Issues Paper, service providers submitted that:[472]

- Profitability measures are potentially useful in testing the reasonableness of the AER's overall revenue determination. However, it is difficult to use this information directly to inform the rate of return.
- Examination of a firm's profitability provides a useful cross-reference regarding the relationship between regulatory returns and the broader performance of the business. However, the principles set out in the rate of return guideline must maintain primacy in determining how the actual return is derived.
- APA and Spark Infrastructure submitted that information on profitability is irrelevant to assessing the allowed rate of return[473].

The Agricultural Industries Energy Task Force submitted that it supported the AER using a performance measurement framework and having access to detailed financial data from companies. The task force referred to work completed by the Sapere Group

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471 AER, Draft Position Paper – Profitability measures for regulated gas and electricity network business, April 2018, p 5.

472 Ergon Energy and Energex, Issues Paper – Review of the Rate of Return Guidelines, December 2017, p 3; Origin Energy, Review of rate of return guidelines, December 2017, p 2.

473 APA, APA submission responding to AER Issues Paper, December 2017, p 3; Network Shareholder Group, Response to Issues Paper on the review of the Rate of Return Guidelines, December 2017, p 13.

which claimed that under the current guideline, network owners can exceed efficient costs, prices and profits.[474]

Consumer groups such as the MEU, ECA and EUAA supported the use of profitability measures[475]. The EUAA submitted that it is a weak argument to state that 'there are many reasons for actual profitability to be above the Allowed Rate of Return Objective so we should not be worried about actual profitability'[476].

CCP16 submitted that historical profitability measures can be used to assess whether actual profitability has been lower or higher than:[477]

- the allowed Rate of Return under the determination, and
- other comparable regulated and unregulated businesses.

CCP16 also indicated that we would need to identify the underlying reasons for variations in actual profitability against the allowed rate of return, and compare profitability using multiple measures. It also stated that for example, if EBIT/RAB is comparable to the allowed rate of return, but the return on equity is significantly above the rate inputted into the rate of return, it may suggest that:[478]

- the tax allowed is higher than the actual tax paid
- the actual gearing levels are significantly different from the assumed level and/or
- actual debt costs are significantly below the benchmark debt costs assumed.

It noted that lower debt costs could be because:

- the utilities have better credit ratings than assumed, or
- lenders perceive that regulated utilities have lower business risks that are not fully reflected in the ratings and are willing to lend at lower rates than the benchmark for comparable businesses.

Concurrent Expert Evidence Session

Whilst not explicitly discussed at the Concurrent Expert Evidence Session, it was however addressed in the Joint Expert Report. In the report, most experts agreed that ex post firm-specific profitability data contains no information that assists in estimating the rate of return required by the market[479].

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474 Agricultural Industries Energy Taskforce, Submission on rate of return issues paper, December 2017, p 3.

475 Major Energy Users, Review of the rate of return guidelines, December 2017, p 14; Energy Consumers Australia, Review of the rate of return guideline, December 2017, p 13;

476 Energy Users Association of Australia, EUAA submission - AER Rate of Return Review Issues Paper, October 2017, p 4.

477 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, pp 26-27.

478 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, pp 27-28.

479 CEPA, Rate of Return Guideline Review – Expert Joint Report, April 2018, p 35.

However, one expert expressed the view that profitability measures could be used to assess whether company or industry returns were too high, and that ex post reviews (actual financial performance outcomes) provides an indication of whether the idealised building block approach has done something "reasonable" and sustainable[480]. If not, then the building block approach can be replaced with something possibly simpler and more transparent (eg, CPI increases only) or the input parameters could be changed, to achieve a realistic level of "good" regulation.

Submissions in response to the Concurrent Expert Evidence Session

In response to the Concurrent Expert Evidence Session and our Discussion Paper service providers submitted that analysis of historical performance measures should not be used in determining the rate of return.[481]

However, consumer groups continued to support the use of profitability measures. Both the Consumer Reference Group (CRG) and the Queensland Council of Social Services (QCOSS) considered that the profitability of the Queensland networks were excessive. QCOSS submitted that the returns for Powerlink, Energex and Ergon were substantially higher than other energy supply industry participants (eg, CS Energy and DUET Group).[482] The CRG submitted that we should use actual profitability data to compare against modelled returns, but noted that there is currently no reporting being undertaken under the 2013 Rate of Return Guideline.[483]

CCP16 reiterated its view submitted in response to the Issues Paper, and stated that general financial performance measures can inform the overall judgement on the Rate of Return, which will in turn be reflected in the values for the underlying parameters such as the MRP and beta, around which there is considerable uncertainty.[484]

However, CCP16 submitted that as they are backward looking measures they provide limited guidance on expected returns, but comparisons of historical profitability measures can provide information on the performance of the regulatory system as a whole. CCP16 considered that this information cannot be used at a parameter level,

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480 CEPA, Rate of Return Guideline Review – Expert Joint Report, April 2018, pp 35-36.

481 Network Shareholder Group, Submission on the Rate of Return Guideline review, May 2018, p 10; APA submission responding to discussion papers and expert evidence, May 2018, p 3; ENA, AER Review of the Rate of Return Guideline – Response to Discussion Paper and Concurrent Expert Evidence Sessions, May 2018, pp 12-13;

482 Both submissions referred to a report undertaken by ResponseAbility which showed that the average annual profit margins over the past 5 years for Queensland networks had been between 25% to 30%, whereas for CS Energy it had been a little over 10% and for DUET Group less than 10% over the same period. QCOSS, Submissions on review of Rate of Return Guideline, May 2018, pp 16-17; RoR CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p 20.

483 RoR CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p 20.

484 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, May 2018, pp 8, 54.

but can inform the overall exercise of judgement in setting the rate of return, or reviewing other elements of the regulatory regime[485].

AER assessment of the role of historical profitability measures

Our draft decision is not to use the historical profitability measures identified in our draft Position Paper to inform our rate of return for this guideline review. This is because we currently do not have a robust data set to calculate the measures identified in our draft Position Paper. This approach is consistent with the 2013 Guidelines.

As indicated in our draft Position Paper for the profitability measures review, our intention is to collect the information required, and commence calculating and presenting the profitability measures identified. We consider that it is important to collect information on the actual profitability of the network businesses that we regulate. This can help inform us on the effectiveness of our regulatory framework and identify areas that require further investigation. For example, if investigation of actual profitability against the allowed rate of return identifies that the main driver of the higher profits is due to systematically lower than expected expenditures, then we may need to further investigate our approach to setting the expenditure allowances.

However, we do consider that there are limitations in the use of historical profitability measures to inform our rate of return. We do not consider that such measures could directly inform us as to whether the allowed return on equity was too high or too low. This is because, if a particular business' revenue and actual costs (eg, operating and capital expenditure, tax and debt costs including gearing) were to equal its regulatory allowances (or assumptions), then theoretically the business should only be able to earn its allowed return on equity (excluding any unregulated cashflows).[486]

Therefore, variations between actual profit and return on equity could be indicative of variations between actual and expected: revenues; expenditure allowances; interest costs; gearing; depreciation and tax allowances. Under incentive based regulation, if businesses are able to lower their actual costs whilst meeting their required service standards (ie, are able to achieve efficiencies) then they are able to keep part of the benefits, which would manifest in their actual return on equity, being higher than their allowed return on equity.

However, we consider that careful consideration of profitability measures (such as those identified from financial statements) may be helpful in identifying whether the business' actual cost of debt has been systematically lower or higher than the cost of debt applied in the rate of return.[487] In this regard, while we agree with the majority view expressed at the Concurrent Expert Evidence Session that ex post profitability

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[485] Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, pp 27-28.

[486] For simplicity, we have set aside the differences between nominal and real returns in our regulatory framework.

[487] This is because through careful consideration of financial statements we may potentially be able to compare the actual interest costs paid by businesses against the allowed return on debt.

data should not directly inform our rate of return estimate, we disagree that historical profitability measures contain no useful information.

In response to CCP16 comments about using financial performance measures to exercise judgement on the overall rate of return, or even at the parameter level, we consider it appropriate to first understand the drivers behind any financial performance measures before exercising any form of judgement.

We would also like to note that we regularly review our approach to setting all our regulatory allowances, to examine whether they remain appropriate. We have commenced a review of our tax allowance, given preliminary advice from the ATO indicated an apparent material discrepancy between our tax allowances and the actual tax payments made to the ATO by the service providers. If the actual tax paid by the businesses is lower than our regulatory tax allowance, then this can be a driver of actual returns being higher than our expected returns. We are currently seeking submissions to our tax review, and we are intending to release our final report and recommendations by December 2018.[488]

3.3.3 Financeability assessments

Financeability refers to a service provider's ability to meet its financing requirements and to efficiently raise new capital. In the regulatory context, it often refers to the service provider's ability to achieve the benchmark credit rating applied in the estimation of the rate of return. This is typically assessed through examining the key financial ratios used by credit rating agencies and testing if these ratios support the benchmark credit rating, based on a service provider's allowed cashflows. As it involves testing the benchmark credit rating against allowed cashflows, various stakeholders have argued that it may be viewed as a cross-check on the assumptions underpinning those allowed cashflows.

Our 2013 Rate of Return Guideline does not include a financeability assessment as part of determining the rate of return, nor does it include it as a cross-check on the reasonableness of the rate of return.[489] In subsequent consultations some stakeholders submitted that financeability should be used as a potential test of whether the allowed rate of return is achieving the legislative objectives.[490]

Our draft decision is not to use financeability assessments to inform our rate of return. We consider that a financeability assessment would not be helpful in a regulatory context if it were to be undertaken using the assumptions (eg, gearing and interest costs) underpinning the allowed revenue. We also do not consider it appropriate to undertake a financeability assessment using the actual costs of a service provider as these costs may not be efficient.

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[488] AER, Issues Paper – Review of regulatory tax approach, May 2018; AER, Tax Review 2018 - Initial Report, June 2018.

[489] AER, Rate of Return Guideline - Explanatory Statement, December 2013, p 59.

[490] AER, Issues Paper - Review of the rate of return guidelines, October 2017, p 16.

Therefore, there is no clear guidance on the assumptions that should be used in any financeability assessment as a cross check on the benchmark parameters in the Sharpe-Linter CAPM that we are using as our foundation model. Consideration of the appropriateness of these parameters should continue to be based on the evidence examined in determining those parameters.

Stakeholders' submissions in response to our Issues Paper

In response to our Issues Paper, service providers were generally in favour of financeability assessments as a cross-check on the reasonableness of the AER's decisions, and to ensure consistency with the AER's benchmark credit rating assumption.[491] However, some businesses indicated that it is difficult to use financeability assessments to directly inform the rate of return, and that the debt and equity principles applied in the rate of return must retain primacy.[492]

The ENA submitted that if an issue is identified then it would not necessarily mean that an adjustment in the rate of return is required – rather, it could be addressed through re-profiling of regulated cash flows from future periods.[493]

CCP16 considered that financeability assessments could serve as a cross-check of the regulator's decision but not as a driver of decisions. It also submitted that the primary responsibility for addressing financing issues should rest with the business (including through equity injections). It also commented that in applying tests, regulators commonly assume benchmark gearing and capex and opex in line with the regulator's assumptions so that it does not provide for poor management. It also indicated that other regulators (eg, Ofwat and Ofgem) have adopted the approach of testing the impact of a range of scenarios on the likely outcome for the return on equity. It considered that this was another potentially useful means of testing the sustainability of a regulatory decision.[494]

Concurrent Expert Evidence Session

In summary, most experts at the session agreed that financeability analysis may provide insights on the time profile of cash flows. However, such analysis would not provide objective information for use in setting the rate of return required by the market.[495]

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491 APA, APA submission responding to AER issues paper, December 2017, p 3; ATCO Gas Australia, Review of rate of return guideline – Issues Paper, December 2017, p 4;

492 Network Shareholder Group, Response to issues paper on the review of the Rate of Return Guidelines, December 2017, p 4; Origin Energy, Review of rate of return guidelines, December 2017, p 2; Ergon Energy and Energex, Issues Paper – Review of the Rate of Return Guidelines, December 2017, p 3;

493 ENA, AER Rate of Return Guidelines – Response to Issues Paper, December 2017, p 13;

494 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Issues Paper, December 2017, pp 6, 30

495 CEPA, Rate of Return Guideline Review – Expert Joint Report, April 2018, pp 36-37.

We note that one expert suggested that financeability analysis could be used as a test of the internal consistency of the regulatory determination. That is, a certain credit rating is assumed when determining the allowed cashflows, however, if key financial ratios using the allowed cashflows, do not support the credit rating that was initially assumed, then assumptions may need to be revisited.[496]

Some experts considered that if analysis of cash flow profiles were to be undertaken (for a business and its capex program – especially if it is particularly large) and there is a breach of credit metrics leading to a downgrade, then this would indicate an issue of the timing of cash flows. The expert joint report suggested that to remedy the situation:[497]

- a company's management would be able to raise equity and/or defer dividends
- alternatively, a regulator may have flexibility to adjust depreciation schedules in a NPV neutral way.

The report also noted that the analysis of cash flow profiles should use a gearing assumption based on that of the benchmark efficient entity rather than the actual gearing of the company. Also, the report noted that a range of other stylised assumptions would need to be made (eg, borrowing at the rate assumed in the trailing average debt calculation).[498]

Submissions on our discussion paper and concurrent evidence session

In response to the Concurrent Expert Evidence Session and our Discussion Paper the ENA submitted that financeability assessments should be considered to ensure that the allowed return is sufficient to support the assumed credit rating used to determine the cash flows.[499] APA on the other hand submitted that financial performance measures are irrelevant to the setting of the Rate of Return.[500]

CCP16 reiterated its views submitted in response to our Issues Paper – mainly that the AER should not use financeability analysis as a direct input into the consideration of the Rate of Return. It also highlighted that regulators, when undertaking financeability assessments, typically use the ratios used by rating agencies and that these are well accepted, but ratings also depend on the qualitative evaluation of the business environment. It noted that for regulated businesses, the quality of the regulatory framework is critical and that it considered that the AER's current regulatory framework

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496 CEPA, Rate of Return Guideline Review – Expert Joint Report, April 2018, pp 36-37.

497 CEPA, Rate of Return Guideline Review – Expert Joint Report, April 2018, pp 36-37.

498 CEPA, Rate of Return Guideline Review – Expert Joint Report, April 2018, pp 36-37.

499 ENA, AER Review of the Rate of Return Guideline – Response to Discussion Paper and Concurrent Expert Evidence Sessions, May 2018, p 14.

500 APA, APA submission responding to discussion papers and expert evidence, May 2018, p 3.

is more than achieving this objective, as the framework has delivered relative stable ratings at or above investment grade.[501]

CCP16 also noted that at the Concurrent Expert Evidence Session the primary issues addressed by financeability tests are matters of timing (that the building block model, properly applied, provides a revenue stream over the asset's life that matches the costs). It commented that to address any financeability issues, other regulators have:[502]

- placed primary responsibility on the utility for managing cash flows across regulatory periods, and
- required that any financeability adjustment is NPV neutral.

CCP16 also considered that if a financeability issue arose, it is likely to require a utility specific adjustment which is not possible within a framework that:[503]

- requires NPV neutrality within each regulatory period
- a common Rate of Return determined in accordance with a binding instrument.

AER assessment of financeability tests

Our draft decision is not to use financeability assessments to inform our rate of return. This is consistent with the approach we adopted in the 2013 Guidelines. Whilst the rate of return does comprise a large component of the building block revenue, it is not the sole determinant of cashflows. Also, assessing whether cashflows are sufficient to maintain a credit rating involves assessing more than the allowed rate of return. It typically involves:

- a quantitative assessment of a service provider's actual and projected revenue, expenditure and finance costs, and
- a qualitative assessment of a service provider's regulatory environment and ownership model
- to form an opinion on the ability and willingness of a service provider to meet its financial obligations.

Therefore, a service provider may have a higher or lower credit rating than our benchmark depending on the credit rating agency's qualitative assessment of the service provider, and/or whether the service provider is projected to outperform or underperform relative to regulatory allowances, including expenditure allowances.

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501 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, May 2018, pp 64-65.

502 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, May 2018, pp 64-65.

503 Consumer Challenge Panel, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, May 2018, pp 64-65.

Thus, a lower credit rating than our benchmark rating is not necessarily an indication that the rate of return is insufficient (and vice versa).

Further, we do not consider that a financeability assessment would be helpful in a regulatory context if it were to be undertaken using the assumptions (eg, gearing and interest costs) underpinning the allowed revenue. This is because the cashflows assumed under such a financeability assessment, would be equal to the cashflows provided in calculating the allowed revenues in the first place – which means that there would be no cashflow timing issues under such an assessment.[504]

We also do not consider it appropriate to undertake a financeability assessment using the actual costs of a service provider. This is because we are aiming to provide benchmark allowances to allow for efficient service delivery – not actual costs which may be inefficient.

We consider that financeability assessments may be useful to service providers internally when they consider how to best finance their capital expenditure, particularly if there is a relatively large forward capex program. Given its actual costs, the business can undertake financeability assessments to decide how to finance the expenditure (eg, the mix of borrowings, raising equity and/or deferring dividends) and any implications the financing may have on its credit rating.

We also note that empirical evidence over the past 10 years, as presented in our Discussion Paper, suggest that credit ratings for service providers have been stable and have been at around BBB+.[505] Further, there has been no indication from service providers (or stakeholders), or sufficient evidence put forward, that the allowed rate of return has been insufficient and hence is the cause of adversely affecting service providers' financeability.

Also, we note our decision to adjust certain parameters downwards, which would decrease the rate of return, holding all else constant. However, we have made these decisions using the latest empirical evidence available for each of those parameters. Hence, given that these adjustments are in line with market conditions, we do not consider that these incremental changes would adversely affect a service provider's financeability.

Stakeholders identified that financeability assessments are typically undertaken alongside considerations of whether or not to re-profile cashflows and bring forward cashflows from future regulatory periods (for example, through changing depreciation profiles). We note that this requires consideration of the entire profile of cashflows

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[504] We note that we also provide a return of capital (regulatory depreciation) allowance, and that the credit metrics treat depreciation as a non-cash item, which provides some headroom. However, it is necessary for a return of capital to be incorporated into the building block revenues as it is appropriate for funds to be returned to the provider of capital.

[505] AER, Discussion Paper – Financial performance measures, February 2018, p 32.

resulting from a regulatory determination, which is beyond the scope of the rate of return guideline and more appropriately considered at each determination.

3.4 Summary of submissions

This section details the submissions we have received from stakeholders as part of our review process to date, and notes how we have had regard to each submission.

Table 12 Summary of submissions on automatic application

Key point	Submission	Stakeholder	AER response
Rationale for fixing parameters or prescriptive methodology	Supports fixing parameter values to maximise investor certainty where there has been no material change since they were last set and no material changes are expected over the next Instrument period. Materiality must be assessed against the level of precision and judgment required in establishing the initial level.	Network Shareholder Group[506]	The evidence considered in setting each parameter value is discussed in the relevant sub sections throughout this document. In this section we have considered whether we should fix the parameter value for the life of the guideline.
	Supports experts joint report position that parameters that are relatively stable over a long period (regulatory control period or more) or data at a given point in time is not suited for estimating the parameter value should be the ones that are fixed.		We agree
	Re-openers must be limited where parameters are fixed. If Material changes occur, they are better addressed via re-openers.		The legislation does not allow re-openers[507]
	Relatively stable parameters should be fixed. Other parameters should be set with reference to market data at the time of the determination and accordingly the Instrument should set out the methodology for determining the value.	Evoenergy[508]	We agree
	Strongly encourages the AER to make the new binding Instrument as prescriptive as possible with appropriate formula to vary the actual rate of return as necessary rather than re-opening.	CCP 16[509]	The legislation does not allow re-openers. We have adopted an approach to assessing whether we should fix parameters or set a formula to vary the returns consistent with the experts' consensus.

506 NSG, *Submission on the RORG review*, 4 May 2018, p.13.

507 CoAG EC, *Bulletin, Binding rate of return guideline,* June 2018.

508 Evoenergy, *Review of the rate of return Instrument – evidence sessions*, 4 May 2018.

509 CCP 16, *Submission to the AER on its RORG review concurrent evidence session*, 4 May, 2018, pp.16-17.

Fixed parameters	Gearing (60 per cent), equity beta (0.7) and MRP (7.0) should be fixed.	Network Shareholder Group[510]	The value for gearing, equity beta and MRP are discussed in the relevant chapters. Our decision to fix these parameters during the life of the Instrument has been determined consistent with the rationale proposed by the NSG.
	If the Instrument does not set a value for the MRP for the life of the Instrument then it should identify the weights given to each source of information.	Evoenergy[511]	We set a value for the MRP for the life of the Instrument
	Fix the equity beta and MRP to promote stability, predictability and consistency of the allowed rate of return.	Jemena[512]	Equity beta and MRP are fixed
	The AER's decision to give weight to the DGM should be done in the context of a binding Instrument. The generally volatile nature of the DGM outputs is a major issue in setting a MRP for a binding Instrument.	CCP 16[513]	Our decision on the weight given to the DGM is set out in chapter 7. We agree with most experts that it is more appropriate to fix the MRP for the life of the Instrument
Prescriptive methodology	The risk free rate be set as a prescriptive methodology	Network Shareholder Group[514]	We agree

Table 13 Summary of submissions on financial performance measures

Key point	Submission	Stakeholder	AER response
RAB multiples			
Relevance of RAB multiples in determining the RoR	RAB multiples are largely irrelevant (not necessary) in assessing the allowed RoR. Spark Infrastructure also added that it supports the AER's current benchmark approach (which provides businesses with incentives to operate efficiently).	APA[515], Spark Infrastructure[516] APA[517]	We consider that RAB multiples may potentially provide information on the differences between the allowed RoR and investors' required RoR. However, the difficulty is in extracting the information given the subjectivity in assumptions involved in disaggregating the multiples.

510 NSG, *Submission on the RORG review*, 4 May 2018, p.13.
511 Evoenergy, *Review of the rate of return Instrument – evidence sessions*, 4 May 2018.
512 Jemena, *Submission on concurrent evidence sessions and discussion papers*, 4 May 2018.
513 CCP 16, *Submission to the AER on its RORG review concurrent evidence session*, 4 May, 2018, p.116.
514 *Submission on the RORG review from the Network Shareholder Group (NSG*), 4 May 2018, p.13.
515 APA, *APA Submission responding to the AER issues paper*, December 2017, p 3.
516 Network Shareholder Group, *Response to Issues Paper on the review of the Rate of Return Guidelines*, December 2017, p 13.
517 APA, *APA submission responding to discussion papers and expert evidence*, May 2018, pp 3-4.

	No weight should be given to asset sales, as the price investors pay can be impacted by a wide range of different factors – considered that most experts agreed with this view at the CEES. The ENA also added that every transaction is unique, hence it would be wrong to extrapolate from one particular transaction across the entire industry.	ENA[518]	We agree that a range of factors can affect RAB multiples. We also note that each transaction may have unique characteristics eg, businesses may have differing scope for growth in unregulated revenues. Hence, any findings would need to be carefully examined.
		ENA[519], Evoenergy[520], Network Shareholder Group[521]	
	RAB multiples play little role in setting an allowed RoR ex-ante, but can play an important role ex-post in monitoring outcomes.	Australian Pipelines and Gas Association[522]	Our draft position is to monitor RAB multiples (as part of our profitability reporting framework). This may assist us in gauging the overall impact of all our decisions (including expenditure allowances) on investment in network businesses.
	Supports the use of asset sales, as there is little information currently available on the service provider sector.	MEU[523]	As mentioned above, we are mindful of the subjectivity in assumptions required to disaggregate RAB multiples.
	RAB multiples provide direct observable evidence on whether the outcomes for the allowed RoR match the expectations of investors and the requirements of the NEO/NGO in practice. They are also considered by other regulators (eg, NZCC and Ofwat).	CCP[524]	We note that RAB multiples have been either used (or referred to) as one of several considerations. However, we also note the limitations in their use, as identified by other regulators, and recent developments in the UK that highlight the subjectivity in the assumptions involved in disaggregating the multiples.
		CCP[525]	
	Transactions for business with regulated entities have RAB multiples of 1.3 to 1.6. This could be used to adjust the observed beta range from 0.4 – 0.7 to 0.2 – 0.5.	CRG[526]	Our draft decision is not to use RAB multiples to adjust parameters given the subjectivity in assumptions involved, and there being no clear agreement from experts on the assumptions that should be used.
Using RAB multiples as a 'cross-check' on	RAB multiples should not be used in a mechanical manner (or to directly inform the RoR), but rather as a	CCP16[527], Ergon Energy and Energex[528]	Due to the subjectivity in assumptions required to disaggregate the RAB multiples, it is difficult to objectively

518 ENA, *AER Rate of Return Guidelines – Response to Issues Paper*, December 2017, p 13.

519 ENA, *AER Rate of Return Guidelines – Response to Issues Paper*, December 2017, p 13; ENA, *AER Review of the Rate of Return Guideline – Response to Discussion Papers and Concurrent Expert Evidence Sessions*, May 2018, pp 92-93.

520 Evoenergy, *Review of rate of return guideline – evidence sessions*, May 2018, pp 4-5.

521 NSG, *Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG),* May 2018, pp 12-13.

522 APGA, *Submission to the AER – Review of rate of return guideline*, May 2018, p 21.

523 Major Energy Users, *Review of the rate of return guidelines*, December 2017, p 14.

524 CCP16, *Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, p 6.

525 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, pp 54, 57, 61, 62.

526 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p vii.

the RoR	reasonableness check on the RoR decision.	CCP[529]	determine how much of the premium in the multiples are due to investors' required RoR being different from the allowed RoR.
	Considers that there is no role for RAB multiples to be used as a 'cross-check', as it agrees with most experts that there is no objective basis for the application of an overall test of the reasonableness of the RoR decision. Also, using RAB multiples as a 'cross-check' could result in a further avenue for backdoor discretion, which does not promote confidence in the stability of the process; also the 'cross-check' information itself, if used, would then be elevated above all other considerations, circumventing the rigour and transparency that may have preceded it.	Network Shareholder Group[530]	As mentioned above, we consider that it is difficult to objectively determine how much of the premium in RAB multiples is due to outperformance of the allowed RoR. Therefore, we do not consider it is an appropriate method to use in a binding instrument.
Financeability			
Relevance of financeability in determining the RoR	Supports the use of financeability assessments - noted that they are routinely used by other regulators, and that they are an important consideration in order to ensure the financial viability of service providers. ENA also submitted that such an assessment would ensure that the allowed RoR is sufficient to support the assumed credit rating used to determine the cash flows. APA also submitted that financeability could be important given that providers of finance have regard to allowed rates of return.	ATCO Gas Australia[531], ENA[532] ENA[533], APA[534]	We consider that financeability assessments would not assist in determining the RoR: the RoR allowance is not the sole determinant of cashflows; credit ratings typically include more than just a quantitative assessment of cashflows (eg, they include the rating agency's own qualitative assessment of the business' ownership model). Further, undertaking an assessment using the assumptions (eg, expenditure allowances and gearing) underpinning the building block revenue would not reveal any cashflow issues, as future capex is assumed to be financed according to the assumptions in the RoR allowance.
	Submitted that it supported the AER having access to additional data sets	Public Interest Advocacy	We have credit rating information for service providers. We note that the

527 CCP16, *Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, pp 6, 29.

528 Ergon Energy and Energex, *Issues Paper – Review of the Rate of Return Guidelines*, December 2017, p 3.

529 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, pp 54, 57, 61, 62.

530 NSG, *Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG),* May 2018, pp 12-13.

531 ACTO Gas Australia, Review of rate of return guideline – issues paper, December 2017, p 4.

532 ENA, *AER Rate of Return Guidelines – Response to Issues Paper*, December 2017, p 13.

533 ENA, *AER Review of the Rate of Return Guideline – Response to Discussion Paper and Concurrent Expert Evidence Sessions*, May 2018, p 14.

534 APA, *APA submission responding to AER issues paper*, December 2017, p 3.

	on areas such as financeability. MEU also supports the use of financeability measures as it considers that there is little information currently available on the service provider sector.	Centre (PIAC)[535] MEU[536]	credit ratings of service providers are currently around BBB+.
	Considers the use of financeability is not necessary, and supports the AER's current benchmark approach (which provides businesses with incentives to operate efficiently).	Spark Infrastructure[537]	As discussed above, we consider that the use of financeability assessments is not informative in determining the allowed RoR.
Using financeability as a 'cross-check' on the RoR	Supports the use of financeability as it provides a useful cross-reference regarding the relationship between regulatory returns and the broader performance of the business. However, the principles set out in the guideline must maintain primacy in determining how the actual return is derived.	Origin Energy[538]	Whilst the RoR comprises a large component of building block revenue, it is not the sole determinant of cashflows. Also, financeability assessments that credit rating agencies undertake, incorporate the actual performance of the businesses, which may include differences from our regulatory benchmark allowances.
	Considers that such tests can be used to examine the financial sustainability of a proposed determination, but they should not be used to directly determine the return on equity or the overall rate of return allowed.	CCP[539], Ergon Energy and Energex[540] CCP[541]	Undertaking a financeability assessment of our determination would not be informative, if based on the assumptions underpinning the building block revenues. Also, if based on the actual costs of the business then we could be introducing potential inefficiencies.
Analysis of historical profitability			
Relevance of profitability in determining the RoR	Information on profitability is largely irrelevant (has no role) in assessing the allowed rate of return. The ENA also added that there is no clear link with any RoR parameter; historical measures are not relevant to a forward-looking incentive regime; and a large number of factors can affect the actual profitability of a business.	APA[542], Network Shareholder Group[543] APA[544], Energy Networks Association[545]	We consider that there are limitations to the use of historical profitability analysis to inform our RoR decision - if a business' actual costs were to equal its regulatory allowances, then it should only be able to earn its allowed return on equity. However, for debt costs, careful consideration of profitability measures may inform

535 PIAC, *Submission on rate of return guideline review issues paper*, December 2017 p 1.

536 Major Energy Users, *Review of the rate of return guidelines*, December 2017, p 14.

537 Network Shareholder Group, *Response to Issues Paper on the review of the Rate of Return Guidelines*, December 2017, p 13.

538 Origin Energy, *Review of rate of return guidelines*, December 2017, p 2.

539 CCP16, *Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, p 6.

540 Ergon Energy and Energex, *Issues Paper – Review of the Rate of Return Guidelines*, December 2017, p 3.

541 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, p 64.

542 APA, *APA Submission responding to the AER issues paper*, December 2017, p 3.

543 Network Shareholder Group, *Submission on the Rate of Return Guideline review*, May 2018, p 10;

544 APA, *APA submission responding to discuss papers and expert evidence*, May 2018, pp 3-4.

545 ENA, *AER Review of the Rate of Return Guideline – Response to Discussion Paper and Concurrent Expert Evidence Sessions,* May 2018, pp 12-13.

			us as to whether a business' actual cost of debt has been systematically higher or lower than the rate assumed in the RoR.
	Submitted that a potential profitability framework should not disrupt the incentive framework that businesses have to outperform targets.	APGA[546]	We agree - under incentive based regulation if a business is able to achieve efficiencies then it is able to keep part of the benefits.
	Submitted that it supported the AER using a performance measurement framework and having access to detailed financial data from companies. It referred to work completed by the Sapere Group which claimed that under the current guideline, network owners can exceed efficient costs, prices and profits.	Agricultural Industries Energy Task Force[547]	We intend to commence collecting and reporting on the profitability measures identified in our Draft Position Paper on our Profitability Reporting Framework. However, if a business achieves greater efficiencies than our allowances then it is able to retain part of the benefits, which would manifest in its actual return on equity being higher than its regulatory allowance.
	Supports the use of overall financial performance measures, particularly given year-to-year performance can be influenced by many factors.	ATCO Gas Australia[548]	We agree that financial performance measures can be affected by many factors and so we would need to carefully understand the drivers before using them in decision making. Also, as noted above, we consider that careful consideration of performance measures may be useful in informing the cost of debt inputted into the RoR.
	Supports the use of profitability measures and submitted that it considered the profitability of the Queensland networks were substantially higher than other energy supply industry participants.	Queensland Council of Social Services[549]	As noted above, we consider that careful consideration of financial performance measures may be useful in informing the cost of debt that should be applied in the RoR.
	Supports the use of profitability measures to monitor the actual performance of the RoR. Notes that there is currently no data on the returns actually achieved against which to compare modelled returns.	CRG[550]	As outlined in our Draft Position Paper, we intend to commence collecting and reporting on profitability measures. This may help inform analysis of our overall regulatory framework. However, as discussed above, whilst careful consideration of profitability measures (from financial statements) may be useful in informing the cost of debt to apply in our RoR, it would not be helpful in setting the return on equity.
Using analysis of historical	Supports the use of profitability as it provides a useful cross-reference	Origin	As discussed above, we consider that profitability measures have limited

546 APGA, *Submission to the AER – Review of rate of return guideline*, May 2018, p 21.

547 Agricultural Industries Energy Taskforce, *Submission on rate of return issues paper*, December 2017, p 3.

548 ACTO Gas Australia, *Review of rate of return guideline – issues paper,* December 2017, p 4.

549 QCOSS, *Submissions on review of Rate of Return Guideline*, May 2018, pp 16-17;

550 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p 29.

profitability as a 'cross-check' on the RoR	regarding the relationship between regulatory returns and the broader performance of the business. However, the principles set out in the guideline must maintain primacy in determining how the actual return is derived.	Energy[551]	use in informing the RoR (the exception potentially being the cost of debt). However, it may assist in setting expenditure allowances and other regulatory allowances eg, if businesses are systematically incurring costs that are lower than our allowances.
	Information on profitability is potentially useful in testing the reasonableness of the AER's determinations. However, considers that it is difficult to use this information directly to inform the rate of return, as there are a range of factors that impact profitability.	Ergon Energy and Energex[552]	As per our response above, we consider that profitability measures have limited use to inform our RoR. We agree that there are a range of factors that may impact the profitability of businesses.
	Historical profitability measures can be used to assess whether actual profitability has been higher or lower than the allowed RoR, and other comparable businesses. However, as they are backward looking measures, they provide limited guidance on expected returns. Whilst this information cannot be used at a parameter level, it can inform the overall exercise of judgement in setting the RoR, or reviewing other elements of the regulatory regime. Ergon Energy and Energex additionally submitted that there are a range of factors that can impact profitability, hence it is difficult to use this information to directly inform the rate of return.	CCP[553] CCP[554]	As discussed above, whilst historical profitability measures may be useful in informing the cost of debt to apply in our RoR, it would not be helpful in setting the return on equity – nor would it assist in applying judgement in deciding the return on equity.

551 Origin Energy, *Review of rate of return guidelines*, December 2017, p 2.

552 Ergon Energy and Energex, *Issues Paper – Review of the Rate of Return Guidelines*, December 2017, p 3.

553 CCP16, *Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, pp 26-28.

554 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, pp 66-67.

4 Benchmark gearing ratio

In chapter 3 we considered that the allowed rate of return should be calculated as the weighted average of the return on debt and return on equity (the weighted average cost of capital or WACC). The gearing ratio is used to weight the expected required returns on debt and equity to derive the WACC.

Our decision is to adopt a gearing ratio for the purpose of deriving the WACC[555] to be 60 per cent. This is based on a benchmarking approach and examining relevant empirical evidence based on market data. We are satisfied that a 60 per cent gearing ratio, and our empirical benchmarking approach to estimating this ratio, will contribute to the achievement of the legislative objectives to the greatest degree.

We consider an empirical benchmarking approach will contribute to the achievement of the legislative objectives because it both provides incentive for service providers to adopt efficient gearing structures and also prevents exposing consumers to variabilities of gearing levels adopted by individual service providers.[556] Empirically estimating gearing ratios is also consistent with our empirical estimation of equity beta and credit rating.[557]

Our empirical estimation of a benchmark gearing ratio is based on evidence from a comparator set of listed Australian service providers. 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 service providers allows us to consider market gearing values. Market values have been accepted by our engaged experts as being more appropriate than book values.[558] The use of market and book values, and of the appropriate comparator set, is further considered in section 4.2 below.

As outlined in chapter 2, we consider that an empirical benchmarking approach using market data and a comparator set reflective of the risks involved in providing regulated services will contribute to the achievement of the legislative objectives.

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555 We note that we are currently reviewing our regulatory tax approach. Under our current approach the benchmark gearing ratio is an input into our regulatory tax allowances as it determines the tax interest shield. Our consideration of gearing in this decision is only for the purposes of weighting the returns on debt and equity, and have not considered the appropriate interest tax shield here.

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

557 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.

558 CEPA, *Expert Joint Report,* April 2018, p.27.

Results of our empirical analysis are presented in section 4.1 below.[559] This analysis shows that the average gearing level of our comparator set over the past 5 years is 54 per cent, and over the past 10 years is 61 per cent, based on market values. We have estimated averages over the past 5 and 10 years as we consider that this provides enough observations to make a reliable estimate. Having regard to both 5 and 10 year historical averages allows us to consider both the relevancy of more recent data and the reliability of a longer time period. The sample period and data set is further considered in section 4.2 below.

Our estimation method is consistent with the approach adopted in the 2013 Rate of return guidelines and 2009 review of WACC parameters.[560]

4.1 Updated empirical estimates

[559] 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.

[560] AER, Rate of return guideline, December 2013; AER, Final Decision, Review of the WACC parameters, May 2009.

Table 14 presents gearing estimates for five comparator businesses[561] over the past ten years using market values of equity and debt (with book value of debt used as a proxy for the market value of debt). The average gearing level of our comparator set over the 10 years to 2017 is 61 per cent, and 54 per cent in the last 5 years to 2017.

[561] Choice of the comparator businesses is discussed in section 2.4.

Table 14 AER gearing estimates based on market values

	ENV	APA	DUE	AST	SKI	AVE
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%	59%	58%
2016	N/A	49%	51%	57%	53%	52%
2017	N/A	49%	N/A	52%	51%	51%
5 year average	50%	48%	62%	56%	56%	54%
10 year average	65%	54%	70%	60%	60%	61%

Notes: 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. AST estimates are as at 31 March each year. All other estimates are as at 30 June each year. The average for all firms in a year does not make any adjustment for these timing differences.

Source: Annual reports and financial statements for each company, AER analysis

Table 15 presents gearing estimates for five comparator businesses over the past ten years using book values of both equity and debt. The average gearing level of our comparator set over the 10 years to 2017 is 70 per cent, and 68 per cent in the last 5 years to 2017.

Table 15 AER gearing estimates based on book values

	ENV	APA	DUE	AST	SKI	AVE
2006	91%	67%	82%	57%	81%	76%
2007	90%	69%	75%	57%	80%	74%
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%	69%	70%
2016	N/A	71%	65%	66%	68%	67%
2017	N/A	71%	N/A	64%	68%	68%
5 year average	71%	68%	73%	65%	68%	68%
10 year average	77%	68%	76%	63%	72%	70%

Source: Annual reports, AER analysis

4.2 Estimation approach and response to submissions

The approach to estimating a benchmark gearing ratio set out in our 2013 Guidelines was discussed in our February 2018 gearing discussion paper.[562] In this decision we have maintained this approach. We note that there was a high degree of agreement among stakeholders[563] and experts participating in the concurrent expert evidence sessions that this approach to estimating gearing remains appropriate.

CCP16, SA Power Networks, CitiPower, Powercor, Australian Gas Infrastructure Group, United Energy, Ergon Energy, Energex, ENA, Evoenergy, APA, APGA, Jemena, and the Network Shareholder Group all supported maintaining this approach. In contrast, the Agricultural Industries Energy Taskforce,[564] Canegrowers,[565] and MEU[566] submitted that the gearing approach may result in a gearing ratio that is too

562 AER, Discussion Paper – Gearing, February 2018.
563 See section 4.3 - Summary of submissions
564 Agriculture Industries Energy Taskforce, Submission on rate of return issues paper, Dec 2017, p. 10.
565 Canegrowers, Submission on rate of return issue paper, Dec 2017, p. 3.
566 MEU, Submission on rate of return issue paper, Dec 2017, p. 3.

high. The CCP16 submitted that the gearing ratio is unlikely to have a material effect on the overall rate of return, stating:[567]

> changes in the gearing have a relatively small effect on the ROR. This is because as gearing rises so does the equity beta due to the greater concentration of risk on equity. Hence, a higher gearing does not necessarily result in a lower ROR as the benefit of greater use of lower-cost debt is offset by the higher cost of equity.
>
> Given this, while the AER should update the underlying empirical analysis and review its approach, we do not expect, a priori, that the AER should change its approach.

These submissions are considered in the sections below and in section 4.3.

Market and book values of equity

In our 2013 Guidelines we considered gearing estimates from both market and book values of equity, with primary weight on estimates from market values.

The Network Shareholder Group, APA, APGA, and the ENA all submitted that market values should be used to estimate gearing.[568] The Network Shareholder Group noted that book values are "simply a historical value and will almost never have an impact on the cost of financing debt or equity".[569] Similarly, the ENA submitted that the rate of return reflects the market-clearing cost of capital and other rate of return parameters are based on market values, therefore gearing should also be derived from market values.[570]

CCP16 submitted that we should consider both book and market values, that primary weight should be on market values, but that book values allow for a larger sample of firms.[571]

In the concurrent expert evidence sessions the experts agreed that market-based estimates are the only appropriate measure of gearing.[572]

We consider that primary weight should be placed on gearing estimates from market values. We note that 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 is important given the relationship between leverage risk and equity beta, and the estimation of equity beta from returns data of listed equity.

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567 CCP16, Submission of Rate of Return Guideline review, May 2018, p. 50.

568 Network shareholder group, Submission of Rate of Return Guideline review, May 2018, p. 14; APA, Submission of Rate of Return Guideline review, May 2018, p. 20; APGA, Submission of Rate of Return Guideline review, May 2018, p. 14; ENA, Submission of Rate of Return Guideline review, May 2018, p. 32

569 Network shareholder group, Submission of Rate of Return Guideline review, May 2018, p. 14.

570 ENA, Submission of Rate of Return Guideline review, May 2018, p. 32.

571 CCP16, Submission of Rate of Return Guideline review, May 2018, p. 47.

572 AER, Evidence session 1 & 2, Expert Joint Report, April 2018, p. 27.

Comparator set

The ENA and the Network Shareholder Group submitted that are current comparator set remains appropriate.[573] The Network Shareholder Group submitted that a comparator set of Australian listed energy networks provides a reasonable reflection of the degree of risk involved in providing regulated services, and that Australian firms are most relevant to ensure equivalence of tax regime and legal framework for bankruptcy.[574]

CCP16 submitted that given the small number of service providers for which data is available, we should also consider the gearing benchmarks used by other regulators. CCP16 submitted that while gearing may be affected by country and sector specific factors, such as thin capitalisation rules, length of the regulator period, and the design of incentive mechanisms, the gearing assumptions used by other regulators in the sector can help establish a plausible range for the gearing benchmark.[575]

We consider that our current comparator set and sample period provides sufficient data for a reliable gearing estimate, and do not consider that adding gearing estimates from other sectors or countries is required. We also note that there are interrelationships between leverage risk and equity beta, and leverage risk and the return on debt. The overall level of risk of providing regulated services may be an important consideration for investors and managers of service providers. As the overall level of (systematic) risk of providing regulated services may differ between sectors and countries, we consider it is appropriate to place greater weight on gearing estimates from Australian listed service providers.

Sample period

In our 2013 Guidelines we considered gearing estimates from comparable businesses over a historical ten year period.[576] CCP16 submitted that long term averages of at least 5 years should be used.[577] APGA submitted that the benchmark gearing ratio should be based upon a long-run average.[578]

In the concurrent expert evidence sessions the experts agreed that, conceptually, gearing should not change regularly as the core capital structure decisions of companies are stable.[579] The experts agreed that gearing choices typically reflect a long-term investment strategy so market evidence should be averaged over 5-10

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573 ENA, Submission of Rate of Return Guideline review, May 2018, pp. 32; Network shareholder group, Submission of Rate of Return Guideline review, May 2018, pp. 14.

574 Network shareholder group, Submission of Rate of Return Guideline review, May 2018, pp14.

575 CCP16, Submission of Rate of Return Guideline review, May 2018, pp51.

576 AER, Explanatory Statement - Draft rate of return guideline, August 2013, pp. 179-180.

577 CCP16, Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions, May 2018, p. 52.

578 APGA, Submission of Rate of Return Guideline review, May 2018, pp14.

579 CEPA, Evidence session 1 & 2, Expert Joint Report, April 2018, pp. 28.

years. The experts also agreed that share price movements and changes in the market capitalisation of a listed company could distort short run gearing estimates.[580]

We agree with these submissions for the reasons they have provided, and have considered long term (five and ten year) averages of annual gearing estimates. We also consider that it is generally desirable to have a consistent approach to estimating rate of return parameters and have therefore tended to adopt a consistent period and frequency across all rate of return parameters (where possible). We note that our empirical analysis of equity beta and credit ratings involves consideration of data over a relatively long time period of five to ten years or more.

Hybrid securities

Hybrid securities are securities that have characteristics of both debt and equity. In our 2013 Guidelines we noted that Envestra and Spark Infrastructure had shareholder loan notes that are included as debt for accounting purposes but had the following characteristics of equity:

- they were stapled to each share, with no separate existence without the share (that is, they cannot be traded independently),
- they were subordinate to all other creditors; and
- returns on the notes were not guaranteed and only payable to the extent to which there is available cash.

In our 2013 Guidelines we considered that these loan notes should be treated as equity.

Since publishing our discussion paper we have become aware of additional loan notes attributable to Spark Infrastructure that were not adjusted for in the gearing estimates in the discussion paper. Consistent with the treatment of other loan notes, we have removed these additional loan notes from our measures of debt when estimating gearing ratios in this decision.[581]

More recently, AusNet Services has successfully priced two hybrid security issues in the form of non-convertible subordinated notes. These subordinated notes differ from shareholder loan notes of Envestra and Spark Infrastructure in that they are not stapled to the shares of AusNet Services.

The CRG submitted that given the significantly reduced risk of default in regulated utilities, the risk profile of subordinated and unsubordinated debt is very similar and should be afforded the same return. CRG submitted that subordinated debt has a lower risk profile than equity, and can't simply be afforded the same return as equity.

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[580] CEPA, Evidence session 1 & 2, Expert Joint Report, April 2018, pp30.

[581] We have also updated our gearing estimates for Spark Infrastructure to account for their ownership stake in Transgrid, which was not accounted for in estimates presented in our discussion paper.

The CRG submitted that this would over-reimburse infrastructure owners and may require a change to the binary debt v equity treatment of returns.[582]

Given the relative size of AusNet Services' current level of debt and hybrid securities, we note that adjusting for these hybrid securities is unlikely to have a material impact on the overall gearing estimates. For this reason, and noting that the subordinated notes are not stapled to shares, we have not removed these hybrid securities from measures of AusNet Services debt.

4.3 Summary of submissions

This section details the submissions we have received from stakeholders as part of our review process to date, and notes how we have had regard to each submission.

Table 16 Summary of submissions on benchmark gearing

Key Point	Submission	Stakeholder	AER Response
Benchmark gearing ratio	Benchmark gearing ratio should remain at 60 per cent	Joint Energy Networks, APA, APGA, CCP16, CRG, ENA, Evoenergy, NSG, Jemena, Ergon Energy, Energex[583]	Our decision is for a benchmark gearing ratio of 60 per cent.
	Incorrect gearing assumptions will result in the AER providing 'return on capital' allowances well above the required levels	Agricultural Industries Energy Taskforce[584]	We consider that our benchmark gearing ratio of 60 per cent, as based on an empirical benchmarking approach, will contribute to the achievement of the legislative objectives.
	Our current estimate appears to be a departure from the gearing that service providers apply to the regulated parts of their businesses.	Canegrowers[585]	Our benchmark gearing estimate is based on empirical analysis of listed Australian service providers. We note that for SKI, ENV, AST, and DUE a relatively large proportion of total revenue is (was) regulated.
	The gearing approach needs to be modified to reflect the reality that the RAB includes a significant element of	MEU[586]	This issue was considered in detail in our 2017 review of our regulatory treatment of inflation. We consider that our current treatment of inflation, including indexation of the

582 CRG, Submission of Rate of Return Guideline review, May 2018, pp. 38-39

583 CCP16, Submission of Rate of Return Guideline review, May 2018, p. 50; CRG, Submission of Rate of Return Guideline review, May 2018, pp21; APA, Submission of Rate of Return Guideline review, May 2018, p.21; Joint Energy Network, Submission of Rate of Return Guideline review, May 2018, p. 32; APGA, Submission of Rate of Return Guideline review, May 2018, p.14; ; ENA, Submission of Rate of Return Guideline review, May 2018, p.7 ; Evoenergy, Submission of Rate of Return Guideline review, May 2018, p.1 ; NSG, Submission of Rate of Return Guideline review, May 2018, p.14 ; Jemena, Submission of Rate of Return Guideline review, May 2018, p.4 ; Ergon Energy & Energex, Submission of Rate of Return issues paper, December 2017, pp. 3-4

584 Agricultural Industrial Energy Taskforce, Submission of Rate of Return Guideline review, December 2017, p.10.

585 Canegrowers, Submission on Rate of return issues paper, December 2017, p.3.

586 MEU, Submission on Rate on return issues paper, December 2017, p.10

	retained inflation and assets that do not contribute to the provision of the services.		regulatory asset base, will contribute to the achievement of the legislative objectives.
Market vs RAB	Gearing should be estimated on market value.	APA, APGA, CCP16, ENA, NSG, Ergon Energy, Energex[587]	We consider that the use of market values is most reflective of the market's assessment of risks involved in providing regulated services.
Parent company debt	The approach to parent company debt and 'double leverage' used in our 2013 Guidelines is appropriate.	CCP16[588]	Our decision is based on an empirical approach that is consistent with the treatment of double leverage used in our 2013 Guidelines. That is, we have adjusted Spark Infrastructure's reported gearing measure to account for its minority ownership in SA Power Networks, Victoria Power Networks, and Transgrid.
Sample period	Gearing should be measured over the long term and the benchmark based on observed levels of gearing over at least 5-10 years	CCP16, NSG, APA[589]	We have considered both 5 and 10 year empirical estimates.
Hybrid securities	The approach adopted in our 2013 Guidelines regarding hybrid securities and loan notes should be continued.	CCP16[590]	Our decision is based on an approach to hybrid securities and loan notes that is consistent with that of our 2013 Guidelines.
	The risk profile of subordinated and unsubordinated debt is very similar and should be afforded the same return.	CRG[591]	We consider that subordinated debt that is stapled to shares (such as Envestra and Spark Infrastructure's loan notes) must be treated as equity. However, we have not adjusted our measure of AusNet Services debt to remove its unstapled subordinated debt.
	Subordinated debt has a lower risk profile than equity, and can't simply be afforded the same	CRG[592]	We consider that subordinated debt that is stapled to shares (such as Envestra and Spark Infrastructure's loan notes) must be treated as

[587] CCP16, Submission of Rate of Return Guideline review, May 2018, p.52; APA, Submission of Rate of Return Guideline review, May 2018, pp 20-21; NSG, Submission of Rate of Return Guideline review, May 2018, p.14; APGA, Submission of Rate of Return Guideline review, May 2018, p.14; ENA, Submission of Rate of Return Guideline review, May 2018, pp. 32-34; Ergon Energy & Energex, Submission of Rate of Return issues paper, December 2017, pp. 3-4

[588] CCP16, Submission of Rate of Return Guideline review, May 2018, pp. 52-53.

[589] CCP16, Submission of Rate of Return Guideline review, May 2018, p.52; APA, Submission of Rate of Return issues paper, December 2017, p 4; NSG, Submission of Rate of Return Guideline review, May 2018, p.14

[590] CCP16, Submission of Rate of Return Guideline review, May 2018, p.52.

[591] CRG, Submission of Rate of Return Guideline review, May 2018, pp. 38-39

[592] CRG, Submission of Rate of Return Guideline review, May 2018, pp. 38-39

	return as equity.		equity. However, we have not adjusted our measure of AusNet Services debt to remove its unstapled subordinated debt.
Appropriate comparators	Given the small number of service providers for which data is available, we should also consider the gearing benchmarks used by other regulators to define a plausible range for the benchmark gearing.	CCP16[593]	We consider that a comparator set of Australian service providers will best reflect the regulatory and commercial risks involved in providing regulated services. We consider that there is sufficient data from this comparator set.
	The AER should consider different gearing ratios for different industries and/or sectors.	APA[594]	As set out in section 2.4, we consider that the regulatory and commercial risks involved in providing regulated gas and electricity services are sufficiently similar to warrant a single benchmark.
	It is unclear on how the AER has approached the task of stripping from the market data the consequence of these firms not being pure play providers of regulated services.	ECA, EUAA[595]	We acknowledge that the firms in our comparator set have varying degrees of unregulated activities. We take this into account when exercising our regulatory judgment in determining a benchmark gearing ratio. However, we have not calculated any explicit adjustments to the data for this issue, and we consider that this comparator set is the best available.
	It is unclear to what extent the AER has assessed that each of the entities is 'efficient.'	ECA, EUAA[596]	We have not formed a view on the efficiency of the firms in our comparator set. Rather, as set out in chapter 2, we consider that a regulatory gearing ratio that is: • set ex ante, • benchmarked to firms with a similar degree of regulatory and commercial risks as those involved in providing regulated services, and • based on market data, will promote efficiency and the contribute to the achievement of the legislative objectives.

593 CCP16, Submission of Rate of Return Guideline review, May 2018, p.52

594 APA, Submission of Rate of Return Guideline issues paper, December 2017, p. 5.

595 ECA, Submission of Rate of Return Guideline issues paper, December 2017, p. 17; EUAA, Submission of Rate of Return Guideline issues paper, December 2017, pp. 7-8.

596 ECA, Submission of Rate of Return Guideline issues paper, December 2017, p. 17; EUAA, Submission of Rate of Return Guideline issues paper, December 2017, pp. 7-8.

Gearing and tax	The approach to benchmarking gearing is providing an excessive tax allowance.	ECA[597]	These Guidelines set a benchmark gearing ratio for the purposes of weighting the returns on debt and equity. Our review of tax will consider the role of a gearing ratio in calculating the allowed tax building block.

Source: Agriculture Industries Energy Taskforce, Submission on rate of return issues paper, Dec 2017, p. 10. Canegrowers, Submission on rate of return issue paper, Dec 2017, p. 3. MEU, Submission on rate of return issue paper, Dec 2017, p. 3.

[597] ECA, Submission of Rate of Return Guideline issues paper, December 2017, p. 11

5 Overall approach to return on equity

We estimate the expected return on equity using the approach we developed in our 2013 Guidelines after extensive stakeholder consultation and implemented since then in all of our regulatory determinations. It was affirmed by the Australian Competition Tribunal.[598] [599]

5.1 Foundation model approach

Our approach is known as the foundation model approach and comprises of six steps as set out below.

Step 1 – identify relevant material

Step 2 – determine role/ how best to employ relevant material including determining the foundation model (SLCAPM)

Step 3 – implement foundation model. Determine SLCAPM input parameter ranges and point estimates.

Step 4 – other information. Estimate other information used to inform overall return on equity

Step 5 – evaluate information from step 3 and 4.

Step 6 – distil return on equity point estimate. Use SLCAPM point estimate as starting point and select final return on equity value having regard to information from steps 4 and 5.

Most experts at the concurrent evidence sessions agreed that we should maintain the foundation model approach and focus on its application in light of the evidence that has evolved. David Johnstone noted the need to consider the whole rate of return rather than focussing only on the model outcome.[600]

Implementing the foundation model is a key step in our six step approach and has survived the test of time. We undertook extensive consultation and assessed a number of models including the dividend growth model (DGM), Black CAPM and the Fama

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[598] Since the Tribunal decision in 2016, disagreements amongst stakeholders on the allowed return on equity was largely driven by differences in opinion on how best to exercise judgment given the uncertainty/imprecision of the evidence, rather than the six step foundation model approach.

[599] The Australian Competition Tribunal reviewed our return on equity estimate based on our foundation model approach on appeal by stakeholders and found that there was no reviewable error. See, *PIAC – AusGrid*, [2016] *ACompT* 1.

[600] Cambridge Economic Policy Associates, *Joint Expert Report, RORG review – Facilitation of concurrent evidence sessions,* 21 April 2018, section 2.1.3, p.19.

French model for suitability as the foundation model before deciding on the SLACPM. Our comprehensive assessment is in the 2013 Guidelines.[601] [602]

The foundation model approach provides a framework for systematically considering relevant information and then exercising our judgement on the appropriate choice of the regulated return on equity. The approach recognises that our task requires us to exercise judgement because we are estimating a forward looking return on equity that will satisfy the national electricity and gas objectives. Further, the information available to inform our decision is imprecise, incomplete and, to some extent, conflicting.

Submissions were generally supportive of maintaining the foundation model approach:

- The Network Shareholders Group (NSG) supported the continued use of our foundation model approach in this 2018 Guideline.[603]
- The Energy Networks Australia (ENA) agreed with the general view at the expert concurrent evidence sessions that the foundation model should be a given and the focus should be on updating parameter estimates in light of new evidence since 2013.[604]
- Evoenergy, considered the adoption of the foundation model for the new Guideline appropriate.[605]
- APA accepts the continued use of our foundation model approach at this time but notes that a thorough review of the approach is warranted at the next review (in 2022).[606] The Australian Pipeline & Gas Association (APGA) submits that our review should start from the current foundation model approach and change only if risks and market conditions have changed materially.[607]
- The CRG raised concerns about the efficacy of using the CAPM but noted that thorough investigation would be required prior to determining an alternative approach.[608]

We agree that the foundation model approach should be continued and adopted in this 2018 Guideline review for estimating the return on equity. In this context, we will update the relevant data and review new evidence so that our judgement can be exercised within the established approach to estimating the allowed return on equity. We consider that this provides the necessary certainty and predictability that

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601 AER, *Explanatory statement, Rate of Return Guideline*, 2013, section 5; AER, *Explanatory statement appendices, Rate of Return Guideline*, 2013, Appendix A – *Assessment of models*. Available at: https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/rate-of-return-guideline-2013

602 Section 2.4 of this decision discusses submissions relating to our use of the CAPM in this 2018 review process.

603 NSG, *Submission on the RORG review*, 4 May 2018, p.12.

604 ENA, *Response to discussion papers and concurrent evidence sessions*, 4 May 2018, 44.

605 Evoenergy, *Review of the rate of return guideline – evidence sessions*, 4 May 2018

606 APA, *Submission in response to discussion papers and expert evidence*, 4 May 2018, p.1.

607 APGA, *Submission to the AER review of the rate of return guideline*, 4 May 2018, p.2.

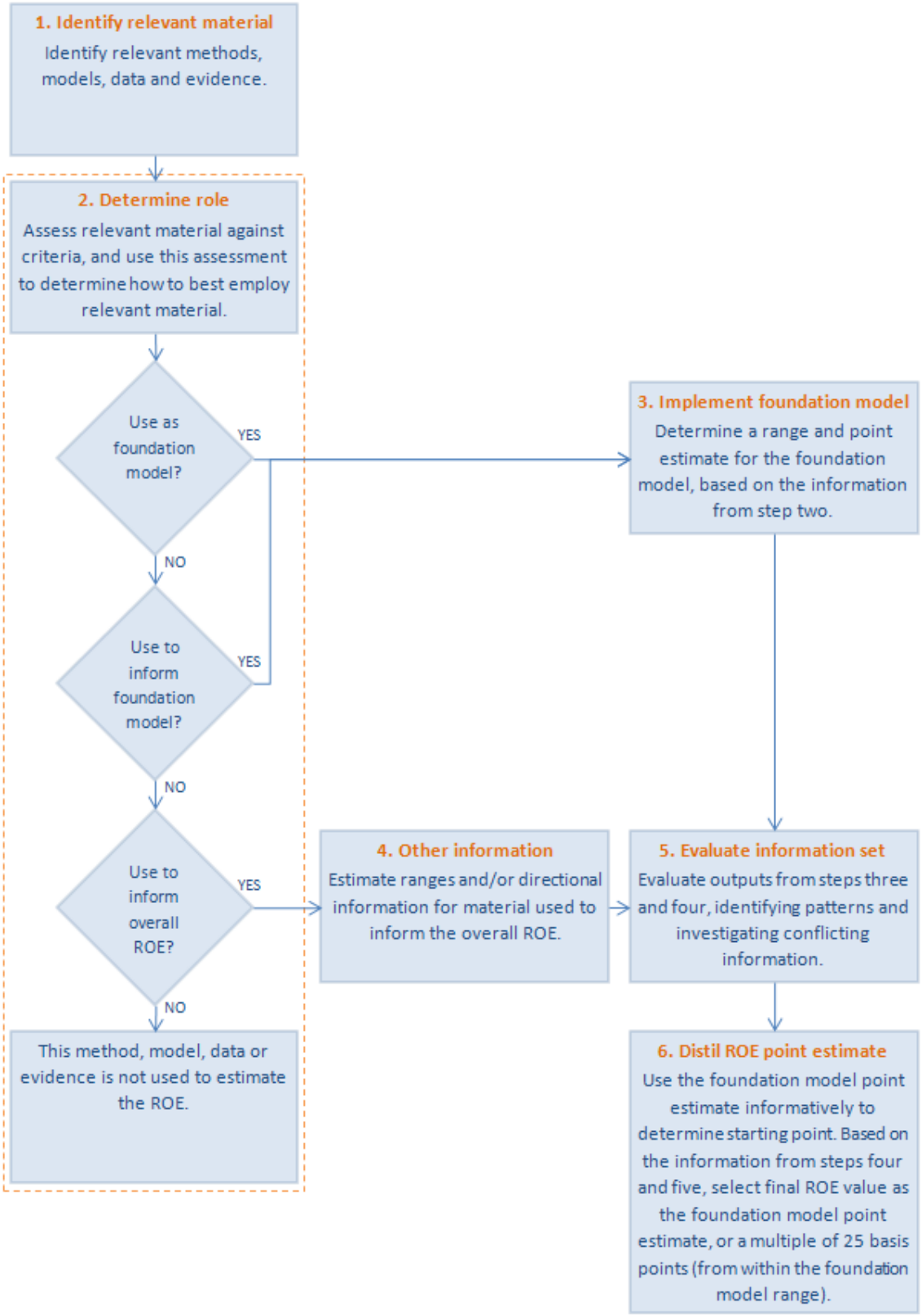
608 CRG, *Submission to the AER rate of return guideline review*, May 2018, p.37.

stakeholders have said they value whilst allowing us to conduct our regulatory task in a manner that is most likely to contribute to the legislative objectives.[609]

We acknowledge that these Guidelines could be binding unlike the 2013 Guidelines, for which the current legislative framework allows both the service providers and ourselves the opportunity to depart if the evidence justified that doing so would result in an outcome that better achieves the allowed rate of return objective. Although departures were available we stated that we would not do so lightly as this may undermine certainty and predictability and also undermine the extensive consultation process undertaken in developing the guidelines. We continue to place high importance on certainty and predictability and consider that the estimate of expected return on equity based on our foundation model approach is unbiased, recognises uncertainties and has appropriate regard to all relevant information. Therefore, we consider our foundation model approach is suitable for determining return on equity parameters to use under binding Guidelines.

[609] This approach is consistent with the CCP16's submission that, incremental change means continuing to work within the CAPM and foundation model framework, not limiting the exercise of our statutory obligations to satisfy a self-imposed 'incremental approach' and considering all available data. See, CCP 16, *Submission to the AER on its rate of return guideline review concurrent evidence sessions*, 4 May 2018, section 3.1, pp. 14-16.

Figure 10 Foundation model approach flowchart



5.2 Identify relevant material and determine role (Steps 1 and 2)

Overall, we have not identified any additional classes of material that we did not consider when preparing our 2013 Guidelines. Therefore, the list of material we employed in 2013 remains appropriate. This conclusion was supported in the concurrent evidence sessions and in submissions.

We also consider that we should assign the same roles to each piece of material as we did in 2013. However, when implementing step 3 within our overall framework, and based on new evidence and current material, we are persuaded that we should adjust the relative merit assigned to some pieces of material in exercising our judgement to determine a return on equity that will contribute to achieving our legislative objectives.

The list of relevant material, the roles assigned and the relative merit in 2018 are set out in Table 17.

Table 17 Relevant material and role

Material (step one)	Role in 2013 (step two)	Role in 2018 and relative merit
Sharpe–Lintner CAPM	Foundation model	No change
Black CAPM	Inform foundation model parameter estimates (equity beta)	No change in role. However, at this time we have diminished confidence in the robustness of the Black CAPM and are therefore not persuaded to select an equity beta towards the top of the observed empirical estimates
Dividend growth models	Inform foundation model parameter estimates (MRP)	No change in role. However, at this time we have diminished confidence in the robustness of DGMs and are therefore not persuaded to select an MRP towards the top of the observed empirical estimates of historical excess returns.
Fama–French three factor model	No role	No change
Commonwealth government securities	Inform foundation model parameter estimates (risk free rate)	No change
Observed equity beta estimates	Inform foundation model parameter estimates (equity beta)	No change
Historical excess returns	Inform foundation model parameter estimates (MRP)	No change
Survey evidence of the MRP	Inform foundation model parameter estimates (MRP)	No change
Implied volatility	Inform foundation model parameter estimates (MRP)	No change
Other regulators' MRP estimates	Inform foundation model parameter estimates (MRP)	No change
Debt spreads	Inform foundation model parameter	No change

	estimates (MRP)	
Dividend yields	Inform foundation model parameter estimates (MRP)	No change
Wright approach	Inform the overall return on equity	We have diminished confidence in the robustness of the Wright approach. .
Takeover/valuation reports	Inform the overall return on equity	No change
Brokers' return on equity estimates	Inform the overall return on equity	No change
Other regulators' return on equity estimates	Inform the overall return on equity	No change
Comparison with return on debt	Inform the overall return on equity	No change
Trading multiples	No role	No change
Asset sales	No role	No change
Brokers' WACC estimates	No role	No change
Other regulators' WACC estimates	No role	No change
Finance metrics	No role	No change

Source: AER analysis.

5.3 Implement the foundation model (step 3)

In summary, after assessing the relevant evidence we consider the best estimates for the SLCAPM parameters are:

- A formula for calculating the risk free rate based on yields on 10-year Commonwealth Government Securities (CGS)
- A value of 0.6 for equity beta
- A value of 6 per cent for market risk premium.
- These parameter input point estimates and reasons are discussed in chapters 6, 7, and 8.

5.4 Step 4 - 6 of the foundation model approach

Steps 4-6 are where we have regard to other information, evaluate and then determine the final return on our equity point estimate (sometimes referred to as 'cross checks'). Our approach to other information was set out in our 2013 Guidelines.[610]

[610] AER, *Explanatory statement appendices, Rate of Return Guideline*, 2013, Appendix B – Other information.

Whilst there was consensus that we should apply our foundation model approach, we note that experts and stakeholders submitted divergent views on the role of cross checks. These concerns were mainly focused on the role of additional information to inform the AER in exercising its judgement on the appropriate overall rate of return. Nevertheless, these comments although not directly concerning the return on equity, have some relevance to our foundation model approach steps 4-6, as we apply cross checks.

Experts at our concurrent evidence session discussed whether there is an objective basis for an overall test of reasonableness of the rate of return. Some considered that all relevant evidence should be considered together rather than reserving some for 'cross checking' and noted the difficulty in finding a consistent and objective method for 'cross checking'. Some also expressed concern that 'cross checking' could result in 'backdoor' discretion and limit transparency. Graham Partington considered that there is a role for reasonableness checks and notes that doing otherwise could lead to unreasonable estimates of the cost of capital.[611]

CCP16 submitted that while the rate of return should be considered as a whole, cross checks are essential to judgement and discretion and inclusion would improve the overall rate of return and reduce biases at the parameter level.[612] It added that the current foundation model approach provides a sound framework that already provides for transparent and reasoned consideration of cross-checks in the exercise of discretion to determine the overall rate of return and parameter values.[613] The point was also made that without a sensibility check, too much faith is placed on the CAPM model and the precision of parameter models, than can be rationally supported [614]

The Network Shareholder Group agreed with most experts and noted that 'cross check' can either be 'elevated above all other considerations' or have no effect in determining the allowed rate of return.[615] They also noted that 'cross checks' weaken the quality of the process because, if action is taken, then the final adjustment is elevated above all other considerations circumventing rigour and transparency. If no action is taken, the Network Shareholder Group submitted that the cross check has no effect.

We consider our steps 4-6 are an integral part of our return on equity approach, although we acknowledge their limitations. These steps—in conjunction with the use of a foundation model—provides an appropriate balance between a relatively replicable and transparent process and providing flexibility to consider market circumstances. We consider this provides scope for more openness and flexibility to test the

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611 CEPA, *Expert Joint Report, RORG review – Facilitation of concurrent evidence sessions*, 21 April 2018, section 2.1.3.

612 CCP 16, *Submission to the AER on its rate of return guideline review concurrent evidence sessions*, 4 May 2018, p. 24.

613 CCP 16, *Submission to the AER on its rate of return guideline review concurrent evidence sessions*, 4 May 2018, p. 25.

614 CCP 16, *Submission to the AER on its rate of return guideline review concurrent evidence sessions*, 4 May 2018, p. 28.

615 Network Shareholder Group (NSG), *Submission on the Rate of Return Guideline review*, 4 May 2018, p.12

reasonableness of the final return on equity point estimate. This recognises that, ultimately our rate of return must meet legislative objectives and requires the exercise of judgement. Any potential adjustments will be reasoned against our legislative objectives. Based on the evidence in steps 4 and our evaluation under step 5, we may reconsider the foundation model input parameter estimates, or more fundamentally, we may also reconsider the foundation model itself. That said, we consider it reasonable to expect our final return on equity estimate, in most market circumstances, to fall within the foundation model range.

5.4.1 Step 4 – other information.

Under step 4, we set out the form of other information that will inform the overall return on equity estimate. As noted above under steps 1-2, we have assessed the information currently before us and found that no new material was presented leading us to change the list of material we employed or the roles we allocated to that material in 2013.

In section 3.3 we considered the information we received relating to profitability analysis, financeability analysis and RAB multiples as potential relevant material for estimating the rate of return. Our conclusion is that this material should not be given a role in estimating the expected return on equity. However, we agree that RAB multiples and historical profitability may provide useful contextual information and cause for further examination of the material we rely on when estimating rate of return parameters.

The additional information we will consider under step 4 is in Table 18 and is consistent with our 2013 Guidelines.[616]

Table 18 Other relevant information

Additional information	Form of information
Wright approach	Point in time
Other regulators' return on equity estimates	Point in time
Brokers' return on equity estimates	Point in time and directional
Takeover/valuation reports	Directional
Comparison with return on debt	Relative

Table 19 sets out the return on equity and equity risk premium range derived from other information.

[616] AER, *Better Regulation, Rate of Return Guideline*, December 2013, p.16.

Table 19 Return on equity range from other information

	Return on equity		Equity risk premium	
	Minimum	Maximum	Minimum	Maximum
AER Foundation Model*	4.84	7.84	2.2	5.2
Wright approach CAPM	5.6	10.6		
Independent Valuation reports[617]	9.03	9.23	4.44	4.62
Broker Reports - Unadjusted	6.2	8.4	3.5	5.0
Broker Report – Adjusted for Imputation	6.7	9.0	4.1	4.9
Other regulators decisions**	6.8	11.85	4.2	9.36

* Risk free rate of 2.64 percent. Equity beta range 0.4–0.8 and MRP of 5.5-6.5 percent.

** Period from March 2017 to March 2018.

5.4.2 Step 5

Under step 5, we evaluate the other information set. In undertaking this evaluation, consistent with our 2013 Guidelines, we may have regard to matters including:

- Patterns shown in other information
- The strengths and limitations of the other information
- The magnitude by which the other information suggests that the foundation model point estimate under or over estimates the expected return on equity (if at all)[618].

5.4.2.1 The Wright Approach

The Wright approach is in effect, a model that assumes a stable total market return, and by implication a perfect inverse relationship between the market risk premium and the risk free rate. Since the 2013 Guidelines we have received evidence that the model has no theoretical basis in Australia and is not an appropriate tool for regulatory use, nor is it used by market practitioners.[619] This view was supported at the expert sessions, but the converse view was also noted, that is, the return on equity does not

[617] Based on the most recent valuation report which is a KPMG report for DUET released on 7 March 2017.

[618] AER, *Better Regulation, Rate of Return Guideline*, December 2013, p.16.

[619] Rankin and Idil, *A century of Stock-Bond Correlations*, September 2014, Partington and Satchell, *Cost of Equity issues 2016 Electricity and Gas Determinations,* April 2016, pp30-31; Partington and Satchell, Report to the AER, May 2018, p.34-35, AER, Draft decision - Multinet Gas access arrangement 2018-22, Attachment 3 - Rate of return, p.220. Our analysis of independent valuation reports for the 2018 rate of return guideline review also indicated no reports appeared to use the Wright CAPM.

necessarily move one-for-one with movements in the risk free rate.[620] We therefore continue to observe results from the Wright model.

We estimate the return on equity under the Wright approach using a range for the long-term historical average return on the market. We use a range because the estimated return on the market will vary depending on the time period used.[621] The table below sets out our estimates of historical returns on the market portfolio. The nominal return ranges from 10.1 per cent to 12.6 per cent.

Table 20 Historical returns on the market portfolio (per cent)

Sampling period	Market return (real)	Market return (nominal)
1883–2017	8.6	11.3
1937–2017	7.4	10.1
1958–2017	8.9	11.6
1980–2017	9.8	12.6
1988–2017	9.2	11.9

Source: Handley, *An estimate of the historical equity risk premium for the period 1883 to 2011*, April 2012, p. 6. AER update for 2012–2017 market data.

Notes Historical market returns are estimated using arithmetic averages, assuming a theta value of 0.6, and assuming an inflation rate of 2.5 per cent. Nominal figures calculated by the AER using the Fisher equation: $1+i=(1+r)\times(1+\pi)$ where r denotes the real return, i denotes the nominal return and π denotes the inflation rate.

We estimate a return on equity under the Wright CAPM[622] by combining the historical nominal market return with our prevailing risk free rate estimate[623] and equity beta estimate.[624] As shown in Table 21, our estimated range for equity beta and market return results in Wright CAPM return on equity estimates ranging from 5.6 to 10.6 per cent.

Table 21 Wright CAPM return on equity (per cent)

AER equity beta estimate	Wright CAPM return on equity based on 10.1 market return	Wright CAPM return on equity based on 12.6 market return
0.4	5.6	6.6
0.8	8.6	10.6

Source: AER analysis.

Notes: Based on a final risk free rate estimate of 2.64 per cent.

620 AER, *Second Concurrent Evidence Session*, 5 April 2018, p. 69, 72.

621 AER, *Explanatory statement: Rate of return guideline (appendices), December 2013*, pp. 26–27.

622 See section 0 for details on the Wright CAPM.

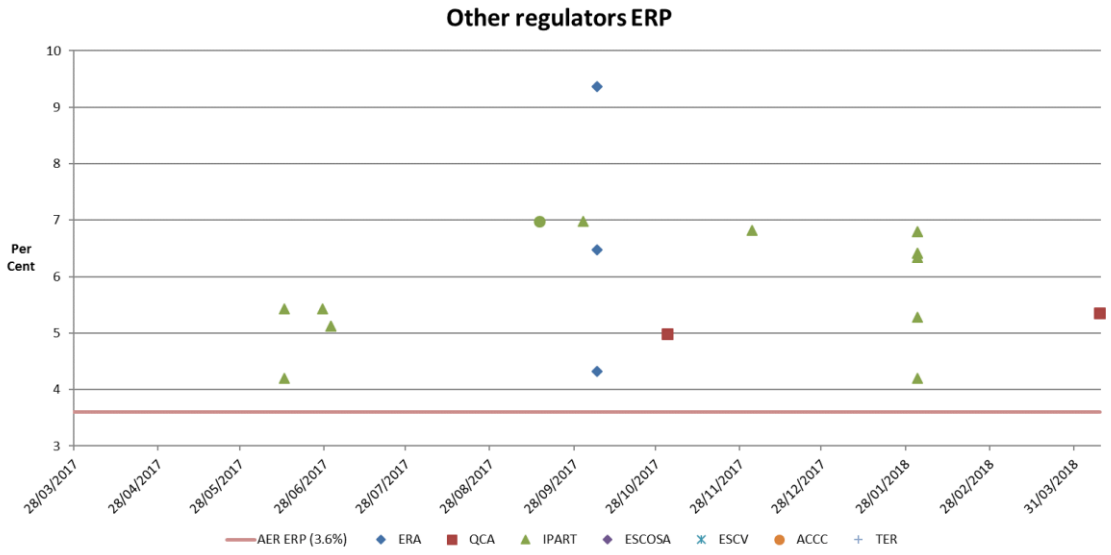
623 Our risk free rate estimate is 2.64 per cent.

624 Our estimated range for equity beta is 0.4 to 0.8.

5.4.2.2 Other regulators return on equity estimates

Figure 11 shows our estimate of the equity risk premium of 3.6 per cent is below those from other regulators. However, we note that, with the exception of the ERA, other Australian regulators do not set revenue determinations for regulated distribution and transmission energy network services.

Figure 11 Equity risk premium estimates from other regulators' decisions



Source: AER analysis of other Australian regulators since 2017

5.4.2.3 Brokers return on equity estimates

The table below shows the estimates of return on equity and premium above the risk free rate contained in the broker reports dated from March 2017 to May 2018.

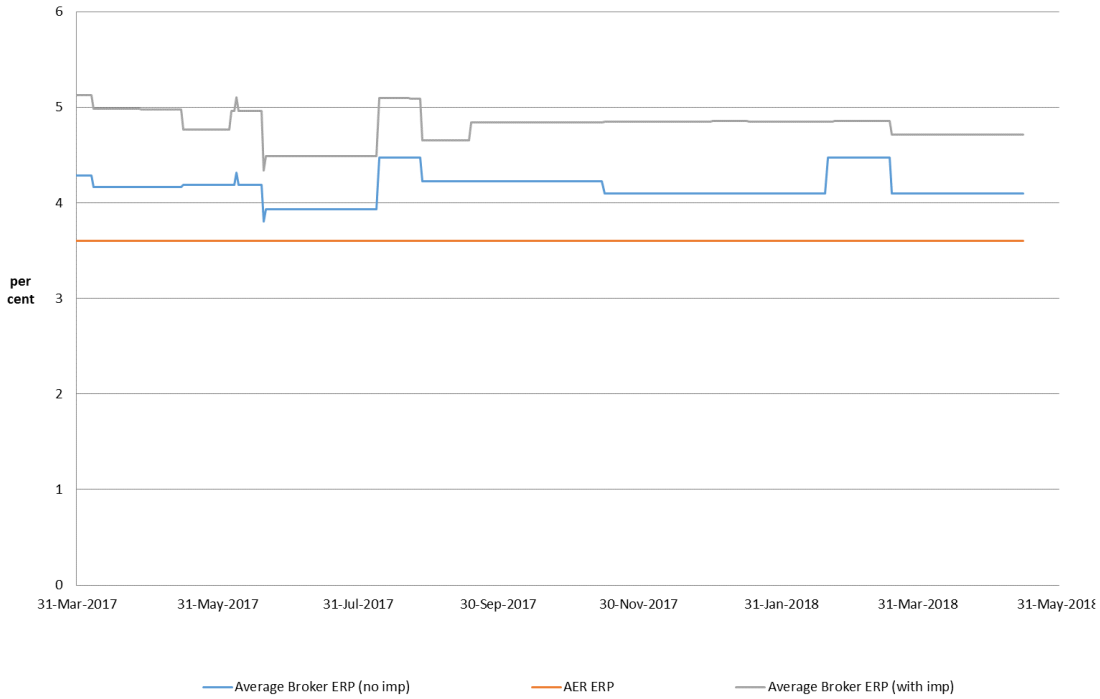
Table 22 Recent broker reports (per cent)

		Return on equity	Equity risk premium
Broker estimate—no imputation adjustment	Minimum	6.2	3.5
Broker estimate—no imputation adjustment	Maximum	8.4	5.0
Broker estimate—adjusted for imputation	Minimum	6.7	4.1
Broker estimate—adjusted for imputation	Maximum	9.0	4.9

Source: AER analysis of broker reports, dated 30 March 2017 to May 2018 that include a valuation for AusNet Services, Spark Infrastructure, APA Group, and/or DUET Group.

We observe from the table above that the equity risk premium from the AER's foundation model of 3.6 per cent is at the lower end of the range of the average premiums estimated by brokers. Directionally, as shown in Figure 12 below, the broker equity risk premium has remained within similar range for the duration of 2017 and 2018 although there has been a slight downward movement since the end of 2017. Our equity risk premium estimate is below the bottom of the unadjusted range.

Figure 12 Equity risk premium estimates from broker reports

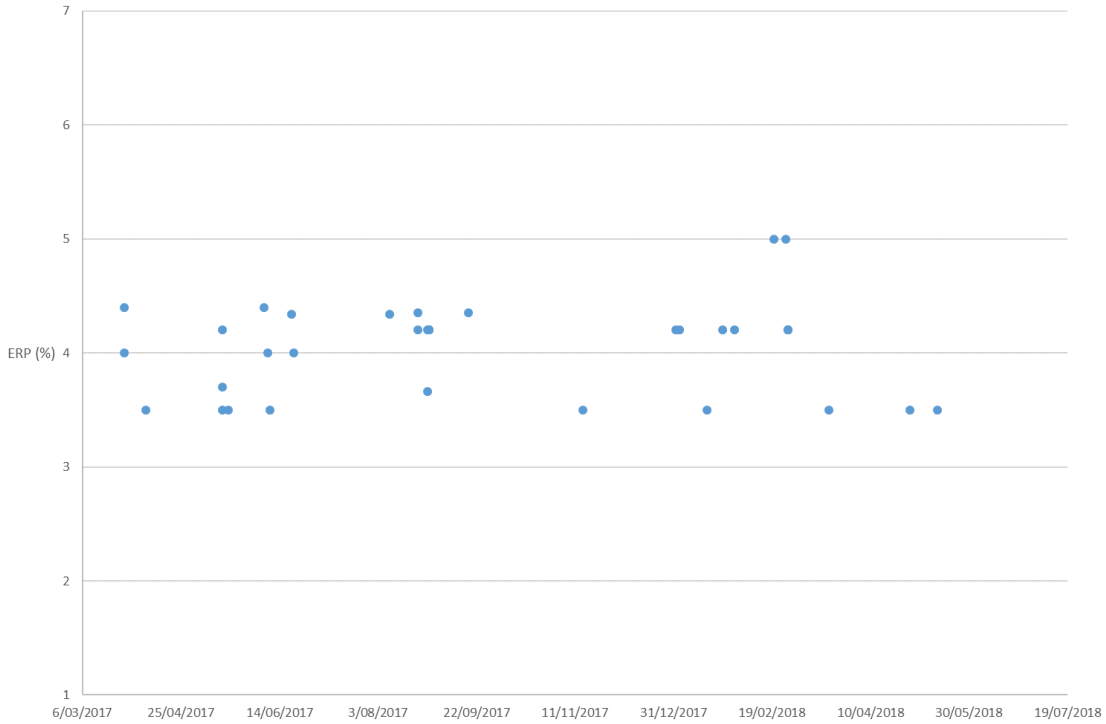


Source: AER analysis of broker reports that include a valuation for AusNet Services, Spark Infrastructure, APA Group, and/or DUET Group.

Notes: Average broker ERP is the mean of estimates from all brokers and for all businesses available at the time

Figure 13 shows the equity risk premium in broker reports since 2017. We note that they cluster between 3.5–4.2 per cent which is consistent with our value of 3.6 per cent.

Figure 13 Clustering of equity risk premium estimates from broker reports

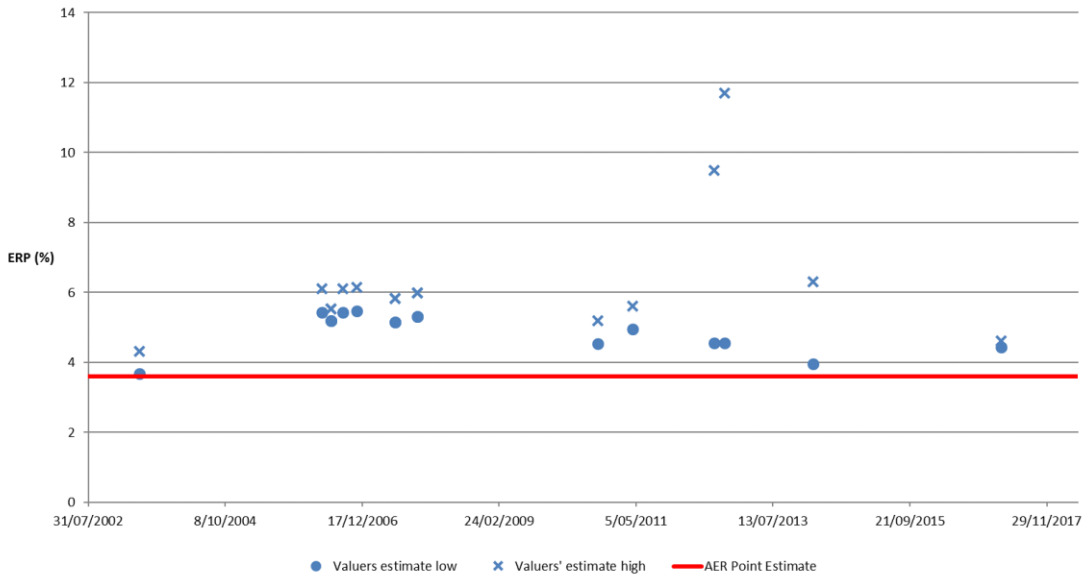


Source: AER analysis of broker reports that include a valuation for AusNet Services, Spark Infrastructure, APA Group, and/or DUET Group.

5.4.2.4 Takeover and valuation reports

The figure below outlines the range of return on equity and equity risk premium estimates from relevant independent valuation reports. The most recent report for a regulated energy business is KPMG's report for DUET released on 7 March 2017. This report implies an equity risk premium of 4.44 to 4.62 per cent (without adjustment for dividend imputation).

Figure 14 Equity risk premium from relevant valuation reports over time



Source: AER analysis of reports from Thomson Reuters

Notes: We have shown the equity risk premium based on a nominal vanilla WACC, expert reports using a different WACC 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.

We have considered information from independent valuation reports. There have been only 19 relevant independent valuation reports spanning a period going back to 1991.[625] Only 13 reports included a discounted cash flow analysis with information on a return on equity estimate. These 13 reports were provided by only four independent valuation firms, with 9 of the 13 reports being provided by Grant Samuel & Associates.

As a result, we consider that the number of reports is too low and the concentration of reports among only a few valuers is too high to be able to place significant reliance on the evidence from valuation reports.

We also note that the ranges for return on equity and equity risk premium estimates contained in Figure 14 include the final values used in the independent valuation reports and reflect any uplifts applied. However, as noted in previous decisions we have concerns about the applicability of these uplifts to the legislative objectives.[626] These uplifts may reflect a range of factors that do not warrant inclusion/consideration in the rate of return (for example, non-systematic risks, term structure of the chosen equity proxies, the relevant investment period exceeding the term of the proxies).

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625 Our search found reports going back to 1991, but contains no reports between 1991 and 1998 for comparable electricity or gas network businesses.

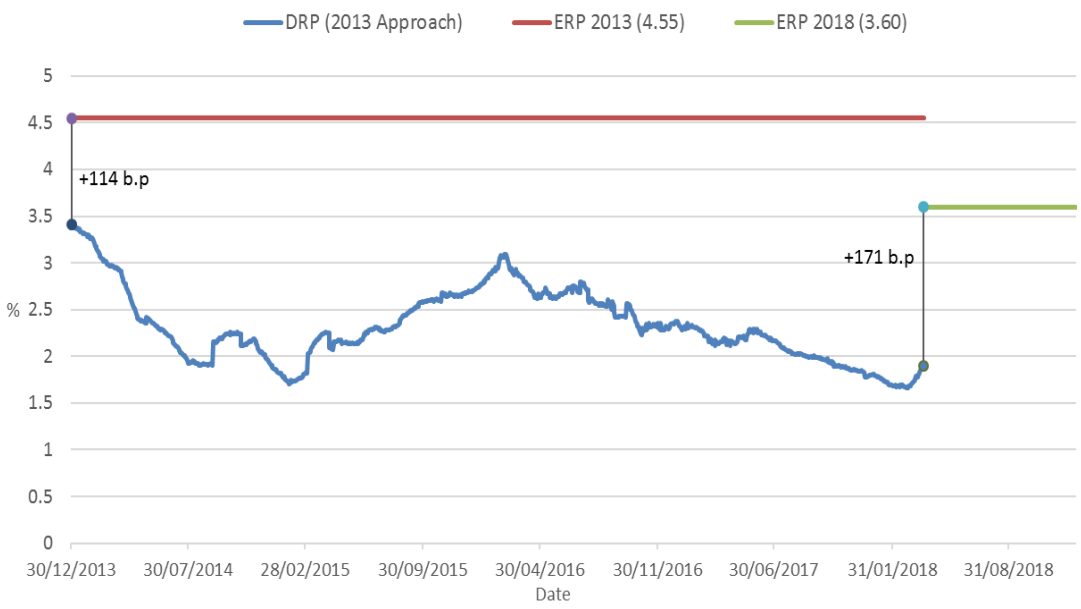
626 For example, see: AER, Draft decision Multinet Gas Access Arrangement 2018–2022 Attachment 3–Rate of return, July 2017, p. 102. Available at: https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/multinet-gas-access-arrangement-2018-22/draft-decision

We also have concerns that the adjustment for dividend imputation may not be appropriate as it is not clear the extent to which these estimates may be based on third party estimates that already account for the value of imputation credits.[627] Given the absence of sufficient information to support any precise adjustment, the risk premium appropriately reflecting dividend imputation is likely somewhere between the adjusted and unadjusted premiums, but we are unable to distil a precise estimate due to a lack of transparency in valuation reports.

5.4.2.5 Comparison with return on debt

We consider the debt risk premium (DRP) to be a valuable relative indicator of the reasonableness of our ERP. [628] Both provide an indication of the relative risk faced by investors. The advantage of the DRP is that it is easier to observe. Figure 15 shows the comparative and relative positions of the equity and debt risk premia.[629]

Figure 15 Comparison of ERP to DRP



Source: AER analysis, Bloomberg (BVAL) and RBA data.

Note: data updated to 29/03/18.

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627 For example, see: AER, Draft decision Murraylink transmission determination 2018 to 2023 Attachment 3–Rate of return, September 2017, p. 94. Available at: https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/murraylink-determination-2018-23/draft-decision

628 The spread between BBB+ rated corporate debt and the risk free rate. The DRP is calculated using the 2013 Guidelines' approach to estimate the return on debt (and DRP) as a simple average of BBB bond yields from RBA and Bloomberg BVAL data.

629 At December 2013, the ERP estimated in the 2013 Guidelines was 4.55 per cent, which was 1.14 per cent higher than the prevailing DRP at the time of 3.41 per cent. At 29 March 2018, the 2013 ERP of 4.55 per cent is now 2.66 per cent higher than the prevailing DRP of 189 per cent. Our ERP for this decision of 3.6 per cent is 1.71 per cent above this DRP.

The DRP is around 1.9 per cent as at the end of March 2018. When we finalised our 2013 Guidelines the debt risk premium was about 3.4 per cent. Comparatively, our 2013 Guidelines ERP estimate was 4.55 per cent, resulting in equity investors expecting to receive a premium of approximately 1.1 per cent above debt investors. Our ERP for this decision is 3.60 per cent which results in the expected return on equity having a premium of about 1.7 per cent above expected return on debt.

Thus, even though our ERP is lower in this decision compared to our 2013 Guidelines it represents a greater margin above the cost of debt.[630]

5.4.2.6 Evaluation of information

Our evaluation of the other information in section 5.4.2 leads us to consider that on the whole we do not need to revisit our estimate of an equity risk premium of 3.6 per cent.

We recognise the equity risk premium ranges from the Wright approach, valuers' and other regulators' decisions are above the ERP we have estimated. By contrast, our ERP for this decision represents an increase in comparison to the DRP. Once their strengths and weaknesses of the available cross checks are considered, we do not see a case for making further adjustment to the result calculated using the SLCAPM.

We also note stakeholders' disagreement on the usefulness of other information 'cross checks' and the concern that any adjustments based on other information could undermine transparency and rigour of process.

5.4.3 Step 6 – select point estimate

We are satisfied that an expected return on equity:

- derived from our foundation model approach and calculated via the SLCAPM,
- using a market risk premium of 6.0 per cent,
- using an equity beta of 0.6, and
- a risk free rate observed at the time the Guideline is applied,
- will contribute to the achievement of the 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

[630] We are currently adjusting our approach for estimating the return on debt. In the 2013 Guidelines and subsequent determinations we used a simple average of BBB-rated Bloomberg BVAL and RBA yield curves. Following further considerations in this decision, the return on debt is now based on a weighted average of BBB and A-rated Bloomberg BVAL, RBA and Thomson Reuters yield curves. If the new debt methodology is applied consistent across this comparison, the margin between the 2018 ERP and DRP would be higher compared to the 2013 debt approach.

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.

6 Risk free rate

In our section 5, we stated our decision to use the SLCAPM to calculate the allowed return on equity. The risk free rate is one of three parameters that contribute to the SLCAPM's formation of the return on equity. In the SLCAPM, the risk free rate measures the expected return from a riskless asset.

Our current approach to estimating a forward looking risk free rate uses the yield on Commonwealth Government Securities (CGS) with a 10 year term averaged over 20 consecutive business days as close as practicably possible to the commencement of the regulatory control period. [631]

6.1 Draft Decision

Our decision is to continue to estimate the risk free rate through the application of a formula for calculating the yield to maturity on 10 year CGS yields , based on data available over an averaging period nominated by service providers. Our decision is to refine the criteria that averaging periods should satisfy, based on review of submissions made to us and to accommodate the possibility of these guidelines becoming a binding rate of return instrument. Our decision is that service providers should have the ability to nominate an averaging period start and end date that meets the following requirements:

- Starts no earlier than 7 months prior to the commencement of the regulatory period in the case of electricity determinations, or the revision commencement date in the case of gas access arrangements, as specified in the current access arrangement.
- Ends no later than 3 months prior to the commencement of the regulatory period in the case of electricity determinations, or the revision commencement date in the case of gas access arrangements, as specified in the current access arrangement.
- Has between 20 and 60 consecutive business days in the period between the nominated start and end date, at the time the proposal is received by the AER.
- Is nominated prior to the start of the averaging period and contained in the initial proposal.

Where a service provider has failed to nominate an averaging period in accordance with the criteria above (or choses not to nominate one), we will use a period of 20 consecutive business days ending 3 months prior to the commencement of the regulatory control period or revision commencement date.

6.1.1 Approach to date

631 AER, *Explanatory Statement - Rate of Return Guideline*, December 2013, p.15

The 2013 Rate of Return Guideline[632] with supporting explanatory statements[633] and appendices[634] detailed the methodology for calculating the risk free rate over the past five years, and recent regulatory decisions confirm our position where challenged.[635] The methodology was to use an average of CGS yields taken over a 20 business day period, nominated by the service provider in advance of the period.

6.2 Input during the Guideline review process

We released an issues paper in October 2017 inviting input on the appropriate risk free rate methodology.[636] We summarised and considered submissions on the issue paper in our discussion paper.[637] A group of experts considered the averaging period in their statement of agreed positions prior to the concurrent evidence sessions.[638] Stakeholders made further submissions on the Guideline before 4 May 2018.

We have summarised the key points made by stakeholders and experts in Appendix A.

6.3 Issues and the AER's considerations

We identified the averaging period length, automatic application of the risk free rate and the term of CGS yields used to estimate the risk free rate as the key issues to consider in this review. We outline our consideration of these issues in sections 6.3.1, 6.3.2 and 6.3.3.

6.3.1 Averaging period length

We outline the different factors that informed our draft decision on the averaging period length in this section.

Relevance to the on the day risk free rate

We apply the SLCAPM pragmatically, considering the theoretically ideal methodology and allowing departures where it provides a sufficient practical benefit. Ideally the SLCAPM uses values that represent market conditions as close as possible to the commencement of the regulatory control period or the revision commencement date, this would be the on the day CGS yields for the risk free rate.[639] However, we have not

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632 AER, *Rate of Return Guideline*, December 2013

633 AER, *Explanatory Statement - Rate of Return Guideline*, December 2013

634 AER, *Explanatory Statement* - Appendices - *Rate of Return Guideline*, December 2013

635 See for example AER, *APA VTS 2018 Access Arrangement Final Decision - Attachment 3*, 30 November 2017; AER, *AusNet Services 2017-22 Final Decision - Attachment 3*, 11 May 2017;

636 AER, Rate of return issues paper, 31 October 2017, p. 18-19

637 AER, MRP Risk Free Rate Averaging Period and Automatic Application Discussion paper, March 2018, p. 38-39

638 AER, Concurrent Evidence Session 2 – Facilitator's Note, 4 April 2018, p. 42

639 This ideal was established and maintained in Federal Court cases, (for example Federal Court of Australia, ActewAGL Distribution v The Australian Energy Regulator [2011] FCA 639, 8 June, 2011, paragraph 119), the 2013 Guidelines, and a report by Dr Martin Lally (Lally, Risk free rate and the present value principle, August 2012, p.7).

used an on the day rate CGS yield as a proxy for the risk free rate in our 2013 or 2009 guidelines.[640] We decided not to use the on the day rate, because there was a benefit in using a longer averaging period.

We do carefully consider whether departures from the SLCAPM ideal are sufficiently justified by a benefit. We conveyed the benefit for a 20 day averaging period in our 2013 Guidelines, as reduced exposure to volatility[641] and intentional distortions[642] of the CGS yields. However, we did not accept an averaging period of 8 months in a later regulatory determination, as it was more than necessary to overcome the shortcomings of a 20 day averaging period.[643]

Exposure to risk free rate fluctuations

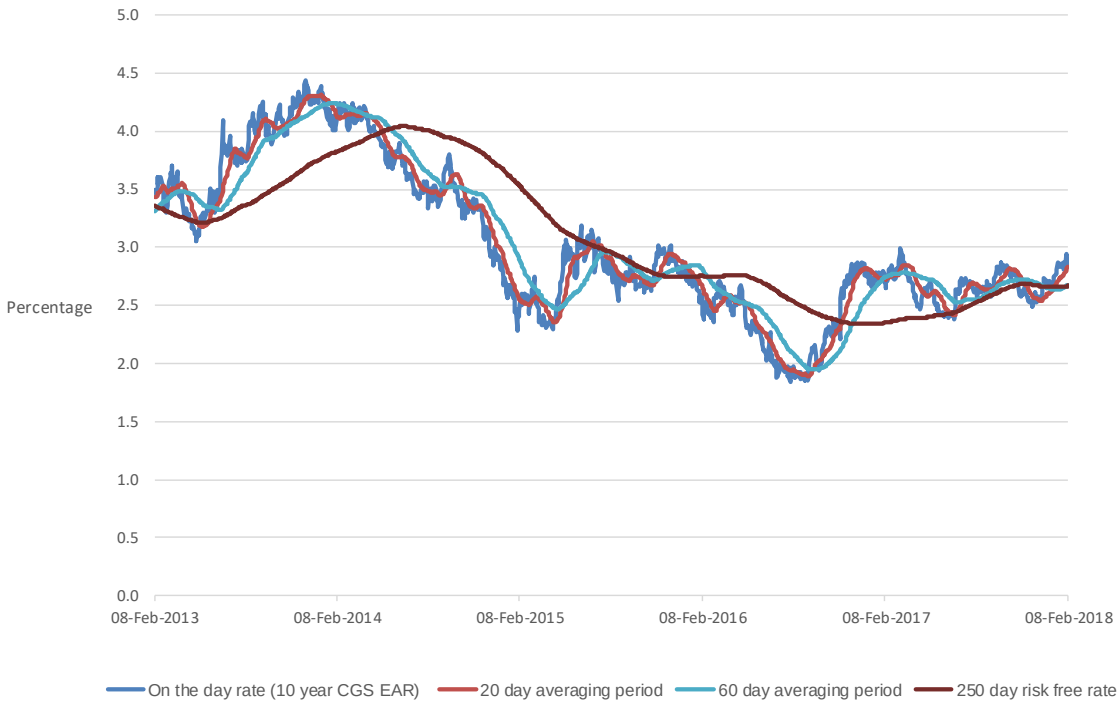
Stakeholder input in the review of the Guidelines identified a potential benefit in allowing a service provider greater flexibility in how it mitigates its exposure to fluctuations in the on the day rate.[644] This included agreement between networks[645] and consumers[646] that an averaging period of between 20 and 60 business days would provide this flexibility. Other stakeholders[647] and the concurrent evidence session experts also supported the change. [648] We consider that based on stakeholder input to the guideline review process, there is support from diverse stakeholders to use a longer averaging period.

Comparison of different averaging period lengths

Figure 16 shows the impact of different averaging period lengths on volatility in the on the day rate.

640 AER, Review of the WACC parameters, May 2009, p.132
641 AER, Explanatory statement - rate of return guideline, December 2013, pg. 77
642 Lally, *Risk free rate and present value*, August 2012, p. 7
643 AER draft decision – AusNet Services gas access arrangement 2018-2022 – Attachment 3, July 2017, pg 69-71
644 See Table 23.
645 ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.4
646 CRG, *ROR submission final*, 04 May 2018, p.39
647 See Table 23.
648 AER, *Evidence session 1& 2 Expert Joint Report*, 21 April 2018, page 64

Figure 16 Impact of different lengths of averaging CGS yields



Source: RBA interest rate statistics f16, AER analysis

The 20 day averaging period reduces the impact of individual days in the on the day rate. It does not however remove short-term fluctuations in the on the day rate. The 60 day averaging period in comparison 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.

6.3.2 Automatic application of the risk free rate

This guideline applies automatically, removing the need for us to exercise discretion by codifying the process for nominating the risk free rate.

Averaging period nomination window

We will need to specify the window within which the service provider can nominate the averaging period. We cannot have an averaging period end any later than three months prior to the regulatory control period commencement and revision commencement dates, to give us sufficient time to come to a final decision.[649] We are

[649] Our final decisions for determinations and access arrangement are generally produced at least 2 months prior to the commencement of their regulatory control period or revision commencement date. Please see AER, 7 year regulatory determination calendar 2015-2022, February 2018 for more guidance on reset timeframes

prepared to allow an averaging period that starts up to seven months prior to the commencement of the regulatory control period, to allow service providers a range of dates they can nominate for a 60 day averaging period to provide confidentiality of the nominated averaging period.[650] As such, we require that a nominated averaging period must start and end between 7 months and 3 months prior to the commencement of the regulatory control period of revision commencement date.

If the final decision is delayed

We have considered how delays in the final 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[651] or revision commencement date. [652] Therefore, the nominated averaging period would remain appropriate and we would not require a revised nomination.

Nominated averaging periods that don't 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 that is 20 days in length ending three months prior to 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.

Situations where the number of business days change

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 need 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.

6.3.3 Term of CGS yields

The term of the CGS yields informs which series of yields should be used in approximating the risk free rate.

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650 We have tried to protect confidentiality of averaging period where possible, see for example, AER preliminary decision Powercor distribution determination - Attachment 3 - Rate of return, October 2015

651 See for example, AER final decision Powercor distribution determination - Attachment 3 - Rate of return, October 2015

652 See for example, AER, Draft Decision Roma to Brisbane Gas Pipeline Access Arrangement - Overview, p.60

Appropriate term

We require that the return on equity parameters have a consistent investment horizon to ensure they are estimating a reasonable rate of return. We used a 10 year term for CGS yields in our 2013 Guidelines[653], as it was consistent with the term used for the return on equity parameters[654], including MRP. [655] Consumers submitted that a shorter CGS yield term of five years was appropriate for the risk free rate. They made this recommendation based on the following points:[656]

- The return on equity is set for a 5 year period (i.e. over the course of the regulatory period) and the risk free rate should reflect this,
- The equity beta and the market risk premium in the CAPM comes from an index of share price volatility measured over shorter periods but averaged over a longer period.
- Investors reassess their portfolios on a much shorter basis than 10 years.

We consider the consumer suggestion is advocating for using a different term for the risk free rate of five years instead of ten. This change would require the term for estimating all parameters of the return on equity to be revised to five years. The consumer submission did not provide sufficient justification or support for changing the SLCAPM parameters term from 10 to 5 years.

[653] AER, Explanatory statement, rate of return guideline, December 2013, pg. 79
[654] AER, Explanatory statement, rate of return guideline, December 2013, p.48
[655] AER, Explanatory statement, rate of return guideline, December 2013, p. 81
[656] See Table 23.

6.4 Summary of submissions

This section details the submissions we have received from stakeholders as part of our review process to date, and notes how we have had regard to each submission.

Table 23 Summary of submissions on the risk free rate

Key Point	Submission	Stakeholder	AER response
Methodology	The methodology should be prescribed by the AER in the guideline.	EUAA[657] MEU[658] Network Shareholder Group[659]	We agree that the methodology should be prescribed by us in the guideline rather than specifying the rate.
Averaging period length	The risk free rate averaging period should be extended up to 60 consecutive business days - to increase stability of the risk free rate.	CKI[660] Jemena[661] Victorian electricity distributors[662] APGA[663] CRG[664] ENA[665][666] Concurrent evidence session agreed position[667] ATCO[668]	We see there is overwhelming support for a move from 20 to 60 days in the length of the averaging period. Given that there is little opportunity for gaming, we are comfortable with moving from 20 to 60 consecutive business days.
	There should be no changes in the setting of averaging periods as this creates unnecessary inflexibility	APA[669] Network Shareholder Group[670] Network Shareholder Group[671]	We see that allowing an averaging period between 20 and 60 consecutive business days will allow service providers flexibility in how they mitigate their exposure to volatility in the risk free rate
	The current averaging period approach is	CCP[672] Ergon Energy and Energex [673]	We agree that an averaging period of 20 days is appropriate.

657 EUAA, Submission on the rate of return issues paper, 12 December 2017, pg. 8
658 MEU, Submission on the rate of return issues paper, 12 December 2017, pg.15
659 Network Shareholder Group, *Submission on Rate of Return Guideline Review*, 04 May 2018, pp. 13
660 CKI, Submission on the rate of return issues paper, 12 December 2017, pg.4
661 Jemena, Submission on the rate of return issues paper, 12 December 2017, pg. 3
662 Victortian Distributors, Submission on the rate of return issues paper, 12 December 2017, pg. 1
663 APGA, *Submission on Rate of Return Guideline Review*, 04 May 2018, pp.3
664 CRG, *Submission on Rate of Return Guideline Review*, 04 May 2018, p.39
665 ENA, Submission on the rate of return issues paper, 12 December 2017, pg. 18
666 ENA, *Submission on Rate of Return Guideline Review*, 04 May 2018, pp.4
667 AER, *Evidence session 1& 2 Expert Joint Report*, 21 April 2018, page 64
668 ATCO Australia, Submission on the rate of return issues paper, 12 December 2017, pg.5
669 APA, Submission on the rate of return issues paper, 12 December 2017, pg. 6
670 Network Shareholder Group, Submission on the rate of return issues paper, 12 December 2017, pg. 8
671 Network Shareholder Group, *Submission on Rate of Return Guideline Review*, 04 May 2018, pp. 14
672 CCP, Submission on the rate of return issues paper, 12 December 2017, pg. 38
673 Ergon Energy, Submission on the rate of return issues paper, 12 December 2017, pg. 4

	satisfactory		
	There is scope to review the length of the averaging period	APGA[674]	We agree that the averaging period length should be reviewed
Service providers allowed to nominate the averaging period	The service provider should have discretion as to which averaging period they would like to use	ATCO[675]	We agree with this position as it gives service providers an opportunity to mitigate fluctuations in the risk free rate.
	Service providers should not be allowed to choose the averaging period	MEU[676] Jemena[677]	We see little benefit in preventing service providers from nominating a period. Service providers have to nominate the period in advance, which reduces the possibility of bias.
Appropriate CGS term	The appropriate CGS term is 5 years as opposed to 10	CRG[678]	We disagree, the WACC we are using is to estimate an appropriate rate of return over a 10 year period.

674 APGA, Submission on the rate of return issues paper, 12 December 2017, pg. 6
675 ATCO Australia, Submission on the rate of return issues paper, 12 December 2017, pg.5
676 MEU, Submission on the rate of return issues paper, 12 December 2017, pg.15
677 Jemena, Submission on the rate of return issues paper, 12 December 2017, pg. 3
678 CRG, *Submission on Rate of Return Guideline Review*, 04 May 2018, p.44

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 or the 'average firm' in the market. Systematic risk is that which 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

As we use an Australian domestic SLCAPM, the relevant MRP is the expected Australian dollar return on the Australian market portfolio less the return on Australian dollar risk free asset.

Our regulatory task is to determine an overall rate of return (or WACC) for a Benchmark efficient entity that is commensurate with its efficient financing costs. To achieve this, our estimate of MRP used in the SLCAPM should be a good estimate of the expected Australian domestic MRP.

The expected MRP is not directly observable, although realised excess equity returns can be observed after the fact. These can then be used as information to assist with estimating the MRP.

In addition to past observed market returns you can use other information to inform your estimate of the MRP. This includes estimates from dividend growth models and from observed risk premiums on other assets such as debt.

7.1 Draft decision

Our draft decision is to set an MRP of 6.0 per cent 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 from the review, including evidence from historical excess return data and potential methods of forward estimation of the MRP.

Our estimate of 6.0 per cent per annum is a decrease from the MRP of 6.5 per cent per annum (also over 10 year CGS) estimated during the 2013 Guidelines process and subsequent regulatory determinations.

- We consider the evidence before us continues to support the overall approach used for estimating the MRP in the 2013 Guidelines process. That is, in estimating the MRP we have given the most weight to historical excess returns and less weight to other relevant evidence. The key reasons for continuing to give most weight to historical excess returns are:
    - These are directly observable, easily replicable and transparent
    - We expect required risk premiums to change relatively slowly through time.

When exercising our regulatory judgement, we rank the utility of different types of evidence at that time and then we qualitatively consider whether our initial estimate of

the MRP should be moved up or down.[679] In the 2013 review process, we stated that 6.0 per cent is an appropriate estimate of the historical excess returns (HER) evidence and the starting point for our determination of a point estimate.[680] We, then moved our estimate up based on the direction of the other evidence we consider in estimating the MRP, particularly having regard to dividend growth models (DGMs) evidence.

In this review, we continue to give greater wieght to HER for informing the market risk premium. This material, along with other relevant evidence, support a value of 6 per cent.

The key reason for a decrease in the MRP from 6.5 to 6 percent per annum is, in this 2018 review process, evidence from DGMs has not persuaded us to move the point estimate derived from HER. While we have considered a range of results that DGMs, as submitted through the consultation process, we have diminished confidence in the estimates from DGMs. We have received considerable expert advice since the 2013 Guidelines raising significant concerns with MRP estimates from DGMs.[681] The DGM evidence does not give us sufficient confidence to move the HER estimate.

We consider a decrease in MRP to 6 per cent per annum is also consistent with decreased volatility in equity markets since 2013 and material reductions in debt risk premiums over the past 5 years.

We note that moving the MRP to 6 per cent per annum is consistent with the MRP used by the AER immediately prior to the 2013 Guidelines review.

In this review we have updated the data and also considered any new evidence before us. We have then in determining an MRP of 6 per cent exercised our regulatory judgment based on the updated information. Continuing our existing approach to determining the MRP was broadly supported in submissions and in the expert sessions. However, there were different views on the merits of the different pieces of evidence and the values that should be derived from each.

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679 ENA, *Regulatory discretion and market risk premium determination*, 26 June 2018.We acknowledge receipt of a late submission from the ENA on 26 June 2018 which has not been subject to a full assessment. The submission included 3 options for exercising regulatory discretion and our initial assessment is as follows. The first option involves assigning specific numerical weights to each relevant piece of evidence. Our experience suggests that this level of precision is not possible. The second option is to set out a ranking of weights to each piece of evidence in terms of relative weight in achieving the final MRP. This option appears to be largely similar to our current approach to exercising regulatory discretion. The third option which recommends setting a 'neutral' long run estimate (for MRP or Total Market Return) as the default and then qualitatively making adjustments, based on a pre-set movement up/down relative to strength of the evidence. Our initial view is that this option would unnecessarily restrict future exercise of regulatory judgment because of 'default' settings becoming a hurdle/onus of persuasion.

680 AER, *Explanatory statement - Rate of Return Guideline*, December 2013, p. 97.

681 Partington and Satchell, *Report to the AER: Allowed rate of return 2018 Guideline review*, 21 May 2018, p.33; Partington and Satchell, *Report to the AER: Cost of Equity Issues 2016 Electricity and Gas Determinations* , April 2016, pp.27-33; McKenzie & Partington, *Report to the AER: Part A, Return on Equity, October 2014*, pp.26-41.

The service providers and the Network Shareholder Group (NSG) stated that more weight should be given to estimates from DGMs and from the Wright Approach. They also submitted less or no weight should be given to geometric averages of historical excess returns. For example, the ENA submitted:

> The Dividend Growth Model (DGM) provides useful evidence on the current MRP and should be given explicit and material weight by the AER.[682]
>
> ENA reiterates the view … that the geometric averages is inappropriate for the purpose of estimating the expected excess return … the geometric average should not be used and only the arithmetic average should be used for the purpose of setting an allowed rate of return.[683]

Consumer groups submitted that in estimating the MRP more weight should be given to geometric averages of historical excess returns and no weight should be given to estimates from DGMs and the Wright Approach. For example, CCP 16 stated:

> Whilst recognising that the DGM has a 'solid theoretical basis' and has value in certain circumstances CCP16 remains concerned about the reliance of the DGM in the context of an ex-ante regulatory decision.[684]

CCP 16 also stated in relation to the weight to put on geometric average excess returns:

> The AER has not placed adequate reliance on the outputs of the geometric average nor critically assessed the problems in the arithmetic average given the volatility of the annual Australian equity market returns of 17.7% that Dimson, Marsh and Staunton (2015) report. [685]

We have considered the different views put to us by stakeholders and experts in arriving at our draft decision. These considerations are set out in section 7.3.

The observed arithmetic MRP since 1988 of 6 per cent, combined with current (relatively low volatility) market conditions and some evidence of a decreasing MRP through time, supports our view that an MRP of 6 per cent per annum will give investors an opportunity to recover their efficient costs and contribute to achieving the NEO/NGO, revenue and pricing principles and the allowed rate of return objective.

7.2 Stakeholder consultation and submission

We released an issues paper in October 2017 outlining key areas of the Guideline review process. In response, stakeholders made submissions summarised in our MRP

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682 ENA, *Response to Discussion papers and concurrent expert evidence sessions*, May 2018, p.10.

683 ENA, *Response to Discussion papers and concurrent expert evidence sessions*, May 2018, pp.161-162.

684 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, p.89.

685 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, p.88.

discussion paper.[686] They are discussed as part of our considerations of issues in section 7.3.

7.2.1 Discussion paper and concurrent expert evidence sessions

We released an MRP discussion paper in March 2018 to provide background on likely MRP estimation issues we expected to be discussed at a concurrent evidence session on 5 April 2018. [687] The MRP discussion paper also contained questions to frame the discussions.

A statement of agreed positions was published following the concurrent evidence session.[688] We have reviewed this and the transcript and found the following positions to be accepted by the majority of experts:

Table 24 Agreed positions on MRP from concurrent evidence sessions

Agreed Position	Reasons for agreement
3 methods of market return estimation will be considered	Historic Excess Returns (HER), Dividend Growth Models (DGM) and market surveys are the most commonly used methods of estimation and there are currently no others which have been rigorously tested enough to be considered suitable for the regulatory task. It was also noted that surveys can also include valuation and broker reports as well as decisions of other regulators.
The DGM is a useful source of evidence	The DGM is considered a useful source of evidence by almost all market practitioners, however there are stark differences in opinion when it comes to how it is best used.

The statement of agreed position contained a reference indicating a particular 'NERA' adjustment should be used when estimating historical excess returns. This is not included in the table above because we consider this was subject to some disagreement. Not all experts were (fully) available over the course of preparing the expert joint report to present their views. The author of the joint statement also confirmed agreed positions may have been taken if no one objected rather than by requiring positive agreement and that assessing the views was not a quantitative voting exercise.[689]

686 AER, Discussion paper, *MRP, risk free rate averaging period and automatic application of the rate of return*, March 2018.

687 AER, Discussion paper, *MRP, risk free rate averaging period and automatic application of the rate of return*, March 2018.

688 AER, *Evidence session 1& 2 Expert Joint Report*, 21 April 2018.

689 See CEPA, *AER RORG Expert Joint Report*, 21 April 2018, p. 11: "It should be noted that not all experts were present in all the sessions and may therefore not have given views on all issues. The issues on which experts contributed were set out above in Section 1.1. Graham Partington (GP) was unavailable due to overseas commitments from 14 April 2018 and provided limited input from that date, but did have sight of the final draft. David Johnstone provided input on drafts until 10 April 2018.

We have also received submissions on the expert concurrent evidence sessions. The submissions and our considerations of these are contained in the next section. A full summary of submissions is provided in the section 7.4.

7.3 Issues and the AER's considerations

We have received divergent submissions on a range of issues from stakeholders as part of this review. In forming a view on our approach, we have taken into account these submissions and further consideration of the relevant evidence. Our consideration of our approach, issues and submissions are in the sections below under the following sections:

- Overall approach
- Historical excess returns
- Dividend growth model
- Survey evidence
- Conditioning variables
- Other regulators
- Wright approach

7.3.1 Overall approach to estimating the MRP

Our approach for estimating the market risk premium was published in our 2013 Guidelines as part of the foundational model approach for estimating the return on equity. We consider a wide range of relevant evidence and estimation methods for informing estimates of the MRP based on their strengths, weaknesses and suitability for our regulatory task which we distilled to the following:

- Historical returns - we gave Historical Excess Returns (HER) estimation the first priority in our MRP estimation, as the method is transparent, replicable and widely used across Australia.[690]
- Dividend Growth Models (DGM) - We gave our own construction of the DGM some directional weight in MRP estimation process in 2013, but evidence from our own construction of the DGM did not persuade us that the point estimate derived from HER should be moved in this 2018 review. Overall, we have not been persuaded to rely upon other DGM evidence that has been submitted to us during the review process to move the point estimate derived from HER. The DGM method has forward looking properties, but it is highly sensitive to assumptions.[691]

"The report indicates when most experts held a particular view. However, assessing the views was not a quantitative voting exercise, but a way of identifying alternative views and the reasons for them. Dissenting views of any expert were considered to be of value and may inform the views of the AER."

690 AER, *Explanatory statement - Rate of Return Guideline*, December 2013, p. 90.

691 AER, *Explanatory statement - Rate of Return Guideline* , December 2013, p. 90.

- Survey Evidence - Survey results use the direct theoretical link between expected excess returns and stated expectations, but vary in usefulness dependent on the design, timeliness and representativeness of the respondents.[692]
- Conditioning Variables - These were selected variables such as dividend yields, credit spreads and implied volatility which we determined had properties which revealed information about current market conditions. However, there is an indirect link between these indicators and the MRP. [693]
- Other Australian Regulators Decisions - We reviewed other regulator's decisions to inform ourselves of practices employed elsewhere in Australia. However, there is potential for this approach to be circular. [694]

7.3.1.1 Inverse relationship between MRP and risk free rate

Having considered the evidence before us, we remain of the view that, while the MRP may vary over time, there is no estimable inverse relationship between the MRP and risk free rate.

The view that MRP varies over time is generally accepted by all stakeholders. However there is uncertainty whether there is an inverse relationship between the risk free rate and MRP. This was evident by the comments in the second evidence session by multiple experts including Graham Partington, Ilan Sadeh, Simon Wheatley and Jim Hancock and Stephen Gray.[695] For example, Stephen Gray supported the view that MRP and the risk free rate had a negative relationship, noting that as government bond yields decreased, the required return on equity will decrease, but not one-for-one.[696] Ilan Sadeh was less supportive of this relationship, highlighting that the MRP has been fairly constant for the last two decades, and that the market views it as an accepted outcome.[697]

We have previously stated and continue to hold the view that the evidence for an inverse relationship between the MRP and the risk free rate is weak.[698] We consider there is neither strong theoretical reasons, nor strong empirical evidence, to support an ongoing and consistent inverse relationship. There are also a number of academic reports which suggest there may actually be a positive relationship between the risk free rate and the MRP at times.[699]

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692 AER, *Explanatory statement - Rate of Return Guideline* , December 2013, p. 90.

693 AER, *Explanatory statement - Rate of Return Guideline* , December 2013, p. 91.

694 AER, *Explanatory statement - Rate of Return Guideline* , December 2013, p. 91.

695 AER, Concurrent Evidence Session 2 – Proofed Transcript, April 2018, p. 69-71.

696 AER, Concurrent Evidence Session 2 – Proofed Transcript, April 2018, p. 69.

697 AER, Concurrent Evidence Session 2 – Proofed Transcript, April 2018, p. 70, 75.

698 For example, see: AER. Multinet draft decision, July 2017, p. 104; AER, Final decision SA Power Networks determination 2015–16 to 2019–20 Attachment 3–Rate of return, October 2015, p. 410–423, AER*, Final Decision AusNet distribution determination - Attachment 3 - rate of return*, May 2016, p. 82; AER, *APA VTS Final Decision: Attachment 3 - Rate of Return,* November 2017, p.299.

699 Li, *Time-varying risk aversion and asset prices*, Journal of Banking and Finance, 2007; Kim & Lee, *Stock returns, asymmetric volatility, risk aversion and business cycle: Some new evidence*, July 2007,; Damodoran, *Equity Risk*

During the concurrent evidence sessions there was discussion about the 'ends of the argument', one being a stable MRP and the other being a stable return on equity. This was presented as the bounds between which the true MRP exists.[700] Stakeholders submitted various views on whether a fixed MRP contributes towards our regulatory objectives. The CCP 16 supported fixing the MRP, highlighting the view that MRP should be the slowest WACC parameter to change.[701] Energy Networks Australia submitted that fixing MRP has produced volatility in the allowed return on equity that varies one for one with changes in the risk free rate.[702] Similarly, Evoenergy viewed that fixing MRP may result in equity estimates inconsistent with market evidence.[703]

The expert joint report appeared to indicate agreement that the MRP is neither constant nor directly inversely related to the risk free rate.[704] However, most experts at our concurrent evidence session considered there was no proper model to quantify the relationship.[705] We agree that there is no proper model and therefore there is no robustly estimable relationship between the MRP and risk free rate. The proposition for an upper bound is essentially a view that that the Wright approach should be given consideration in estimating the MRP. We discuss the Wright approach in section 0. More importantly, we consider that an approach which promotes a stable return on equity may not be suitable for a regulatory model which resets every 5 years.[706]

Reports have previously been submitted to the AER using debt yields, and their relationship with the yield on the risk free asset. These have been used to support the position that there is more stability in the overall yield on debt than either the yield on risk free asset or than the debt risk premium. This has then been used to support the argument the return on equity is likely to be more stable than the SLCAPM implies (if applied using a fixed MRP over a variable risk free return).[707] However extending the

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Premiums (ERP): Determinants, Estimation and Implications – the 2012 Edition; Rankin and Idil*, A century of Stock-Bond Correlations*, September 2014; Antti Ilmanen, *Expected Returns on Stocks and Bonds*, Journal of Portfolio Management, Winter 2003.

700 AER, Concurrent Evidence Session 2, 5 April 2018, pp.62-64.

701 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, p. 95.

702 Energy Networks Australia, Response to Issues Paper, December 2017, p.22, 24.

703 EvoEnergy, *Submission on Rate of Return Guideline Evidence Session*, 04 May 2018, p.4.

704 Joint Expert Report, *RORG review – Facilitation of concurrent evidence sessions, CEPA*, 21 April 2018, section 6.13, p.64.

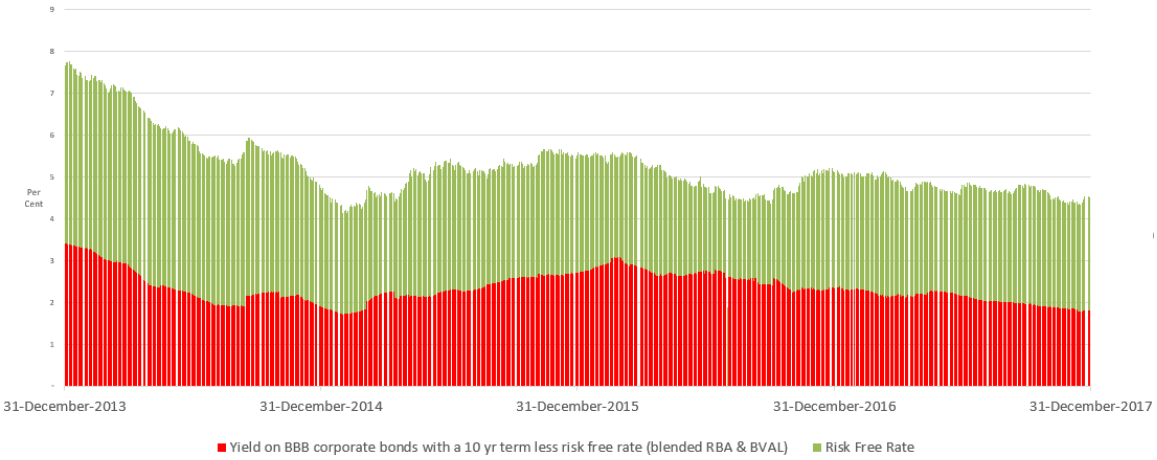
705 Joint Expert Report, RORG review – Facilitation of concurrent evidence sessions, CEPA, 21 April 2018, section 6.13, p.64.

706 Mr Sadeh also stated: "And a lot of investors recognise that as a feature of the current framework which is, you know, a fixed MRP over a bond rate that moves, and that is seen particularly for long-term investors, superannuation funds, they want their members to have exposure to Australian macro-economic variables. They see this as a resetting bond in that circumstance. So they understand that in absolute sense, even though they are investing their equity for a long time, 99 years, they accept that during different five-year periods they are going to get an absolute return that is a function of the bond rate, and that's priced into the way the investment works". See, AER, Concurrent Evidence Session 2 – Proofed Transcript, April 2018, p. 70, 75.

707 SFG, *Response to the QCA Discussion Paper on risk free rate and market risk premium*, 19 March 2013; HustonKemp, *The Cost of Equity, Response to the AER's Draft Decisions for the Victorian Electricity Distributors*, January 2016, p.44.

results in a similar study we have shown in Figure 17 that the yield to maturity on BBB debt has fallen since the 2013 Guidelines, along with both the DRP and the yield to maturity on the risk free asset.

Figure 17 Cost of BBB debt and its composition since 2013



Source: RBA extrapolated 10 year BBB debt yield average with BVAL 10 year BBB, RBA 10 year CGS yield.

McKenzie and Partington have also previously advised that any relationship between the MRP and risk free rate is an open question, and any relationship that may exist is not sufficiently well established to form the basis for regulatory adjustment to the MRP.[708] We have also received advice that a negative correlation between the risk free rate and the MRP has no well accepted theoretical support and is not used much in practice.[709]

Nevertheless, we accept there is evidence that some brokers and valuation experts effectively create a more stable overall return on equity by uplifting the risk free rate. HoustonKemp, in a 2016 paper, highlights this to suggest there is clear evidence that valuation firms accept an inverse relationship between the MRP and the risk free rate.[710] This is shown in Figure 18.[711]

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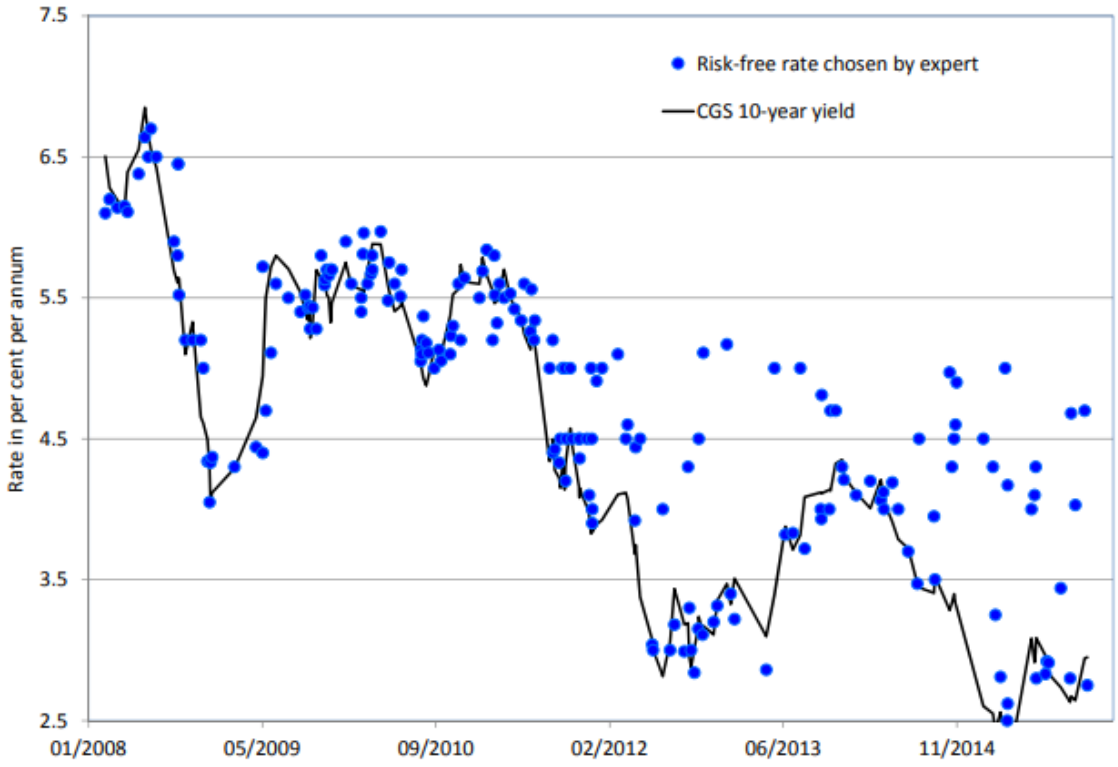
708 McKenzie and Partington, *Review of the AER's Overall Approach to the risk free rate and MRP*, February 2013, p28.

709 Partington and Satchell, *Cost of Equity issues 2016 Electricity and Gas Determinations,* April 2016, pp30-31; Partington and Satchell, Report to the AER, May 2018, pp34-35.

710 HustonKemp, *The Cost of Equity, Response to the AER's Draft Decisions for the Victorian Electricity Distributors*, January 2016.

711 HustonKemp, *The Cost of Equity, Response to the AER's Draft Decisions for the Victorian Electricity Distributors*, January 2016, p.44.

Figure 18 Plot of expert valuation reports' chosen RFR vs 10 year CGS yield



Source: HoustonKemp, *The Cost of Equity, Response to the AER's Draft Decisions for the Victorian Electricity Distributors*, January 2016, p.44.

Note: Data from Thompson Reuters, the ASX and the RBA. The 10-year CGS yields are interpolated from the RBA files f16.xls, f16hist.xls and f16hist2013.xls.

Having considered all material before us, we remain of the view that uplifts applied by brokers and valuers to initial estimates may be inconsistent with the allowed rate of return objective. We have also been advised that uplifting returns when applying the SLCAPM may not be suitable in a regulatory context as it is too ad-hoc.[712]

Uplifts may reflect non-systematic risks, or be designed to account for risks not addressed in cash flow forecasts, or (to the extent there is any) the expectation of outperformance of regulatory allowances. They may also reflect the relevant investment period exceeding the term of our regulatory control period. It is relevant that we are estimating a required return on capital to be applied in regulatory determinations applying for five years and which will be subsequently reset (including we expect for adjustment of the risk free rate) in the next regulatory control period.

[712] Partington and Satchell, *Report to the AER: Discussion of estimates of the return on equity,* 12 April 2017, p16.

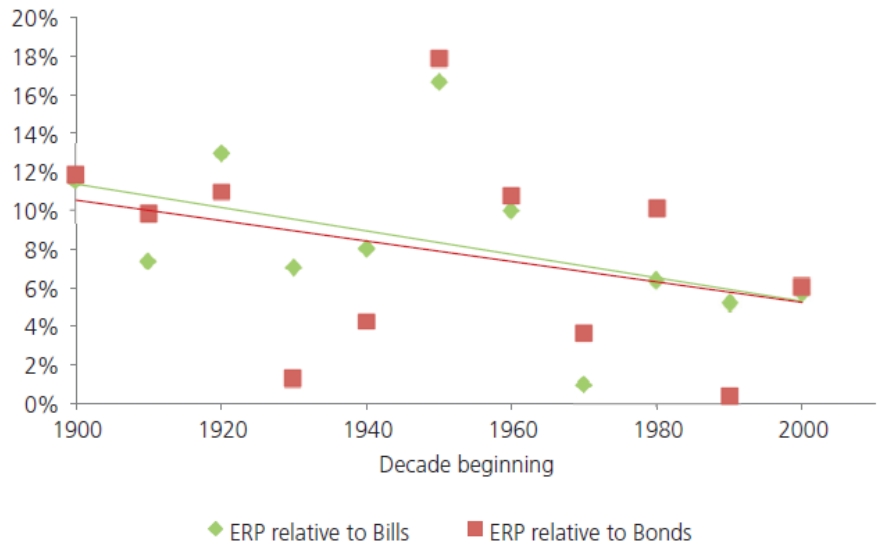
In terms of bounds on the MRP, we note that there is no reason (or evidence) to support movements in MRP being bounded to a relationship with the return on the risk free asset given the lack of an estimable relationship.

We accept that the true MRP may vary through time. For example the MRP may change in times of both changed risk and changed investor risk aversion. Quite distinct from risk aversion, the price of market risk may also change through time.

We note the MRP is the extra expected return investors require for investing in the full diversified 'market' portfolio. It can be thought of as the required (ex ante) compensation for bearing a unit of market risk. Because of the market wide nature of the MRP and its non-observable nature, it may change more slowly than other SLCAPM input parameters. This was acknowledged in the concurrent evidence session.[713]

There is some suggestion that over time, as investing in a global portfolio becomes easier and investors achieve greater diversification, the market risk premium falls. This was raised by the CRG in its submission on the discussion paper and the evidence sessions[714] and is also referred to in a report sponsored by Challenger Limited authored by Bianchi, Drew and Walk.[715] This is alongside evidence from Dimson, Marsh and Staunton (2015) that there is downward trend over time in the realised MRP. Figure 19 shows a graph of Dimson et al.'s trend of the achieved equity risk premium over time.

Figure 19 Trend in Equity Risk Premium in Australia



Source: Dimson, Marsh and Staunton (2015); Calculations from Bianchi, Drew & Walk, *The Unpredictable Equity Risk Premium*, November 2015.

[713] AER, Second Concurrent Evidence Session, 5 April 2018, p.65.

[714] CRG, *Submission to the AER rate of return guideline review,* 04 May 2018, p.53.

[715] Bianchi, Drew & Walk, *The Unpredictable Equity Risk Premium*, November 2015.

Whilst we must consider evidence as presented, acknowledging trends with solid theoretical foundations assists us in estimating a forward looking MRP.

7.3.2 Historical Excess Returns

We give most weight to historical excess returns in estimating the MRP. Consistent with the approach used in the 2013 Guidelines and updated evidence, we have set a range of 5.0 – 6.5 per cent from the historical excess returns data, with a point estimate of 6.0 per cent. In deriving our observed estimate of historical excess returns, we:

- use the unadjusted Brailsford, Handley, Maheswaran (BHM) data. This is because the data is from a reputable source (the ASX) and BHM investigated the underlying data and concluded that it was reasonable.
- consider both arithmetic and geometric averages over multiple time periods. We consider there are strengths and weaknesses to each method and Partington and Satchell have advised to continue to use both.

Annual historical excess returns are estimated by measuring realised annual excess market returns (above the annualised return on the risk free asset). These annual excess returns on the market are then averaged over varying time periods to give different estimates of a forward looking MRP. In doing this we acknowledge the expected MRP may differ to the realised MRP and may change through time.

Historical excess returns have been our main source of information used for estimating the MRP since the 2013 Guidelines. The method is easily replicable, transparent and widely used in both regulation and by market practitioners. We intend to continue to use historical estimates of realised excess returns on the market as our primary basis for MRP estimation.

In relying on the historical excess returns we have given relatively less weight to estimates using data before 1958. This is due to concerns with data reliability given the age of the data. There is also a debate around how to adjust the pre 1957 data for biases it contains and whether to use the NERA adjustment of BHM adjustment.

There were a number of points raised in submissions both to our 2017 Issues Paper as well as the March 2018 discussion paper and the concurrent evidence session.[716] These are covered below.

7.3.2.1 NERA adjustment vs BHM use of the ASX adjustment

There are potential problems with the realised Australian market (All Ordinaries) return data series before 1962. The issue relates to the fact that the underlying yield series on the Australian market over the periods from 1882 to 1955 and 1956 to 1961 were

[716] AER, Transcript of Second Concurrent Evidence Session, 5 April 2018, p52.

constructed retrospectively by Lamberton and the Sydney Stock Exchange.[717] These series reflect a simple unweighted average yield on dividend paying stocks only. The unweighted yields are biased towards smaller high yielding stocks and excluding non-dividend paying stocks also overstates the realised yields.

The Australian Stock Exchange (ASX) subsequently made an adjustment to the Lamberton/Sydney Stock Exchange return series to correct for these biases. In doing so the ASX reduced the yields by 25 per cent in the early years of the accumulation index where it did not have any other dividend yields to guide it.[718]

Brailsford, Handley and Maheswaran confirmed the ASX applied an adjustment factor of 0.75 for the period 1882 to 1964 and that the adjustment appeared reasonable. Based on their assessment, they determined to use this ASX constructed yield series for the pre 1974 period for estimating the excess return on the market over this period.[719] A full explanation of this is contained in the academic paper by Brailsford, Handley and Maheswaran.[720]

Some submissions and the concurrent evidence session stated that we should be using a return series adjusted by NERA Economic Consulting (NERA) instead of the earlier return series in the paper by Brailsford, Handley and Maheswaran that reflects the ASX adjustment.[721] The expert report from the concurrent evidence session also stated that experts suggested we should use the NERA adjustment moving forward. However they did not give reasons to support to this position. Having reviewed the report, we do not consider that the use of the NERA adjustment was agreed by all experts.[722][723]

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717 From July 1961, the series was calculated by the SSE on a monthly basis. (see Brailsford, Handley, Maheswaran, 'Re-examination of the historical equity risk premium in Australia', Accounting and Finance, Vol. 48, 2008, p. 79). See AER, Final decision SA Power Networks determination 2015–16 to 2019–20 Attachment 3–Rate of return, October 2015, p. 375.

718 Email correspondence from the ASX to Brailsford et al. dated 26 May 2004, reported in Brailsford, Handley, Maheswaran, 'Re-examination of the historical equity risk premium in Australia', Accounting and Finance, Vol. 48, 2008, p. 80; See AER, Final decision SA Power Networks determination 2015–16 to 2019–20 Attachment 3–Rate of return, October 2015, p. 375.

719 Brailsford, Handley, Maheswaran, 'Re-examination of the historical equity risk premium in Australia', *Accounting and Finance*, Vol. 48, 2008, p. 81.

720 Brailsford, Handley, Maheswaran, 'Re-examination of the historical equity risk premium in Australia', *Accounting and Finance*, Vol. 48, 2008

721 Brailsford, Handley and Maheswaran, Re-examination of the historical equity risk premium in Australia, Accounting and Finance, vol. 48, 2008, pp. 85–86.

722 CEPA, *AER RORG Expert Joint Report*, 21 April 2018, p.59

723 See CEPA, *AER RORG Expert Joint Report*, 21 April 2018, p. 11: "It should be noted that not all experts were present in all the sessions and may therefore not have given views on all issues. The issues on which experts contributed were set out above in Section 1.1. Graham Partington (GP) was unavailable due to overseas commitments from 14 April 2018 and provided limited input from that date, but did have sight of the final draft. David Johnstone provided input on drafts until 10 April 2018.
The report indicates when most experts held a particular view. However, assessing the views was not a quantitative voting exercise, but a way of identifying alternative views and the reasons for them. Dissenting views of any expert were considered to be of value and may inform the views of the AER."

During the development of the 2013 Guidelines the ENA engaged NERA. NERA proposed an alternative adjustment to the Lamberton/Sydney Stock Exchange data set.[724]

We have considered the use of the NERA yield series at length in prior AER regulatory determinations.[725] Following the expert session we have considered this issue again.

We chose to use the BHM data that contains the ASX adjustment in the 2013 Guidelines and continue to consider this is the appropriate data to use. The reasons we continue to hold this view are:[726]

- BHM investigated and confirmed that the adjustment applied by the ASX to address the upward bias in dividend yields for 1882 to 1961 return data was reasonable
- The ASX has provided and adjusted the data.
- Adjustments such as those previously proposed by NERA have not been adequately justified by NERA and do not lead to a material improvement in the quality of data. For example, John Handley stated that 'it is unreasonable to draw a conclusion about three-hundred data points from a sample of only seven of those data points. Second and more fundamentally, NERA has not reconciled their data back to the Lamberton data as illustrated below'.[727]
- NERA's estimates contain adjustments that do not lead to complete reconciliation with the Lamberton data and did not establish that there was a downward bias in the BHM data set.

As such, we consider that our historical return analysis should be based on the updated BHM data set containing the ASX adjustment, consistent with the approach in our 2013 Guidelines.[728] In line with this view in this decision we use updated BHM data.

7.3.2.2 Arithmetic vs Geometric Averages

The debate between using arithmetic averages and geometric averages has been a common feature of submissions to us over recent years and in submissions during this guideline review process.

CCP 16 contends that the AER has not placed adequate reliance on the outputs of the geometric average nor critically assessed the problems in the arithmetic average given the volatility of the annual Australian equity market returns of 17.7 per cent that

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724 AER, Better regulation explanatory statement rate of return guideline (appendices), December 2013, p. 83; NERA Economic Consulting, The Market, Size and Value Premiums – A report for the Energy Networks Association, June 2013, p. 8 - 17).

725 See for example, AER, Ausgrid Final Determination, Attachment 3 - Rate of Return, April 2015, pp 321-326.

726 AER, *Final Decision TransGrid transmission determination 2015-2018*, 30 April 2015, pp.312-316.

727 Handley, *Further advice on the return on equity*, April 2015, p. 8.

728 AER, December 2013 Guidelines Explanatory Statement – Appendices,pp.83-84.

Dimson, Marsh and Staunton (2015) report.[729] The service providers and the Network Shareholder Group (NSG) stated less or no weight should be given to geometric averages of HER.

Currently we base our estimate primarily on arithmetic returns, and have regard to the highest value from our set of geometric averages when forming a 'floor' of a potential point estimate. We acknowledge the potential downward bias of the geometric returns in this method[730], but also take into account the extra information the geometric average returns when determining an estimate for the MRP.[731]

Some submissions state that we should not give any weight to the geometric return.[732] One of the reasons this is argued is because the geometric average return compounds returns over a number of years, whereas the AER is estimating a single year return on capital to use in the AER's post tax revenue model (PTRM). This was also discussed in the concurrent evidence session.[733]

There have also been submissions during the guideline review process which suggest the AER should not be giving the arithmetic average any preference over the geometric average in estimating the MRP.[734]

Partington and Satchell have also advised that it is appropriate for the AER to consider return periods of more than one year.[735] They noted that investors compound returns and whether or not the AER compounds returns is not relevant to the return that investors require. Given investor holding periods of more than one year they noted that it is appropriate for the AER to have regard to the geometric average. In the concurrent evidence session Satchell stated that he was disinclined to remove the use of either method entirely given the information available.[736] Blume and Jacquier et al also show that where the holding period is more than one year, then the arithmetic mean of one year returns is an upward biased measure.[737]

This topic was also the subject of previous consideration in the Australian Competition Tribunal which concluded it was appropriate to rely on both sets of estimates.[738]

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729 CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, May 2018, p.88.

730 AER, *APA VTS Final Decision: Attachment 3 - Rate of Return*, November 2017, p.76.

731 AER, *APA VTS Final Decision: Attachment 3 - Rate of Return*, November 2017, p.206.

732 For example, ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.79-80.

733 AER, *Concurrent evidence session 05 April 2018 transcript*, April 2018, pp.55-60.

734 For example, CRG, *ROR submission final*, 04 May 2018, pp.53-54.

735 Partington and Satchell, *Report to the AER: Allowed Rate of Return Guideline Review*, 21 May 2018, p. 34.

736 AER, *Concurrent evidence session 05 April 2018 transcript*, April 2018, p. 57

737 Blume ME, *Unbiased Estimators of Long-Run Expected Rates of Return*, Journal of the American Statistical Association, vol. 69, 1974, pp. 634–638; Jacquier E, Kane A, Marcus AJ, *Geometric or Arithmetic Mean: A Reconsideration*, Financial Analysts Journal, 59, pp.46- 53.

738 Australian Competition Tribunal, *Application by Envestra Ltd (No 2) [2012] ACompT4*, 11 January 2012, paragraph 157

On balance, we consider there is sufficiently robust evidence to continue to consider geometric averages. For this reason we have maintained our approach of giving most weight to arithmetic averages but using the geometric range to set the lower bound of the overall HER range.

7.3.2.3 Time Periods

In the expert statement from the concurrent evidence session there was a statement which suggested only periods of at least 50 years should be considered when using historical excess returns to estimate the MRP.[739] This would mean removing the 1980 and 1988 onwards periods from consideration.

Following the expert session we have considered this issue further.

Pink Lake Analytics, in a 2017 report to the ERA, raised issues about potential uncertainty with older data, as highlighted by the different possible adjustments, and suggested a simple solution would be to exclude the pre-1937 period.[740] It also suggested testing for structural breaks would be a more rigorous test of which periods were relevant.[741] It also acknowledged that the older time periods have lower standard errors and minimising this is desirable, but making decisions to exclude periods because of simple heuristics should be done with caution because they can be abused.[742]

We accept that standard errors are improved by using a longer data set. However, as financial conditions change through time, so do investors required risk premiums, we consider that estimates using more recent data are likely to be less biased. Therefore, we consider that we should continue to observe estimates from a range of time periods including more recent periods.

7.3.2.4 Time Horizon

A point raised in the submissions has been that the MRP should not be calculated using the geometric return because our one year return is not compounded within our modelling, and so should not use compounded return averages.[743] However there is debate over what time period the MRP should be estimated over.

We accept that the PTRM is a single year model, and calculates the allowed revenue based on yearly estimates. However the return on equity, and the MRP, is implicitly estimated over a 10 year forward looking holding period given our anchor for the SML is the yield to maturity on Commonwealth Government Bonds with term to maturity of 10 years.

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739 AER, *Concurrent evidence session 05 April 2018 transcript*, April 2018, p. 60

740 Pink Lake Analytics, *Estimation of the Market Risk Premium*, December 2017, p.9

741 Pink Lake Analytics, *Estimation of the Market Risk Premium*, December 2017, p.9

742 Pink Lake Analytics, *Estimation of the Market Risk Premium*, December 2017, p.8

743 ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.80-82

During the second concurrent evidence session, Hancock also stated that a single year arithmetic estimate, without any adjustment for previous return volatility, would not be sufficient. He therefore recommended looking at several time periods in order to arrive at a satisfactory MRP estimate.[744]

We have also been advised that it is appropriate for us to consider return periods of more than one year as investors holding periods are more than one year.[745]

In light of the discussions above we remain of the view it is appropriate to have regard to both arithmetic and geometric historical excess returns, over various time periods.

7.3.2.5 Updated Data

Table 25 displays data taken as single year historical excess returns over various time periods. From this we reach the arithmetic historical excess return range of 6 per cent to 6.5 per cent and the geometric excess return range of 4.2 per cent to 5.0 per cent. We were advised the final return period of 2000-2017 presented in the discussion paper is likely not large enough to be statistically reliable.[746] Therefore, we have not given it any consideration.

It is important to note that whilst more recent data is likely more represented of current market conditions and investor expectations, averages over longer sampling periods will have lower standard errors all else equal.

Whilst there is an increase in the arithmetic average between the period starting in the 1937 and the periods starting in 1958 and 1980, the geometric average remains fairly consistent. We recognise that the geometric average value is likely to be below that of a best forward looking annual risk premium estimate. However, the consistency in the geometric values from different time periods implies annual return volatility may have caused the observed arithmetic excess returns to have increased over the periods starting in 1958 and 1980. This is also supported by the second column in Table 25that shows the arithmetic annual return volatility over each period

Large differences between the arithmetic and geometric averages arise when there is high volatility in annual returns over the sampling period. As annual return volatility decreases over a sampling period, the gap between the arithmetic average annual return and the geometric average annual return decreases. Our discussion in 7.3.5 shows that we are in a time of relatively low volatility in relation to the long term average. Because of this, we might expect a forward looking estimate of the current MRP to be somewhere between the geometric and arithmetic historical returns. CRG submitted that we should set the MRP at 3.6 per cent by giving more weight to the geometric mean as measured for the period 1984–2017.[747] We have regard to the

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744 Hancock, AER second concurrent evidence session, 5 April 2018

745 Partington and Satchell, *Report to the AER: Allowed Rate of Return Guideline Review*, 21 May 2018, p. 34

746 AER, Concurrent Evidence Session 2, Proofed Transcript, p.60.

747 CRG, *Submission to the AER rate of return guideline review,* 04 May 2018, pp.57.

extra information the geometric average returns provide. However, we do not consider that they provide evidence of such significance to directly estimate the MRP based on a single historical period's geometric average.

Table 25 Historical excess returns (per cent)

Sampling period	Arithmetic average	Arithmetic return Standard Deviation	Arithmetic average (2013 guideline)	Geometric average	Geometric average (2013 guideline)
1883–2017	6.3	1.63	6.3	5.0	4.8
1937–2017	6.0	1.92	5.9	4.2	3.9
1958–2017	6.5	2.17	6.4	4.2	3.8
1980–2017	6.4	2.12	6.3	4.3	3.8
1988–2017	6.0	1.72	5.7	4.5	3.6

Source: Handley, An estimate of the historical equity risk premium for the period 1883 to 2011, April 2012, p. 6. AER update for 2012–2017 market data. The 2013 guideline values are taken from data up to December 2012.

Notes: Calculated using an assumed imputation value (or theta value) of 0.6.

In the 2013 Guidelines we estimated a range of possible MRP values of 5 to 6.5 percent based on arithmetic and geometric average annual returns. We then estimated a point estimate of 6.5 per cent.

Based on expert and stakeholder advice we acknowledge that the geometric average is downwardly biased, however it does provide information and should be considered in our range.

7.3.3 Dividend Growth Models

Dividend Growth Models (DGMs) can use analyst forecasts of current dividends combined with estimate of dividend growth and the current price to estimate an implied MRP. A basic constant growth dividend growth model is algebraically expressed as follows:

$$P = \frac{D_1}{(r - g)}$$

Where:

P is the share price

D1 is expected dividend in the next period

r is cost of equity

g is expected growth rate

In the 2013 Guidelines we used estimates from DGMs to inform our point estimate of the MRP, where the point estimate came from within a possible MRP range of 5 per cent to 6.5 per cent, which in turn was based on observed historical excess returns. Relatively high results from our DGM resulted in the MRP point estimate being at the top or our range and set at 6.5 per cent.

Having reviewed submissions, the expert evidence session and further analysis, our view is to not move the market risk premium estimate based on DGM. We acknowledge that this places less reliance on the DGM than the 2013 Guidelines. This is because since 2013 our concerns about biases of the model and the divergent results from alternative versions of the model have increased.

7.3.3.1 Use of the DGM

We note the DGM divides opinion across stakeholders and experts. A number of submissions stated that the DGM is the only method readily available to the AER which is forward looking.[748] It is considered forward looking because it relies on estimates of future growth rates, both in the long and short term. A number of submissions stated that the DGM should be given equal, or near equal, weight with the historical excess returns.[749] Other submissions have stated that because of issues regarding assumptions and biases we should place no substantial weight on MRP estimates from the DGM.[750]

We recognise we had concerns with the use of DGMs in 2013 as well, and note ENA's view that our concerns are not new and therefore we should not adjust our view.[751] However multiple submissions have stated these issues have become better highlighted since the 2013 Guidelines. Since 2013, we have also received advice about further issues with the DGM and its lack of suitability to reliably track changes in the MRP.[752] In light of this advice about concerns we consider valid, we consider DGM

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748 For Example, Ergon Energy and Energex, *Ergon Energy and Energex submission on AER Issues Paper*, 12 December 2017, p.6; Queensland Treasury Corporation, *QTC submission to the RoR Guideline Review Issues Paper*, December 2017, p.5.

749 APGA, *Submission on AER Review of ROR Guideline*, 04 May 2018, pp.12-13; EvoEnergy, *Submission on Rate of Return Guideline Evidence Session*, 04 May 2018, p.4; APA, *Submission on Rate of Return Review,* 04 May 2018, pp.28-32; ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.67-71; ATCO Gas Australia, *Response to Revie of Rate of Return Guideline – Issues Paper* , 12 December 2017, p.8; Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, p.4; Network Shareholder Group, *Submission on rate of return issues paper*, 12 December 2017, p.10; Queensland Treasury Corporation, *QTC submission to the RoR Guideline Review Issues Paper*, December 2017, p.5.

750 ECA, *Response to the AER Issues Paper*, December 2017, p.22; EUAA, AER Rate of Return Issues Paper October, December 2017, p.9; Major Energy Users, *Submission by the MEU to the review of the rate of return guideline*, 18 December 2017, p.16; CCP16, Submission to the AER Rate of Return Guideline Review concurrent evidence sessions, 4 May 2018, pp.109-111.

751 ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.67-71.

752 Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, 21 May 2018, p.33; Partington and Satchell, Report to the AER: Cost of Equity Issues 2016 Electricity and Gas Determinations , April 2016, pp.27-33; McKenzie & Partington, Report to the AER: Part A, Return on Equity, October 2014, pp.26-41.

based estimates of the MRP no longer sufficiently reliable to warrant increasing the MRP above 6 per cent per annum.

The major concern with the reliability of estimates from DGMs revolves around the challenge of forecasting the growth rates in dividends, particularly the terminal growth rate. This is discussed in detail below.

7.3.3.2 Model Selection

When referring to DGM evidence it is also important to note that there are multiple forms of DGM. Each of them use the inputs differently in order to estimate the market risk premium. There is no 'correct' dividend growth model and all DGMs seem likely to suffer from the same general limitations.

As DGMs come in different forms, there is an issue of which configuration is likely to lead to the best estimate of the MRP. For example, IPART use 5 separate DGMs in its estimation process as it considers this will lead to the best result.

In the 2013 guideline we arrived at a version of the DGM we believed was best suited to our regulatory task, and that is displayed below:

$$P_c = \frac{m \times E(D_c)}{(1+k)^{m/2}} + \sum_{t=1}^{N} \frac{E(D_t)}{(1+k)^{m+t-0.5}} + \frac{\frac{E(D_N)(1+g)}{k-g}}{(1+k)^{m+N-0.5}}$$

Where:

Pc is the current price of equity, for which we use the S&P/ASX 200 index as the proxy

E(Dc) is expected dividends per share for the current financial year[753]

E(Dt) is expected dividends per share for the financial year t years after the current financial year

m is the fraction of the current financial year remaining, expressed as a decimal point

N is the time period after which dividend growth reverts to its long-term rate (for the two stage model, N = 2, for the three stage model N = 9)

g is the expected long term growth rate in nominal dividends per share

k is the expected return on equity for the market portfolio

We see no reason to move away from this particular construction of the DGM we have used since the 2013 Guidelines. We have also had no issues raised with our specific

[753] We sourced dividend forecasts from Bloomberg. We have been informed by Bloomberg that its convention for reporting dividend forecasts on an index is to use calendar year forecasts as the relevant financial year forecasts.

model in submissions. As such all results quoted here, unless otherwise specified, are from the above model.

7.3.3.3 Long Term Dividend Growth Rate

As indicate by the algebra above, DGM estimates are highly influenced by the terminal, or long term, dividend growth rate.

In the 2013 Guidelines we estimated a central terminal growth rate of 4.6 per cent with high growth rate of 5.1 per cent and a low growth rate of 3.78 per cent.

Our central dividend growth rate of 4.6 per cent was estimated by Martin Lally based on an expected nominal GDP growth for Australia of 5.6 per cent and an equity leak of 1 per cent.[754] The upper bound was formed from the same advice, and the 3.78 per cent was from the advice of Partington and McKenzie.[755]

In his 2013 advice Partington suggested our growth rates may be too high given economic conditions.[756] We note economic conditions do not appear to have improved markedly since 2013.

We also noted in our March 2018 discussion paper that those models which use a variable growth rate based on the risk free rate now generate results that are substantially below our model, whereas before they were well within an accepted range.[757] Whilst growth rates based on GDP estimates may still be suitable, it is important to consider if they are still the best estimate of long term dividend growth for use in our DGM, and how reliable the different estimates might be.

Different sources give GDP growth estimates that are materially different and there is a significant margin of error in those estimates. [758] A research discussion paper by the RBA also indicates its own GDP forecasts may biased.[759] Previous advice from Partington also suggests that the GDP growth rate may not be a good measure of dividend growth.[760]

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754 Martin Lally, *The Dividend Growth Model*, March 2013, pp. 13-20.

755 Partington & McKenzie, *DGM Final report*, December 2013, p.4,15.

756 Partington & McKenzie, *DGM Final report*, December 2013, pp.4-15.

757 AER, *MRP Discussion Paper*, March 2018, pp.20-21.

758 RBA, May Statements on Macroeconomic Policy - Economics Outlook, May 2018 states growth will be above 3%; The IMF forecasts Australian growth will fall to 2.6% in 2023 http://www.imf.org/en/Countries/AUS; Economist Intelligence Unit puts long term growth between 2018 and 2030 as 2.2% and between 2018 and 2050 as 2.1%. http://country.eiu.com/article.aspx?articleid=156657399&Country=Australia&topic=Economy&subtopic=Long-term+outlook&subsubtopic=Summary; the OECD forecasts growth around 2.7% between now and 2060 https://data.oecd.org/gdp/gdp-long-term-forecast.htm;

759 Reserve Bank of Australian, Research discussion paper - Estimates of Uncertainty around the RBA's forecasts, Peter Tulip and Stephanie Wallace, Nov 2012.

760 Partington & McKenzie, *DGM Final report*, December 2013, p.13.

A report by Bianchi, Drew and Walk sponsored by Challenger Limited also stated that long term real dividend growth rates in Australia have been around 1 per cent.[761] An expected 1 per cent per annum real dividend growth rate implies an expected nominal dividend growth rate of around 3.5 per cent per annum if expected inflation is 2.5 per cent per annum.

In addition, Damodaran and Fenebris suggests, based on finance theory, that GDP Growth is materially similar to the risk free rate, and as such the current risk free rate holds as a suitable anchor for the long term dividend growth rate.[762] Damodaran suggests a suitable estimate for the long term dividend growth is simply the current risk free rate, whilst Fenebris considers and appropriate terminal dividend growth rate is the risk free rate less 2 per cent per annum.

It was noted in the submission from the ENA that Fenebris' growth rate can lead to results that seem implausible, and advice from Partington and Satchell agreed with that.[763] The advice from Partington and Satchell also stated that whilst the general trend of the CGS rates may follow the GDP growth it has the potential to be a poor predictor when the risk free rate is particularly high or low.[764]

We accept that there are a wide range of possible growth rates and that at times a growth rate based on the risk free rate may not produce suitable results, especially in times of extreme growth or high/low risk free rates. We also note the ERA stated in its recent decision that the 5.1 per cent growth rate may not be suitable in the current economic climate[765] .

Ultimately, there are numerous issues surrounding the estimation of dividend growth rates selection and there is a wide variety of potentially acceptable growth rates which could be used in the DGM. With the range of potential growth rates varying from as low as 1 per cent to as high as 5.5 per cent, the DGM based MRP estimate could vary by around 4 per cent purely due to the chosen growth rate.[766] Given this very large potential for error in the MRP estimate driven by growth rate selection, our decision must account for the potential error or unsuitability in the estimate. In this decision we have taken this into account by giving relatively lower weight to estimates of the MRP from dividend growth models.

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761 Bianchi, Drew & Walk, *The Unpredictable Equity Risk Premium*, November 2015, p.24.

762 Fenebris, Determination of a Market-Wide Implied Cost of Capital, May 2016; Damodoran, Closure in Valuation, http://people.stern.nyu.edu/adamodar/pdfiles/eqnotes/dcfstabl.pdf

763 ENA, *Submission to the AER Review of Rate of Return Guideline*, 4 May 2018, p74.

764 Partington & Satchell, *Final Report to the AER 2018*, 22 May 2018, pp.31-33.

765 ERA, *Draft Decision on Proposed Revisions to the Access Arrangement for the Western Power Network*, 2 May 2018, p.34.

766 Previous DGM results have shown a change in growth rate can have an almost one for one inverse impact on the MRP estimate.

7.3.3.4 Other issues raised with the DGM

Whilst no stakeholders consider the DGM is a model without issues, ENA has submitted that because there are no new issues with the model we should not adjust our view on the model's regulatory suitability.[767] However, multiple submissions have stated these issues have become better highlighted since the 2013 Guidelines, and diverging results shows their potential unsuitability for use in a regulatory setting.[768]

This section covers other issues raised with estimating the MRP using dividend growth models.

Analyst Forecasts

We have previously observed that analyst forecasts are upwardly biased.[769] We have received advice that this is a real and present issue for the DGM, and there has not been any counter argument to this except for some analysis on the ASX 20 submitted by Frontier in its 2016 report to the AER. Frontier claimed the analysis actually showed a downward bias in forecasts, however it was a single survey with a small sample and as such we previously gave the argument little weight as per expert advice.[770]

During the second concurrent evidence session, Partington raised a related point which he referred to as incurable optimism.[771] This references the point that in most applied examples of the DGM in use the short term dividend growth rate must decrease by a significant amount to reach the long term dividend growth rate. Partington's point states that at some point these short term dividend growth rates must be equal to long term rates, or at times be below them in order for the short term and long term growth rates to fulfil their purposes.

As analyst forecasts are an essential component of the DGM, having an upward bias of an unknown amount makes it hard for us to place much weight on the estimates from these models.

Inflation

The construction of dividend growth models regularly uses expected inflation to reach the nominal growth figure. This can lead to differing final growth rates depending on the estimate of expected inflation used. This was raised by Partington in the concurrent evidence session on 5 April 2018.[772] This represents a further issue with assumptions being made in order to arrive at a DGM based MRP estimate.

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767 ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.67-71.

768 CCP16, Submission to the AER Rate of Return Guideline Review concurrent evidence sessions, 4 May 2018, p. 115; CRG, S*ubmission to the AER rate of return guideline review,* 04 May 2018, p.56.

769 AER, APA VTS Final Decision, Novemebr 2017, p.217.

770 AER, APA VTS Final Decision, November 2017, pp.217-218.

771 Partington, *AER concurrent evidence Session*, 05 April 2018, p81.

772 Partington, *AER concurrent evidence Session*, 05 April 2018, p81.

Term Structure

Previous advice from Lally has stated that the DGM may produce upwardly biased results when the risk free rate is low due to the term structure of equity.[773] This point was raised within the concurrent evidence sessions as well.

We acknowledge that biases in our DGM may exist due to the term structure of equity and may vary over time due to movements in the risk free rate.

Sticky Dividends

A point that has been raised in previous decisions[774] and was highlighted in the second concurrent evidence session[775] is that firms display traits of altering their dividend payouts in ways that are not symmetrical. When markets encounter poor returns firms are less likely to lower their dividend payout ratio than they are to increase them during good times.

This can cause the DGM to have further upward bias, as dividends may remain artificially high for a period after conventional economic theory suggests the return on capital should have dropped. As such, MRP estimates from the DGM could well be upwardly biased at times due to this behaviour from firms.[776]

Frontier, in its 2018 report to the AER, submit that because the RBA data shows earnings forecasts have not fallen as much as expected in recent years that Sticky Dividend concerns should not be considered.[777] Whilst this concern may not be an issue at the current time, it remains a concern about the model more generally and highlights its dependency on forecasts and business practices.

Stable Return on Equity

We analysed the historical results from our construction of the DGM and found that there is as much as an 80 per cent negative correlation between the MRP estimates from the DGM and the risk free rate. This means the DGM implicitly (in its application) assumes a stable return on equity. This raises two concerns for us

Firstly, this is inconsistent with our view that there is a lack of support for an inverse relationship between the risk free rate and the MRP. This was discussed at length in the second concurrent evidence session, and is covered in more detail in 0.

Secondly, even if the DGM was reliable, it seems overly complicated to use a model like a DGM when the movements in the MRP could largely explained by movements in the risk free rate.

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773 Lally, *The Dividend Growth Model*, 4 March 2013, pp.5-9.

774 AER, *APA VTS Final Decision – Rate of Return*, November 2017, pp. 216-217,212.

775 Partington, *AER concurrent evidence Session*, 05 April 2018, p81.

776 Partington & Satchell, *Report to the AER, Return on equity (Updated)*, April 2015, p.49.

777 Frontier, *Rate of Return for Ausgrid 2018*, April 2018, pp.152-154.

Dividend Reinvestment

Due to the DGM's reliance on dividend payout forecasts, any scheme which alters the value of dividends paid out is important to take account of when considering its suitability for use by the AER. Partington highlighted in the second concurrent evidence session that some firms operate dividend re-investment plans.[778] As such firms that may advertise a 6 per cent dividend distribution may only have a true dividend yield of 4 per cent if there is a 30 or 40 per cent participation in these dividend re-investment plans. This is likely to lead to upward bias in the MRP estimation from the DGM.

7.3.3.5 Updated Data

Taking note of the results from various growth rates which can be applied to the DGM and the other models which are in regulatory use in Australia it is clear that there is a wide range of results for the MRP estimate which the DGM could support.

The table below shows MRP estimates using dividend growth rates from 3.78 per cent to 5.1 per cent, although we note the best estimate of the dividend growth rate may be lower than 3.78 per cent for the reasons discussed earlier

Table 26 Dividend Growth Model Results with Sensitivity Analysis

Sensitivity	Two stage model	Three stage model
Baseline 4.6 per cent long-term growth rate 2 month average to end April 2018 unadjusted analysts' forecasts	7.47	7.38
5.1 per cent long-term growth rate	7.94	7.77
3.78 per cent long-term growth rate	6.70	6.73
6 months to end April 2018	7.42	7.37
12 months to end April 2018	7.52	7.46
Analysts' forecast + 10 per cent	8.05	7.95
Analysts' forecast - 10 per cent	6.90	6.81
Combined - low	6.08	6.15
Combined - high	8.56	8.42

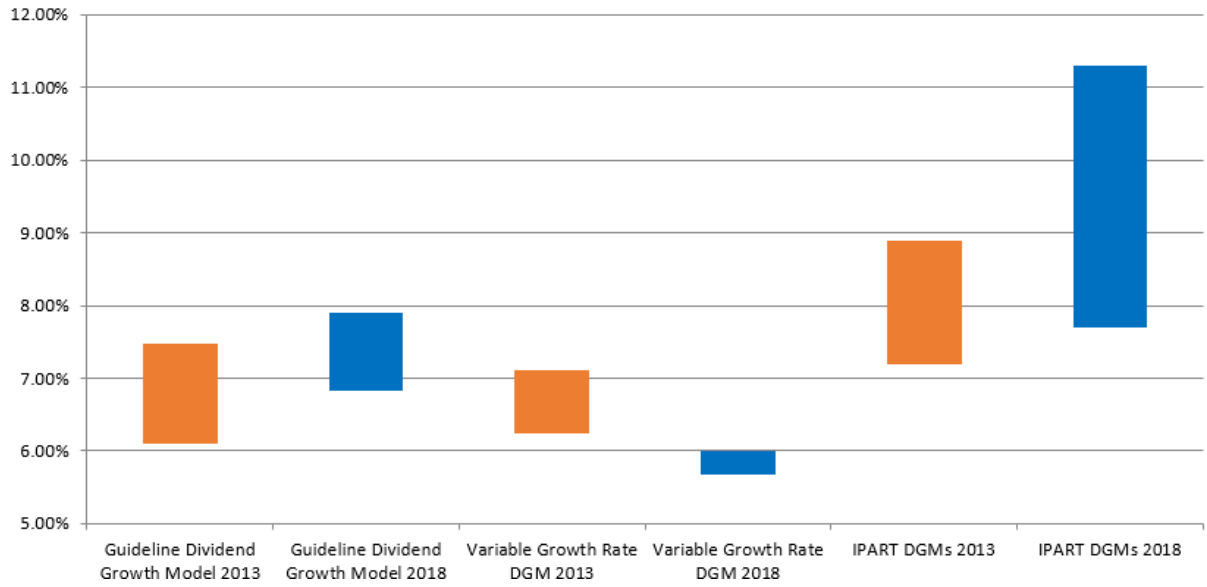
Source: Bloomberg, AER analysis.

Notes: All market risk premium estimates are based on an assumed theta of 0.6.
Combined - low is based on 3.78 per cent growth, 6 month averaging, analysts' forecasts - 10 per cent.
Combined - high is based on 5.1 per cent growth, 12 month averaging, analysts' forecasts + 10 per cent.

[778] Partington, *AER concurrent evidence Session*, 05 April 2018, p81.

As further illustration of the DGM's sensitivity to choice of inputs and wide range of results, Figure 20 displays results from different constructions and applications of the DGM produce. The variable growth rate model replaces the static growth rate of the AER's regular DGM with the monthly 10 year CGS yield. The IPART's DGMs are based on its approach discussed in section 7.3.6. The wide range of results also highlights how MRP estimates from the same DGM can diverge under different assumptions even using the same model.

Figure 20 Results from various DGM constructions from 2013-2018



Source: AER own analysis, Variable growth rate equal to 10 year CGS yield but model construction is otherwise identical to the AER's DGM model, IPART February update

7.3.4 Survey Evidence

We consider market surveys continue to support an MRP between 5.5 per cent and 6.5 per cent.

We note survey evidence comes from market practitioners who are asked what they expect the MRP to be in the Australian market. These surveys take on different forms and can vary in different ways, including questions asked, type of participants and number of participants. As such it is important to view each piece of evidence in the context it is presented.

In the approach to date we have used the survey evidence to inform our MRP estimate. It informs us about investors' and market practitioners' expectations and/or what they apply in practice

Submissions to this guideline process were split on the use of survey evidence, with some stakeholders supporting increasing the use of surveys, such as Energy Australia[779], whilst other stakeholders such as the APGA[780] opposed any use of surveys at all. Proponents argued they were direct results from market practitioners, but opponents countered saying that surveys are easily skewed and the headline data can be misleading.

In the concurrent evidence session there was disagreement as to how the surveys should be considered. Gray and Wheatley stated that there should be no consideration given to survey evidence whilst Partington stated that their forecasting ability is limited but they are a good measure of expectations across the market.[781]

We recognise that surveys have limitations and are not at a level of reliability as to give it weight as a direct estimation method of the MRP. However, we consider that it has some value and use it to inform us of investor expectations. There has not been any significant change in evidence regarding surveys which persuade us that we should change our 2013 Guidelines position on the role of survey data.

779 Energy Australia, *Submission to AER Rate of Return Evidence Sessions*, 04 May 2018, p.2.

780 APGA, *Submission on AER Review of ROR Guideline*, 04 May 2018, p.12.

781 Partington, Gray & Wheatley, *AER Concurrent Evidence Session*, 5 April 2018, pp.89-90.

Table 27 shows that since the 2013 Guidelines surveys have largely supported an MRP between 5.5 per cent and 6.5 per cent. We note that several factors play a part in the overall value of each survey such as, timing of survey, the sample, wording of the questions and response rate and non-response bias. In this context, we continue to recognise that triangulation across surveys can reduce the limitations associated with particular surveys.[782] Only the 2017 and 2018 Fernandez surveys[783] indicate that expectations are higher than our range. We do not consider that on its own these surveys move us to think that our range of 5.5 to 6.5 per cent is unreasonable or that we should choose a point estimate at the top of the range.[784]

[782] McKenzie and Partington, *Supplementary report on the MRP*, February 2012, pp.17-20.

[783] Frontier Economics acknowledges that KPMG 2017 survey's median MRP is 6.0 but suggest that more should be read into the KPMG website comments regarding valuers adjustments to the current risk free rate. See, Frontier, *Ausgrid's Rate of Return*, April 2018, pp126-128, section 18.5.1.

[784] It is worth noting that 2017 survey had markedly fewer responses than previous and subsequent surveys conducted by the same author. The subsequent survey (2018) appears to also indicate a downward movement relative to 2017.

Table 27 MRP Survey Results

Survey	Numbers of responses	Mean (per cent)	Median (per cent)	Mode (per cent)
Fernandez et al (2012)	73	5.9	6.0	N/A
KPMG (2013)a	19	N/A	6.0	6.0
Fernandez et al (2013)	17	6.8	5.8	N/A
Asher and Hickling (2013)	46	4.8	5.0	6.0
Fernandez et al (2014) b	93	5.9	6.0	N/A
Asher and Hickling (2014) c	27	4.4	4.6	6.0
Fernandez et al (2015)	40	6.0	5.1	N/A
KPMG (2015) d	~27	N/A	6.0	6.0
Asher and Carruther (2015)	29	4.9	N/A	N/A
Fernandez et al (2016)	87	6.0	6.0	N/A
Carruther (2016)	24	5.3	N/A	N/A
Fernandez et al (2017)	26	7.3	7.6	N/A
KPMG (2017)	45	N/A	6.0	6.0
Fernandez et al (2018)	74	6.6	7.1	N/A

Sources: Several survey reports.[785]

Notes: a) While this survey had 23 market participants, 19 specified what market risk premium they used.

b) The 2014 survey did not report the response rate. AER staff obtained this information from Professor Fernandez via email correspondence on 22 July 2014.

c) The response rate for this survey is lower than the response rate in previous Asher and Hickling surveys because the survey took place from 5 December 2014 to 14 December 2014, which was very close to Christmas. AER staff obtained the mode from Associate Professor Anthony Asher via email correspondence on 17 September 2015.

d) The KPMG (2015) survey had 29 market participants, but figure 24 indicates that not all the market participants gave a response for the market risk premium. However, visual inspection indicates that the response rate was approximately 27.

[785] Fernandez, Ortiz, Acín, Market risk premium used in 71 countries in 2016: a survey, May 2016; KPMG, Australian valuation practices survey 2015, May 2015; Fernandez, Ortiz, Acín, Discount rate (risk-free rate and market risk premium) used for 41 countries in 2015: a survey, April 2015; Asher and Hickling, Equity Risk Premium Survey 2014, Actuaries Institute, April 2015; Fernandez, Linares, Acín, Market Risk Premium used in 88 countries in 2014, IESE Business School, June 2014; Asher and Hickling, Equity Risk Premium Survey, Actuary Australia, December 2013; Fernandez, Arguirreamalloa and Linares, Market Risk Premium and Risk Free Rate used for 51 countries in 2013, IESE Business School, June 2013; KPMG, Valuation Practices Survey 2013, February 2013; Fernandez, Arguirreamalloa and Corres, Market Risk Premium used in 82 Countries in 2012, IESE Business School, January 2013; Asher and Carruther , *Equity Risk Premium Survey 2015, Actuaries Digital*, May 26 2016; David Carruthers, Equity Risk Premium Survey 2016, 8 March 2017; Fernandez, Linares, Acín, Discount Rate (Risk-Free Rate and Market Risk Premium) used for 41 Countries in 2017: a survey, April 2017; KPMG, *KPMG Valuation Practices Survey*, July 2017, Fernandez et al, Market Risk Premium used for 59 countries in 2018, April 4 2018.

7.3.5 Conditioning Variables

Having evaluated the evidence presented below in the context of their limitations, we consider that conditioning variables, on balance, do not support any adjustment to our estimate of MRP based on HER data.

Dividend yields do not provide a discernible trend relative to long term averages and therefore does not indicate any directional movement. However, credit spread data appears to be trending lower since 2015 but on its own is insufficient to move our estimate of MRP from 6.0 per cent.

The 2013 Guidelines set out three conditioning variables that we use to inform (or 'condition') our initial MRP estimate. These are implied volatility, dividend yields and credit spreads. We take these into account when estimating the MRP because they provide an indication of changes in market conditions.[786] We are cautious on how we use this evidence given their limitations but consider these are relevant and give them some consideration.

Frontier Economics submits that in the absence of formal econometric mapping to a point estimate of the MRP, it is unclear how to interpret the evidence. Therefore, Frontier Economics suggests that we should not be considering conditioning variables to estimate the MRP.[787] Frontier Economics' concerns appear to stem from its interpretation on how we use conditioning variables. In particular, it appears to consider that we give conditioning variables weight as evidence in their own right. We reiterate that, consistent with our 2013 Guidelines, we consider that conditioning variables do not provide reliable estimates on their own. [788] Rather, we use conditioning variables to inform our point estimate derived from HER. In this context, given we do not use conditioning variables to develop our initial point estimate, econometric mapping to a point estimate is not a pre-requisite.

We agree with CCP 16 that conditioning variables can provide useful evidence by showing investors' perceptions of risks, but we are aware of the limitations and cautious in using this evidence.[789] As noted in our 2013 Guidelines, we consider conditioning variables should be used symmetrically through time to avoid bias. That is, irrespective of whether each conditioning variable indicates a higher or lower MRP at any given time, we will continue to consider them consistently over time to inform our estimate.[790] [791]

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786 AER, Explanatory statement – Rathe of return guideline, December 2013, pp.94-97.

787 Frontier, *Ausgrid's Rate of Return*, April 2018, pp128-131, section 18.5.2.

788 AER, Explanatory statement – Rathe of return guideline, December 2013, pp.94.

789 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, pp.112-113.

790 AER, Explanatory statement – Rathe of return guideline, December 2013, pp.92.

791 AER, *APA VTS Final Decision – Rate of Return*, November 2017, pp.220-228.

We consider that the submissions have not presented us with evidence to persuade us that we should change our 2013 Guidelines position on the role of conditioning variables.

7.3.5.1 Implied volatility

The implied volatility approach assumes that the MRP is the price of risk multiplied by the volume of risk (volatility).[792]

Figure 21 shows volume of risk in the market portfolio estimated using the implied volatility index up to 1 May 2018. Implied volatility has been lower over the past 12 months with an average of 12.76 compared to a long term average (since 1997) of 17.8. Between the start of 2010 and the time we finalised our 2013 Guidelines the implied volatility average was 18.66.

During 2015 and 2016 there was a slight increase in volatility which increase was also seen in other conditioning variables. There are spikes around that time in almost all of the conditioning variables shown, however they have all flattened out again and suggest volatility is below the long run average. This is due to the ASX (and global markets) posting major lows from August 2015 to February 2016[793] from a range of factors such as falls in the US stock market, concerns with quantitative easing and falling oil prices.[794]

Volatility has been below the long term average for most of the period since our 2013 Guidelines, and has been significantly below the average of the 5 years that led up to the 2013 Guidelines. These consistently lower volatility values indicate that there has been less risk in the market over the past years. We have previously received advice that it is unlikely to have a relatively high MRP when implied market volatility is low.[795] Whilst there is no guarantee volatility will remain low, the current persistent trends suggest we are below the long term average with no indication that the series is mean reverting. It is also important to note that an increase in volatility alone would not necessarily drive an increase in the MRP.

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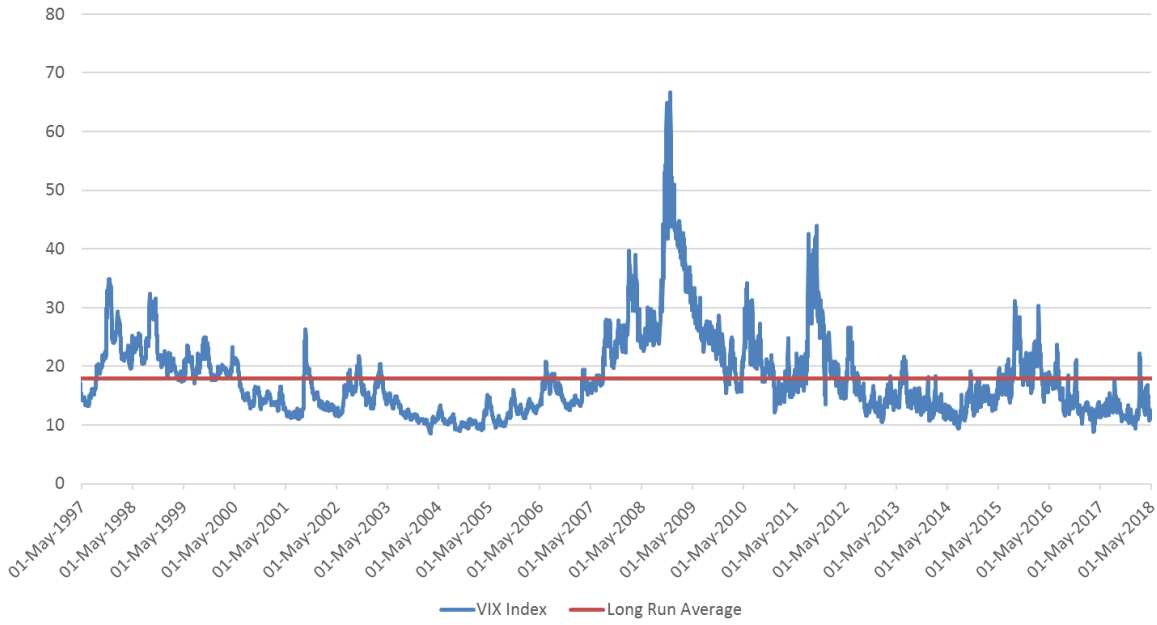
[792] This was based on Merton, R.C., On estimating the expected return on the market: An explanatory investigation, *Journal of Financial Economics*, 1980, Vol 8, pp.323–361.

[793] https://afma.com.au/data/afmr/2016%20AFMR.pdf;

[794] *https://www.reuters.com/article/us-usa-markets-idUSKCN0VL0XO*

[795] Partington and Satchell, *Report to the AER: Discussion of submissions on the cost of equity*, 29 May 2017, p.47.

Figure 21 Volatility Index of ASX200



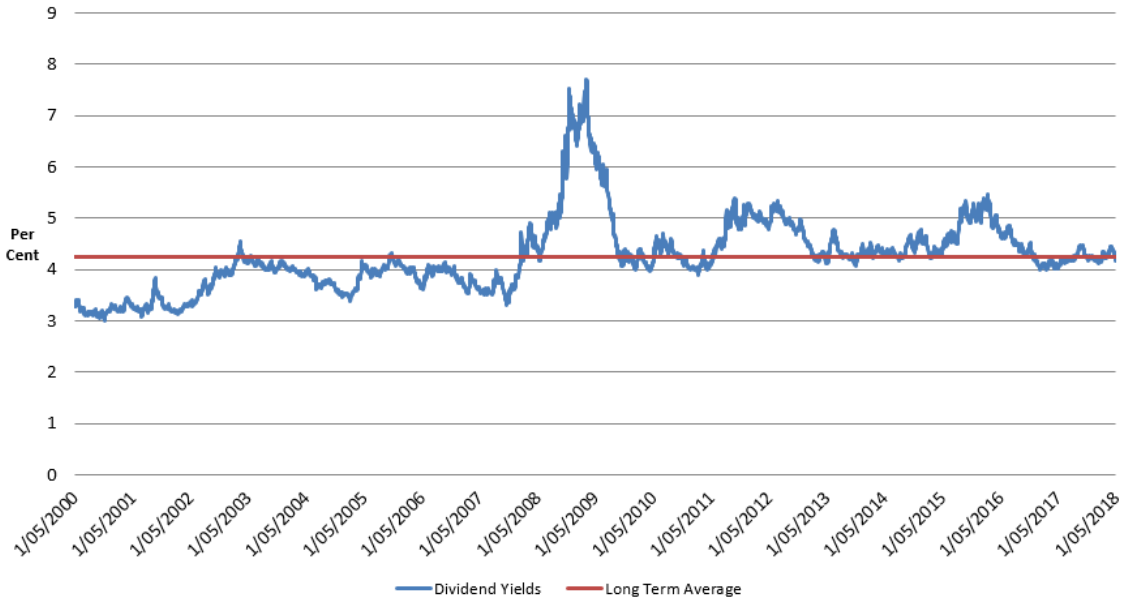
Source: AER analysis; ASX200 VIX volatility index, sourced via Bloomberg code AS51VIX from 2/01/2008 and code CITJAVIX prior to 2/01/2008. Long run average taken from the start of the data series in 1997.

7.3.5.2 Dividend yields

Consistent with our 2013 Guidelines, we use dividend yields as a directional indicator of the MRP. We do this by comparing current dividend yields with the average over time. [796]. Figure 22 shows the dividend yields against their historical average up to 1 May 2018. As shown, dividend yields are currently sitting around their long term average of 4.25 per cent. It also shows that dividend yields increased in 2015, decreased in 2016 and again saw an increase in early 2018. Overall, there is no clear trend away from the long term average and therefore does not provide an indication about the current direction of the MRP.

[796] AER, Explanatory statement – Rate of return guideline (appendices), December 2013, p.94.

Figure 22 Dividend Yields from ASX200



Source: AER analysis; sourced via Bloomberg code AS51. Long term average taken from the start of the data series in 2000.

7.3.5.3 Credit spreads

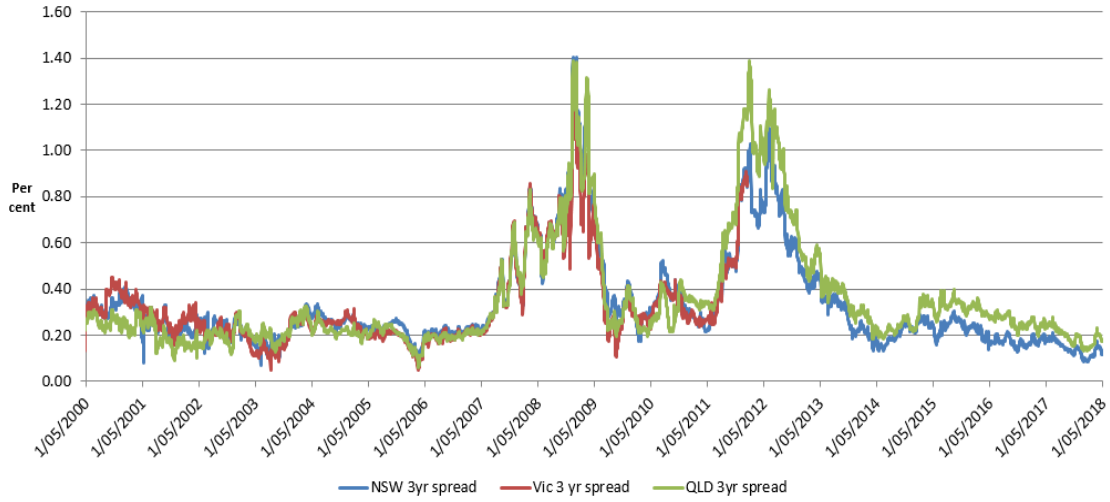
Consistent with our 2013 Guidelines, we use credit spreads as a directional indicator to inform our MRP estimate.[797] Credit spreads are the spreads between the risk free rate (the yield on Australian government securities) and the return on debt for different debt instruments. We look at whether the spreads are widening, stabilising or narrowing as an indicator of changes in market conditions

Figure 23 shows the spread between state government debt and the Australian government debt up to 1 May 2018.[798] As shown, credit spreads peaked during the 2008 global financial crisis (GFC) and then increased significantly in 2011-12. The spreads have been slowly trending lower since 2015 and are now around pre GFC levels.

[797] AER, Explanatory statement – Rathe of return guideline, December 2013, pp.96.

[798] Using debt with 3 years term to maturity as more data are available.

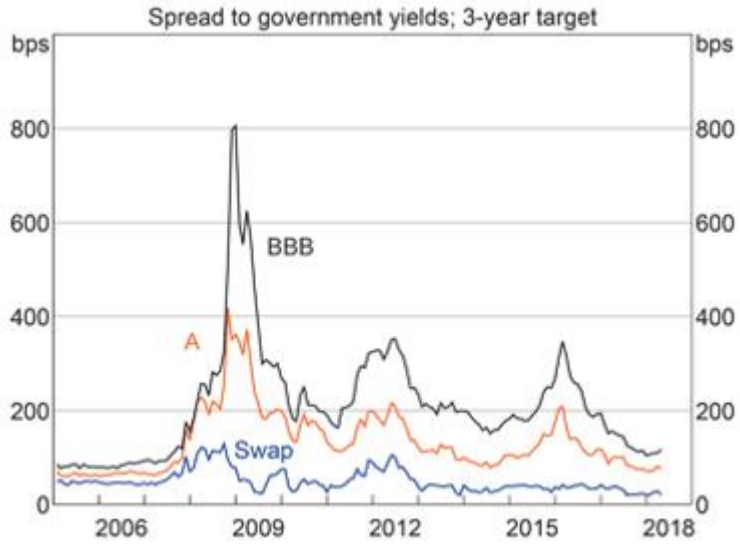
Figure 23 Spread of State Government Debt



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 24 shows the credit spreads for A-rate and BBB rated corporate debt instruments over yields on Australian government securities. These credit spreads spiked during the GFC and again increased in 2012. The spreads are showing a clear downward trend since 2015 and currently sitting around pre GFC levels. The swap rate spread is sitting lower than pre GFC levels.

Figure 24 Australian Bond spreads over Government Yields



Source: RBA, Chart Pack, download May 2018

7.3.6 Other Regulators

We consider our point estimates of 6 per cent is within the range from other regulators' decisions.

As part of the 2013 Guidelines we looked at other regulators' estimates for the MRP.[799] In response to that we have received submissions that stated the exercise was largely circular and achieved little.[800]

For the upcoming guideline we propose to continue looking at other regulators' decisions. However, we would look at the rationale and arguments put forward in support of/opposition to the evidence and methods.

We also want to ensure that there is no evidence in consideration elsewhere that we have not been made aware of or considered.

The table below summarises MRP values set by other Australian regulators.

Table 28 MRP from past decisions by other regulators

	MRP (per cent)
min	6.00
max	7.75

Source: AER Analysis of regulatory decisions from IPART, ERA, QCA and ESCV from March 2017 to March 2018.[801]

We do not consider foreign regulators as part of our decision because they often have different regulatory objectives and regimes, as such it is hard to give a direct comparison on rate of return parameters such as MRP. This is the same position we have taken in previous decisions and we see no reason to depart from this with no new evidence submitted.[802]

7.3.6.1 IPART

IPART currently sets an MRP based on 50 per cent weighting to historic averages and 50 per cent on current estimates. To build the historic average it looks at excess returns, whereas for the current estimates it relies largely on estimates from 5 versions of the DGM. There is also consideration of a method which uses 4 economic indicators when estimating the current estimate of MRP. [803]

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799 AER, *Explanatory Statement - Rate of Return Guideline (Appendices*), December 2013, p100.

800 Frontier, *The Market Risk Premium*, September 2016, p.32.

801 IPART, Review of prices for rural bulk water services from 2 July 2017 to 30 June 2021 – Final Report, June 2017, IPART, Sydney Desalination Plant Pty Ltd – Review of prices from 1 July 2017 to 30 June 2022 – Final Report, June 2017, IPART, Prices for wholesale water and sewerage services, Sydney Water Corporation and Hunter Water Corporation – Final Report, June 2017, IPART, Draft Report – Review of Fares for Private Ferry Services, September 2017, IPART, Draft Report - Maximum fares for rural and regional bus services from 1 January 2018, October 2017, ERAWA, Determination on the 2017 WACC for the Freight and Urban Railway Networks, and for Pilbara railways, October 2017, QCA, Seqwater Bulk Water Price Review 2018-21, March 2018, IPART, Review of fares for private ferry services – Final Report, December 2017, IPART, WACC Bimanual update, February 2018

802 AER, *APA VTS Final Decision - Attachment 3*, November 2017, p.87

803 IPART*, IPART Review of our WACC Methodology*, February 2018, p.52

We have stated previously that taking a simple average of multiple equity models, especially in this case where most have the same input of growth rate with no consideration for potential error, does not improve the validity of the model's results. This averaging also does not improve the potential biases that we consider are prevalent in the models. We have received advice that this would only be appropriate if that these were different estimates which were on average unbiased.[804]

When considering a historical MRP, IPART agree that excess returns data leads to an MRP estimate of 6 per cent.[805]

7.3.6.2 ERA

The ERA, in its recent draft decision for the Western Power network, used historic returns, dividend growth models and conditioning variables in order to arrive at its estimated of the MRP.[806] Their MRP is calculated over a 5 year risk free rate, and arrived at a value of 6.2 per cent.[807]

In forming a lower bound it used a combination of the arithmetic and geometric averages and arrived at a historic estimate of the MRP at 5.6 per cent.[808] It relies largely on the 2 stage DGM in forming its upper bound based on the DGM, and arrived at 7.6 per cent. The ERA then use conditioning variables to support an MRP towards the lower end of this range, arriving at an estimate of 6.2 per cent.[809]

The ERA presents evidence that we have considered and take a similar stance, using supporting evidence from our own previous decisions. We note that its historic estimate of the MRP and final point estimate are within our HER range of 5.0–6.5 per cent.

7.3.6.3 International Evidence

The 4 May 2018 submission from the Joint Energy Networks suggested that evidence from international firms put our equity risk premium as materially lower than other jurisdictions.[810] We do not take international regulator data into account because of the issues surrounding differences in regulatory procedures and tasks. This has been covered in previous decisions.[811]

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804 Partington and Satchell, *Report to the AER: Discussion of estimates of the return on equity, April 2017*, p. 27.

805 IPART*, IPART Review of our WACC Methodology*, February 2018, p.47

806 ERA, *Draft Decision on Proposed Revisions for the Western Power Network*, 2 May 2018, pp.20-46

807 ERA, *Draft Decision on Proposed Revisions for the Western Power Network*, 2 May 2018, p. 63

808 ERA, *Draft Decision on Proposed Revisions for the Western Power Network*, 2 May 2018, p.29

809 ERA, *Draft Decision on Proposed Revisions for the Western Power Network*, 2 May 2018, pp.20-46

810 AGIG, CitiPower, Multinet, Powercor, SA Power Networks, United Energy, Submission to Rate of Return Guideline Review, 4 May 2018, p.5;

811 AER*, APA VTS Final Decision – Rate of Return*, November 2017, pp. 296-297.

7.3.7 Wright Approach

We continue to observe results from the Wright model at the overall equity level but consistent with our 2013 Guidelines we will not consider its outcome to estimate the MRP.

The Wright approach uses a constant return on the market portfolio, estimated via either historical market returns or methods such as the DGM, and the prevailing risk free rate to estimate the MRP. As such it does not calculate the MRP as an observable parameter, but as the difference between the historic market returns and the prevailing risk free rate.

Under the 2013 Guidelines the Wright approach was given consideration at the overall return on equity level and no consideration in estimating the MRP.[812] The view that the Wright Approach is valid and should be used by us in our MRP estimation processes was presented by several stakeholders including APA, the ENA and Cheung Kong Infrastructure.[813] They submitted, and were supported in the concurrent evidence session by Gray and Wheatley, that the Wright Approach should form one of the two bounds we consider when starting out on our estimate of the MRP.[814]

We also received submissions from stakeholders such as the CCP and the ECA stating that the Wright approach should not be given weight at any level, due to lack of evidence of its theoretical underpinning in practice.[815] During the concurrent evidence session this view was also supported.[816] It was raised in the concurrent evidence session by Mr Sadeh that there would need to be evidence as to the inverse relationship between MRP and the risk free rate to consider the Wright approach.[817]

The Wright Approach relies heavily on the assumption of a perfect, or at least near perfect, negative relationship between the risk free rate and the MRP. That is, for every basis point the risk free rate decreases the MRP increases the same amount, or vice versa, in order to keep the return on equity constant. Since the 2013 Guidelines we have received evidence that the model has no theoretical basis in Australia and is not an appropriate tool for regulatory use, nor is it used by market practitioners.[818]

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812 AER, *Explanatory statement: Rate of return guideline (appendices), December 2013*, pp. 24–27.

813 ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.77-79; Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, p.4.

814 AER, Second Concurrent Evidence Session, 5 April 2018, p. 69.

815 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, pp.103-112.

816 AER, *Second Concurrent Evidence Session*, 5 April 2018, p. 69.

817 AER, *Second Concurrent Evidence Session*, 5 April 2018, p. 72.

818 Rankin and Idil*, A century of Stock-Bond Correlations*, September 2014, Partington and Satchell, *Cost of Equity issues 2016 Electricity and Gas Determinations,* April 2016, pp30-31; Partington and Satchell, Report to the AER, May 2018, p.34-35, AER, Draft decision - Multinet Gas access arrangement 2018-22, Attachment 3 - Rate of return, p.220. Our analysis of independent valuation reports for the 2018 rate of return guideline review also indicated no reports appeared to use the Wright CAPM.

As discussed above, we consider there is neither strong theoretical reasons, nor strong empirical evidence, to support an ongoing and consistent inverse relationship between the MRP and the risk free rate. We also note the evidence since 2013 has increased our concerns about relying on the Wright approach.

7.4 Summary of submissions

The table below contains responses to a discussion paper in March 2018 on market risk premium to provide background on the matters to be discussed at the concurrent evidence session, alongside questions to frame that discussion.[819]

Table 29 Summary of submissions on market risk premium

Key point	Submission	Stakeholder	AER response
The Construction of MRP	The MRP is not an exogenous variable and should be formed as the difference between expected total return and the prevailing risk free rate	APA[820]	We disagree. We consider that our approach for estimating the MRP is consistent with common practice and has been previously been acknowledged by APA and APTPPL as used by practitioners and in financial text books and literature.[821] Partington and Satchell have also previously advised that it is common market practice to 'treat the MRP as the exogenous variable'[822]to the Sharpe-Lintner CAPM. We continue to note APA's proposal suggests an inverse and perfectly offsetting relationship between the MRP and risk free rate which we disagree with. APA's proposal also bears resemblance to the Wright approach. We have regard to this material and concluded that its weaknesses limit its use in estimating the MRP.
	Estimating MRP directly is likely to overstate the risks faced by a natural monopoly firm	CANEGROWERS, The Australia Institute, PIAC[823]	Estimating the realised MRP directly remains appropriate to the SLCAPM and removes as much subjectivity from the regulatory process as possible.
The Dividend Growth Model	The DGM is a useful estimation tool and should be used by the AER in its MRP estimation process	APA, ATCO, APGA, Cheung Kong, ENA, Ergon Energy and Energex, QTC,	Conceptually, the DGM has some merit as a theoretical model to estimate the MRP but issues surrounding inputs, potential biases and sensitivities have limited its use by us.

819 AER, *MRP Risk Free Rate Averaging Period and Automatic Application Discussion Paper*, March 2018.

820 APA, *APA submission responding to AER issues paper,* 12 December 2017, pp. 7-9.

821 AER, APA VTS final decision, November 2017, p. 78; APA VTS, Access arrangement revision proposal submission, 14 August 2017, p. 75 ; APTPPL, Access arrangement submission, 14 August 2017, p. 68.

822 Partington and Satchell, Report to the AER: Discussion of estimates of the return on equity, April 2017, pp. 17, 34.

823 CANEGROWERS, *Letter to AER re:RoR Review*, 19 December 2017, p.4; Australia Institute, *Submission on rate of return issues paper*, 12 December 2017, p. 6; PIAC; *PICA letter to the AER*, December 2017, p.2.

		Spark Infrastructure[824] APGA, NSG, APA, ENA, Joint Energy Networks[825] (Frontier)[826]	
	The DGM should not be used by the AER in MRP estimation	ECA, Energy Users Association of Australia, MEU, CCP[827] CCP[828]	We do not propose to use the DGM to directly inform the MRP estimate in this guideline review. Whilst it has potential to be a useful tool, the range of results that 'suitable' models can produce does not give confidence in selecting a precise estimate looking forward.
	The DGM should only use growth rates formed from GDP growth.	APGA, ENA[829]	Whilst we consider other growth rates may be applicable we will not be changing them in this review, keeping the previous growth rates which were based on GDP growth rates.
	There is evidence to suggest appropriate DGM growth rates are falling	CRG[830]	We agree that the range of appropriate DGM growth rates may be falling and have considered issues with growth forecasts in exercising our judgement.
	The DGM's overall return on equity estimate has been more stable than	ENA[831] (Frontier)[832]	We have maintained since the 2013 Guidelines that the DGM's estimate of the overall RoE is overly stable and not

824 APA, *APA submission responding to AER issues paper,* 12 December 2017, pp.11-12; ATCO Gas Australia, *Response to Revie of Rate of Return Guideline – Issues Paper* , 12 December 2017, p.8; APGA, *Submission to the Issues Paper*, 12 December 2017, pp. 9-10; Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, p.4; ENA, *Response to AER Issues Paper*, 12 December 2017, p.30; Ergon Energy and Energex, *Ergon Energy and Energex submission on AER Issues Paper*, 12 December 2017, p.6; Queensland Treasury Corporation, *QTC submission to the RoR Guideline Review Issues Paper*, December 2017, p.5.

825 APGA, *Submission on AER Review of ROR Guideline*, 04 May 2018, pp.12-13; Network Shareholder Group, *NSG Submission to the RORG review*, 04 May 2018, pp. 15-17; APA, *Submission on Rate of Return Review,* 04 May 2018, pp.28-32; ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.67-71; AGIG, CitiPower, Multinet, Powercor, SA Power Networks, United Energy, Submission to Rate of Return Guideline Review, 4 May 2018, p.6.

826 Frontier submitted a report as part of AusGrid's reset. This is not part of the guideline process but is still considered.

827 CCP 16, *Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, p.98; ECA, *Response to the AER Issues Paper*, December 2017, p.22; EUAA, AER Rate of Return Issues Paper October, December 2017, p.9; Major Energy Users, *Submission by the MEU to the review of the rate of return guideline*, 18 December 2017, p.16.

828 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, p. 115.

829 APGA, *Submission on AER Review of ROR Guideline*, 04 May 2018, pp.12-13; ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.73-75.

830 CRG, *Submission to the AER rate of return guideline review,* 04 May 2018, p.56.

831 ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.67-71.

832 Frontier submitted a report as part of AusGrid's reset. This is not part of the guideline process but is still considered.

	the AER's allowed RoE and should be considered appropriate		applicable for use in a regulatory framework. We do not change this position.
	The DGM's MRP estimates are too volatile for use in a regulatory context and do not line up with other market data	CCP[833]	Our analysis shows that DGM-based MRP estimates move inversely to changes in the risk free rate, with the risk free rate accounting for almost 80 per cent of the changes in some cases.
	The Variable Growth Rate DGM has merit, and should be investigated further as to its regulatory uses	CCP[834]	We will continue to investigate and monitor the reasonableness of the variable growth rate DGM.
Fixing the MRP	Fixing the Return on Equity should be the aim rather than fixing the MRP	ATCO, ENA[835]	We disagree and note that sufficient evidence has not been provided by ATCO and ENA to persuade us that the return on equity is stable over time.
	The MRP could be fixed for the duration of the guideline as long as method is clear, explicit and replicable	APGA, CCP, EUAA, MEU, Ergon Energy, Jemena, NSG[836] EvoEnergy[837]	With a binding guideline now in (draft) legislation we consider a fixed MRP/ERP would be the best way to achieve the legislative objectives. We have consistently and transparently set out and explained our approach for estimating the MRP.
	The MRP should be formulaically applied throughout the guideline, but not fixed	QTC, ENA[838] EvoEnergy, Jemena[839] Frontier[840]	Our position is to apply a fixed MRP over the life of the guideline, as discussed in section 3.2.
	A fixed MRP should be subject to strict re-	APGA, Ergon Energy and	Draft legislation on the binding guideline does not allow for re-openers.

833 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, pp.109-111.

834 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, pp.111-112.

835 ENA, *Response to AER Issues Paper*, 12 December 2017, p.23; ATCO Gas Australia, *Response to Revie of Rate of Return Guideline – Issues Paper* , 12 December 2017, p.7.

836 APGA, *Submission to the Issues Paper*, 12 December 2017, p. 8; CCP 16, *Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, pp.81-89; EUAA, AER Rate of Return Issues Paper October, December 2017, p.9; Ergon Energy and Energex, *Ergon Energy and Energex submission on AER Issues Paper*, 12 December 2017, p.5; Jemena, *Submission on Rate of Return issues paper*, December 2017, pp.3-4; Network Shareholder Group, *Submission on rate of return issues paper*, 12 December 2017, p.9.

837 EvoEnergy, *Submission on Rate of Return Guideline Evidence Session*, 04 May 2018, p.4.

838 Queensland Treasury Corporation, *QTC submission to the RoR Guideline Review Issues Paper*, December 2017, p4; ENA, *Response to AER Issues Paper*, 12 December 2017, p.30.

839 EvoEnergy, *Submission on Rate of Return Guideline Evidence Session*, 04 May 2018, p.4; Jemena, *Submission on concurrent expert sessions and discussion paper*, 4 May 2018, p.3.

840 Frontier submitted a report as part of AusGrid's reset. This is not part of the guideline process but is still considered.

	openers throughout the guideline period	Energex, ENA, NSG[841] NSG[842]	
	The AER should consider not having re-openers in the guideline, or limit their potential to re-open automatically	CCP, MEU[843]	Draft legislation on the binding guideline does not allow for re-openers.
	The AER's previous approach of setting a fixed MRP has resulted in return on equity estimates inconsistent with market evidence.	EvoEnergy[844]	We note that our regulatory decisions made since the 2013 Guidelines do not apply a fixed MRP. Rather, at each regulatory determination we considered whether we should depart from our 2013 Guidelines to achieve the allowed rate of return objective.
	Applying a formula to MRP estimation is not appropriate as it could be taken out of context by volatile estimates	CCP[845]	We do not apply a formula. See section 3.2.
	Of all the WACC parameters MRP should be the slowest to change, so fixing the MRP is in line with expectations	CCP[846]	Our position is to apply a fixed MRP over the life of the guideline which is discussed in section 3.2.
Historical Excess Returns	Geometric Averages are not appropriate in the MRP estimation process	ENA[847] APGA, APA, ENA, Jemena[848] (Frontier)[849]	We consider that geometric averages can offer useful information for estimating the MRP.
	Geometric averages	Ian McAuley[850]	We consider both geometric and arithmetic

841 APGA, *Submission to the Issues Paper*, 12 December 2017, p. 8; ENA, *Response to AER Issues Paper*, 12 December 2017, p.30; Ergon Energy and Energex, *Ergon Energy and Energex submission on AER Issues Paper*, 12 December 2017, p.5; Network Shareholder Group, *Submission on rate of return issues paper*, 12 December 2017, p.9.

842 Network Shareholder Group, *NSG Submission to the RORG review*, 04 May 2018, pp. 15-17.

843 Major Energy Users, *Submission by the MEU to the review of the rate of return guideline*, 18 December 2017, p.16; CCP 16, *Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, pp.81-89.

844 EvoEnergy, *Submission on Rate of Return Guideline Evidence Session*, 04 May 2018, p.4

845 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, pp.116.

846 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, p. 95.

847 ENA, *Response to AER Issues Paper*, 12 December 2017, p.27.

848 APGA, *Submission on AER Review of ROR Guideline*, 04 May 2018, pp. 11-12; APA, *Submission on Rate of Return Review,* 04 May 2018, pp.28-32; ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.79-80; Jemena, *Submission on concurrent expert sessions and discussion paper*, 4 May 2018, p.3.

849 Frontier submitted a report as part of AusGrid's reset. This is not part of the guideline process but is still considered.

	should be given more weight in the MRP estimation process	CRG, CCP[851]	averages and take into account their strengths and weaknesses in exercising our judgement.
	Only single year arithmetic returns from periods of over 50 years should be used	ENA[852] (Frontier)[853]	We accept that standard errors are improved by using a longer data set. However, as financial conditions change through time, as do investors required risk premiums, we consider that estimates using more recent data are likely to be less biased relative to the true forward looking MRP there is likely to be useful information contained in estimates from more recent periods. Therefore, we consider that we should continue to observe estimates from a range of time periods including more recent periods.
The Wright Approach	The Wright Approach should be given more weight	CKI, APA, ENA[854] ENA, Joint Energy Networks[855] (Frontier)[856]	Given there is neither strong theoretical reasons, nor strong empirical evidence, to support an ongoing and consistent inverse relationship between the MRP and the risk free rate we continue to be of the view that the Wright approach should not inform our MRP estimate. .
	The Wright Approach should be given no weight	CCP[857]	We do not give the Wright approach any weight in estimating the MRP.
MRP selection	The AER was overly cautious in 2013, selecting higher parameter estimates than advised leading to a higher ROR than	CCP, ECA[858] Energy Australia, CCP[859]	We have set out to select the best estimate of each parameter at the current time in an unbiased manner, given the regulatory aim of estimating a 10 year rate of return.

850 Ian McAuley, *Submission to Australian Energy Regulator on Rate of Return Guideline*s, December 2017, p.4; CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, pp.103-107.

851 CRG, S*ubmission to the AER rate of return guideline review,* 04 May 2018, pp.53-54.

852 ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.80-82.

853 Frontier submitted a report as part of AusGrid's reset. This is not part of the guideline process but is still considered.

854 Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, p.4; APA, *APA submission responding to AER issues paper,* 12 December 2017, pp. 7-9; ENA, *Response to AER Issues Paper*, 12 December 2017, p.30.

855 ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.77-79; AGIG, CitiPower, Multinet, Powercor, SA Power Networks, United Energy, Submission to Rate of Return Guideline Review, 4 May 2018, p.6.

856 Frontier submitted a report as part of AusGrid's reset. This is not part of the guideline process but is still considered.

857 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, pp.103-112.

858 CCP 16, *Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, p.81; ECA, *Response to the AER Issues Paper*, December 2017, p.24.

859 Energy Australia, *Submission to AER Rate of Return Evidence Sessions*, 04 May 2018, p.2; CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, pp.103-107.

	necessary		
	An MRP of 7.0 per cent is more appropriate than the 6.5 per cent set previously which does not account for increased risk and forward looking estimates	Network Shareholder Group, ENA, Joint Energy Networks[860] (Frontier)[861]	For the reasons discussed in this chapter, we do not agree.
	The MRP selected by the AER in the CAPM should be discounted to account for the lack of risks faced by the networks compared to other market based companies	CRG[862]	We adopt the SLCAPM as the foundation model for estimating the return on equity. In this model, systematic/compensable risks are reflected in the equity beta parameter.
	The MRP could be set as low as 3.6 per cent based on the current set of data and risks facing firms	CRG[863]	We consider that the current data would not support an MRP of 3.6 per cent.
	Trends in historic data suggest globalisation has reduced market risk in Australia	CRG, CCP[864]	We have considered evidence that suggests a downward trend in realised MRP.
Survey Evidence	Survey Evidence highlights market expectation and is a useful source of evidence	Energy Australia[865]	Expert advice and discussion in the expert session suggests that whilst its forecasting ability is limited, survey data is useful for measuring expectations. Survey evidence continues to inform our MRP estimate.
	Evidence from surveys is extremely limited and should not be considered in a regulatory context, at least without extreme caution	APGA, APA[866] (Frontier)[867]	We recognise that surveys have limitations and are not at a level of reliability as to give it weight as a direct estimation method of the MRP.
Other Regulator	Other regulators have	NSG, ENA[868]	We propose to continue looking at other

860 Network Shareholder Group, *NSG Submission to the RORG review*, 04 May 2018, pp. 15-17; AGIG, CitiPower, Multinet, Powercor, SA Power Networks, United Energy, Submission to Rate of Return Guideline Review, 4 May 2018, p.6; ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.65-66.

861 Frontier submitted a report as part of AusGrid's reset. This is not part of the guideline process but is still considered.

862 CRG, *Submission to the AER rate of return guideline review,* 04 May 2018, p.56.

863 CRG, *Submission to the AER rate of return guideline review,* 04 May 2018, p.57.

864 CRG, *Submission to the AER rate of return guideline review,* 04 May 2018, p.53; CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, pp. 99-102.

865 Energy Australia, *Submission to AER Rate of Return Evidence Sessions*, 04 May 2018, p.2.

866 APGA, *Submission on AER Review of ROR Guideline*, 04 May 2018, p. 12; APA, *Submission on Rate of Return Review,* 04 May 2018, pp.28-32.

867 Frontier submitted a report as part of AusGrid's reset. This is not part of the guideline process but is still considered.

Evidence	increased their MRP estimates since the 2013 Guidelines	(Frontier)[869]	regulators' decisions and give these appropriate consideration.
	International regulator evidence shows the AER is not in line with other jurisdictions	Joint Energy Networks[870]	We consider that international regulators should not be included when considering other regulators' decisions. Their rate of return decisions are unlikely to be comparable due to a number of differences. For example, they are for firms regulated under different regulatory frameworks. .
Market Evidence	Debt Risk Premiums are an obvious cross check and indicate the risk in the equity market has decreased	CCP[871]	We continue look at credit spreads as one of the conditioning variables that inform our estimate of the MRP.
	Market evidence should be used by the AER to consider whether any change in MRP fits with market conditions	CCP[872]	We continue to have regard to conditioning variables as directional indicators for the MRP. This allows us to incorporate information from market conditions when estimating the MRP estimate.

868 Network Shareholder Group, *NSG Submission to the RORG review*, 04 May 2018, pp. 15-17; ENA, *Response to AER Rate of Return Discussion Papers and Expert Sessions*, 04 May 2018, pp.65-66.

869 Frontier submitted a report as part of AusGrid's reset. This is not part of the guideline process but is still considered.

870 AGIG, CitiPower, Multinet, Powercor, SA Power Networks, United Energy, Submission to Rate of Return Guideline Review, 4 May 2018, p.5.

871 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, p. 95.

872 CCP16, *Submission to the AER Rate of Return Guideline Review concurrent evidence sessions*, 4 May 2018, pp.112-113.

8 Equity beta

The equity beta is a key parameter within the Sharpe–Lintner CAPM. It measures the 'riskiness' of a firm's returns compared with that of the market. Specifically, the equity beta measures the standardised correlation between the returns on an individual risky asset or firm with that of the overall market.[873]

Generally, investors are assumed to be able to diversify away non-systematic (or business-specific risk). Therefore investors do not require compensation for business specific risk.[874] Compensation is only required for bearing systematic risk. Sources of systematic risk include changes in real GDP growth, inflation, currency, prices, commodity prices and real long term interest rates. A firm's sensitivity or exposure to these risks will depend on its business activities and its level of financial leverage.[875]

The relevant 'risk' is a similar degree of risk to that faced by a firm in the provision of its regulated energy network services.[876] Accordingly, we use the data from such firms that are relevant to estimates of beta for our regulatory task.

8.1 Draft decision

Based on the balance of evidence, we have selected a point estimate of 0.6 which is towards the middle of our range of 0.4–0.8 and reflects the information available.

We have maintained the overall approach to estimating the equity beta parameter. That is, we give most weight to empirical estimates of relevant Australian energy network businesses and less weight to other relevant evidence. This is supported by a number of submissions.[877]

We have come to this decision by applying the estimation approach that we set out in our 2013 Guidelines and applied in each subsequent regulatory determination. This approach is based on considering the same relevant classes of evidence that were identified in our 2013 Guidelines, namely:

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873 R. Brealey, S. Myers, G. Partington and D. Robinson, *Principles of corporate finance*, McGraw–Hill: First Australian edition, 2000, pp. 186–188 (Brealey et al, *Principles of corporate finance*, 2000).

874 G. Pierson, R. Brown, S. Easton and P. Howard, *Business Finance*, 8th Edition, p. 214.

875 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 (McKenzie and Partington, *Estimation of equity beta*, April 2012). This report is available on the AER website at: http://www.aer.gov.au/sites/default/files/RBP%20gas%20transmission%202012%20-20Equity%20Beta%20report%20-%20McKenzie%20and%20Partington%20(Public)%20-%203%20April%202012_0.pdf

876 NER 6.5.2(c), 6A.6.2© and NGR 87(3)

877 Cheung Kong Infrastructure, AER Issues Paper – Review of the rate of return guideline, 12 December 2017, pp. 3–4; Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 89; Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 68; Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 39.

- Giving most weight to empirical estimates of relevant Australian energy network businesses
- Having regard to:
    - conceptual considerations of the risks of energy network businesses relative to the market portfolio
    - empirical estimates of foreign energy network businesses
    - the theoretical underpinnings of the Black CAPM
    - the value of stability and predictability to industry and consumers

We received divergent submissions on the merits of each type of evidence. For example, networks proposed giving (more) weight to international estimates while consumer groups opposed this proposal.

We have reviewed the relevant evidence for their strengths, weaknesses and suitability for our regulatory task in light of these submissions.

We continue to give most weight to empirical estimates because they provide information from firms that are reasonably comparable to firms in the supply of the regulated energy services. We have updated our empirical analysis[878] using the same comparator set as that used in our 2013 Guidelines. Our update of the empirical analysis to 2018 supports an empirical range of 0.4–0.8 with clustering in the 0.5–0.6 range. We consider our comparator set of domestic firms is the best empirical guide currently available. This is because international firms and other Australian infrastructure firms carry different risks and characteristics compared to firms in the supply of regulated energy network services.

From a range of 0.4–0.8, we consider that an equity beta value of 0.6 will best promote the legislative objectives for the following key reasons:

- We give most weight to estimates from the longest estimation period because short term estimates can be unduly influenced by factors such as one-off events (for example, the Global Financial Crisis), shocks and interest rate movements. Estimates from the longest estimation period cluster in the 0.5–0.6 range (see Figure 25) and the average[879] of re-levered OLS estimates is 0.51.
- The average[880] of weekly re-levered OLS estimates across all periods is 0.57.
- We use conceptual analysis and international estimates as cross checks for our empirical range. The point estimate of 0.6 (and empirical range of 0.4–0.8) is consistent with our expectation that the equity beta of a firm supplying the

878 By including data up to 2 March 2018

879 Average of fixed weight portfolio estimates and averaged firm-level estimates.

880 Average of fixed weight portfolio estimates and averaged firm-level estimates across all three estimation periods (longest, post tech boom excluding GFC and recent 5 years)

regulated energy services will be below 1.0 due to the overall low risk exposure. Our update of international estimates support an equity beta below 1.0.

- We have had regard to (and further consideration of) the Black CAPM and the potential for low beta bias. However, we agree with the CCP16 that there is uncertainty around empirical analysis of the Black CAPM and it is not generally applied by market practitioners or regulators. As such, we do not consider that an uplift beyond the empirical estimates for our comparator set is warranted.
- We observe some increase in estimates since the 2013 Guidelines. However, the overall empirical results, particularly the longest estimation period, support a value of less than 0.7.
- We recognise that the inclusion of some comparator firms with a high proportion of unregulated operations would lead to higher empirical equity beta estimates than otherwise would be. Although this would likely support a value below those from the whole comparator set, we consider that a reduction of 0.1 (from 0.7 to 0.6) is warranted at this time to provide an estimate that is more in line with empirical estimates. We note that we reduced the equity beta from 0.8 to 0.7 in 2013 even though longer term estimates were clustered below those values. In part, we were conscious of the need to promote stability and predictability and therefore decided not to make a larger change.
- We have considered whether we should employ a different value between gas and electricity businesses. Gas businesses submitted that they are subject to greater risk. Overall, we conclude that systematic risks between gas and electricity networks are sufficiently similar to warrant a common equity beta.

Our consideration is set out in section 8.3.

8.2 Stakeholder consultation and submissions

We released an issues paper in October 2017 outlining key areas of the Guideline review process. In response, stakeholders have made submissions which were summarised in our equity beta discussion paper.[881] A summary of the submissions is in our March 2018 Discussion Paper.[882] We do not repeat them here but they are discussed in section 8.3 as part of our consideration of issues.

8.2.1 Discussion paper and concurrent expert evidence sessions

We released a discussion paper in March 2018 on equity beta to provide background on the matters to be discussed at the concurrent evidence session and questions to frame that discussion.[883]

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[881] AER, Discussion paper equity beta, March 2018

[882] AER, Discussion paper equity beta, March 2018

[883] AER, Discussion paper equity beta, March 2018.

CEPA published a statement of agreed positions with areas of agreement and disagreement from the sessions.[884] A summary is provided in the Table 30 below:

[884] Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018

Table 30 Areas of agreement and disagreement on beta

Areas of agreement	Areas of disagreement
• Beta should be assessed from stock market data[885] • Technological risk does not need to be considered separately in estimating equity beta[886] • No simple adjustments can be made to make international data comparable to domestic data[887] • Long periods of data for estimating β are likely to produce the most statistically reliable results. [888]	• De/re-levering raw equity beta estimates[889] • Assuming a debt beta of zero[890] • Feedback loop between the AER's decision and equity beta estimates[891] • Transparency in the AER's application of the 2013 Guidelines[892] • The appropriateness of the current comparator set[893] • The inclusion of de-listed firms in the comparator set[894] • Use of non-market data to estimate equity beta[895] • Differential beta for different types of energy businesses[896] • Transparency in the AER's selection of point estimate[897] • If equity beta has changed since 2013[898] • Black CAPM and low beta bias[899] • Adjustment for low beta bias[900] Stability [901]

Source: Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018

885 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 42
886 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 43
887 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 46
888 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 50
889 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 39–40
890 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 41
891 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 41
892 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 42
893 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 43
894 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 47
895 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 48
896 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 49
897 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 52
898 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 52
899 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 52
900 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 53
901 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 54

The expert joint report stated that experts agreed that the weight placed on the estimates should decline in line with the length of the time since delisting.[902] This is not included in the table above because we consider this was subject to some disagreement. Not all experts were (fully) available over the course of preparing the expert joint report to present their views. The author of the joint statement also confirmed agreed positions may have been taken if no one objected rather than by requiring positive agreement and that assessing the views was not a quantitative voting exercise.[903]

We have also received submissions on the expert concurrent evidence sessions. The submissions and our considerations are discussed in section 8.3. A summary of submissions is provided in section 8.4.

8.3 Issues and the AER's considerations

We have received divergent submissions on a range of issues from stakeholders as part of this review. In forming a view on our approach, we have taken into account these submissions and further consideration of the relevant evidence. Our consideration of our approach, issues and submissions are in the sections below under the following sections:

- Conceptual analysis
- Empirical studies
- Comparator firms
- International comparators
- Black CAPM and low beta bias
- Empirical methodology
- Industry analysis
- Other information informing range and point estimate
- Range and point estimate

8.3.1 Conceptual analysis

902 Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 47.

903 See CEPA, *AER RORG Expert Joint Report*, 21 April 2018, p. 11: "It should be noted that not all experts were present in all the sessions and may therefore not have given views on all issues. The issues on which experts contributed were set out above in Section 1.1. Graham Partington (GP) was unavailable due to overseas commitments from 14 April 2018 and provided limited input from that date, but did have sight of the final draft. David Johnstone provided input on drafts until 10 April 2018.
The report indicates when most experts held a particular view. However, assessing the views was not a quantitative voting exercise, but a way of identifying alternative views and the reasons for them. Dissenting views of any expert were considered to be of value and may inform the views of the AER."

In the 2013 Guidelines we used conceptual analysis as a cross check of Australian empirical estimates.[904] This was because it allowed us to form a prior expectation of where the equity beta of a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services sits relative to the market average.[905]

Having reviewed all the materials submitted to date, we remain of the view that it is possible to determine a conceptual expectation of the systematic risk of a benchmark efficient entity relative to the market average firm. Conceptual analysis yields insight into where the equity beta for a benchmark efficient entity sits relative to the average equity beta across all firms in the market, which is 1.0 by definition.[906]

However, our conceptual analysis is necessarily qualitative in nature and is therefore used as a cross–check against the empirically derived range.[907]

In section 2.4.3, we consider the assessment of business risk and financial risk for the benchmark efficient entity suggests that the intrinsic business risk of a firm is the main driver of its systematic risk. We expect the benchmark efficient entity to have low intrinsic risk exposure (relative to the market average). We also consider the high financial leverage of the benchmark efficient entity (relative to the market average) does not necessarily correspond to an equivalently high exposure to financial risk.

On the basis of this information, we consider there are reasonable conceptual grounds to expect the overall systematic risk for the benchmark efficient entity to be below that of the market average firm. This leads to our expectation that the equity beta of the benchmark efficient entity will be below 1.0. Our consideration of the comparative systematic risk of gas and electricity service providers in section 2.4.2 leads us to conclude that a single benchmark is still appropriate.

We have considered the risks to service providers arising from technological risk, catastrophic and policy risks in section 2.4.1. Our assessment is that the sort of risks noted by service providers are not systematic and do not warrant compensation in the return on equity.

Both the ENA and Spark Infrastructure submitted that there has been changes in the risks faced by service providers which needs to be accounted for in the regulatory framework. [908]

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904 AER, *Explanatory statement to the rate of return guideline*, December 2013, pp. 86

905 For example, see: AER, Better regulation equity beta issues paper, October 2013, p. 11; AER, SAPN final decision, p. 94, 434.

906 AER, *Explanatory statement to the rate of return guideline (appendices)*, December 2013, pp. 39

907 AER, *Explanatory statement to the rate of return guideline (appendices)*, December 2013, pp. 43

908 Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 31; Network Shareholder Group, Re: Response to issues paper on the review of the rate of return guideline, 12 December 2017, pp. 9-10

It is not clear to us that there has been material changes in the systematic risk faced by service providers of regulated energy network services. The type of risks noted by service providers and network associations revolve around technology risk, policy risk and natural disasters (as noted in section 2.4.1). We do not consider these types of risk should be compensated through the rate of return as they are non-systematic and investors can diversify them away. Our view is that only systematic risk should be compensated through the rate of return and non-systematic risks should be compensated through the (expected) cashflows of regulated energy businesses.

8.3.2 Empirical studies

Our empirical estimates of equity beta are based on regressions that relate the returns on a set of comparator firms to the return on the market.

When we estimated equity beta in the 2013 Guidelines the main determinant of our estimate was empirical estimates from a comparator set of relevant firms. This comparator set was made up of Australian energy network firms with a similar degree of risk as a service provider in the provision of regulated services. We considered that empirical estimates for this comparator set best met the criteria we set out in the 2013 Guidelines for assessing materials and their relevance/suitability for determining the rate of return. [909] That is, these empirical estimates are:

- Based on available market data and derived with sound, econometric techniques.
- Fit for purpose as they are based on businesses that most closely, albeit imperfectly, meet our definition of the benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services.
- Implemented in accordance with good practice as they are derived from robust, transparent and replicable regression analysis. We note that consistent results are derived from different studies using different econometric techniques and sampling periods.
- 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.
- As a result, we considered empirical studies likely to contribute to a rate of return estimate that achieves the allowed rate of return objective and a source of evidence that should be used as the primary determinant of equity beta.

[909] AER, Better Regulation Explanatory Statement Rate of Return Guideline, December 2013, pp. 23–26, 83-84,

The 2013 Guidelines used Professor Olan Henry's 2014 study to inform our empirical estimates.[910] This report presented empirical estimates on equity beta for a comparator set of nine Australian energy network firms, using available data from 29 May 1992 to 28 June 2013.[911] This report also presented estimates for individual firms as well as various portfolio specifications, and used a range of different estimation methods and time periods. We assessed the equity beta estimates presented in Henry's empirical analysis and concluded that they support a range of 0.4 to 0.7. We also updated Henry's study–using the same methodology–by including data up to 30 April 2017. The results continued to support a range of 0.4–0.7.[912]

We consider that Australian empirical estimates should continue to be the main determinant our equity beta estimate for the following reasons:

- We have observed in regulatory decisions since the 2013 Guidelines that service providers and their consultants have relied on empirical Australian studies to inform the equity beta.[913]
- The ENA has submitted that our standard approach to estimating equity beta from domestic comparators is appropriate.[914] Submissions did not object to the use of empirical Australian estimates.
- Experts have agreed that the overall framework for estimating equity beta is appropriate.[915]
- Partington and Satchell have supported using our empirical estimates for informing the equity beta to be applied in a Sharpe-Lintner CAPM for a benchmark efficient entity with a similar degree of risk as a relevant provider of regulated energy network services.[916]
- They align with our rate of return criteria which we use to assess materials and their relevance/suitability for determining the rate of return.[917]

Updated empirical estimates

We have further updated our 2017 study by including data up to 2 March 2018 for this review.

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910 While Professor Henry's report was published in 2014, estimates were provided to the AER during 2013 to inform the Rate of Return Guideline review. For example, see: AER, Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return, November 2017, pp. 64–67.

911 Henry, *Estimating β: An update*, April 2014, p. 9.

912 In this update, we estimated Ordinary Least Squares (OLS) and Least Absolute Deviation (LAD) estimates of equity beta for our comparator firms just as Professor Henry did in his 2014 study. See AER, staff beta analysis, June 2017.

913 For example see: Frontier, An equity beta estimate for Australian energy network businesses, December 2016; CEG, Replication and extension of Henry's beta analysis, 21 September 2016

914 Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46, 50

915 Cambridge Economic Policy Associates, p. 39

916 Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, 25 May 2018, p. 15.

917 AER, Better Regulation Explanatory Statement Rate of Return Guideline, December 2013, pp. 23–26, 83-84,

We consider the most useful empirical estimates:

- use the Ordinary Least Squares (OLS) estimator (with the Least Absolute Deviation (LAD) estimator used as a robustness check for outliers in the underlying data)
- are measured over multiple estimation periods
- use weekly return intervals (with monthly returns used as a robustness check)
- use the Brealey–Myers formula to de- and re-lever raw[918] estimates to a benchmark gearing of 60 per cent, although we consider both raw and re-levered estimates
- are based on averages of individual firm estimates and fixed weight portfolios (equal weighting and value weighting)
- do not apply a Blume or Vasicek adjustment.[919]

Table 13 set out updated re-levered OLS equity beta estimates for the individual comparator firms (averaged across firms) and fixed weight portfolios[920] respectively. The results show that:

- The re-levered individual firm estimates (averaged across firms) range from 0.57–0.70.
- The re-levered fixed weight portfolio estimates range from 0.43 to 0.85.

[918] Raw equity beta estimates are those that are observed from the initial regression

[919] Henry does not apply a Blume or Vasicek adjustment of any of his estimates, as specified in our terms of reference.

[920] Equally weighted and value weighted portfolios

Table 31 Re-levered weekly equity beta estimates from AER update (OLS, weekly)

		P1	P2	P3	P4	P5	P6	P7
Firms	Avg of firm estimates	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
Equal weighted								
Longest available period	0.57	0.48	0.50	0.54	0.53	0.43	0.47	0.52
Post tech boom & excl. GFC	0.61	0.52	0.51	0.59	0.58	0.50	0.54	0.63
Recent 5 years	0.70	0.71				0.55	0.66	0.79
Value weighted								
Longest available period	n/a	0.52	0.66	0.47	0.47	0.44	0.49	0.54
Post tech boom & excl. GFC)	n/a	0.56	0.67	0.55	0.55	0.52	0.57	0.66
Recent 5 years	n/a	0.73				0.53	0.72	0.85

Source: AER analysis; Bloomberg

Note: Our comparator firms include AusNet Services (AST). This firm was included in the 2013 Guidelines under its former name of SP Ausnet (SPN). It was renamed in 2014.

Henry's report presented LAD (weekly) estimates as a robustness check for outliers in the underlying data. He also presented OLS estimates using monthly return intervals as a robustness check of the estimates using weekly return intervals. We have updated the LAD and OLS monthly estimates and the results are as follows:

- the re-levered LAD estimates range from 0.37–0.91.
- the OLS estimates using monthly return intervals range from 0.46 to 1.14.[921]

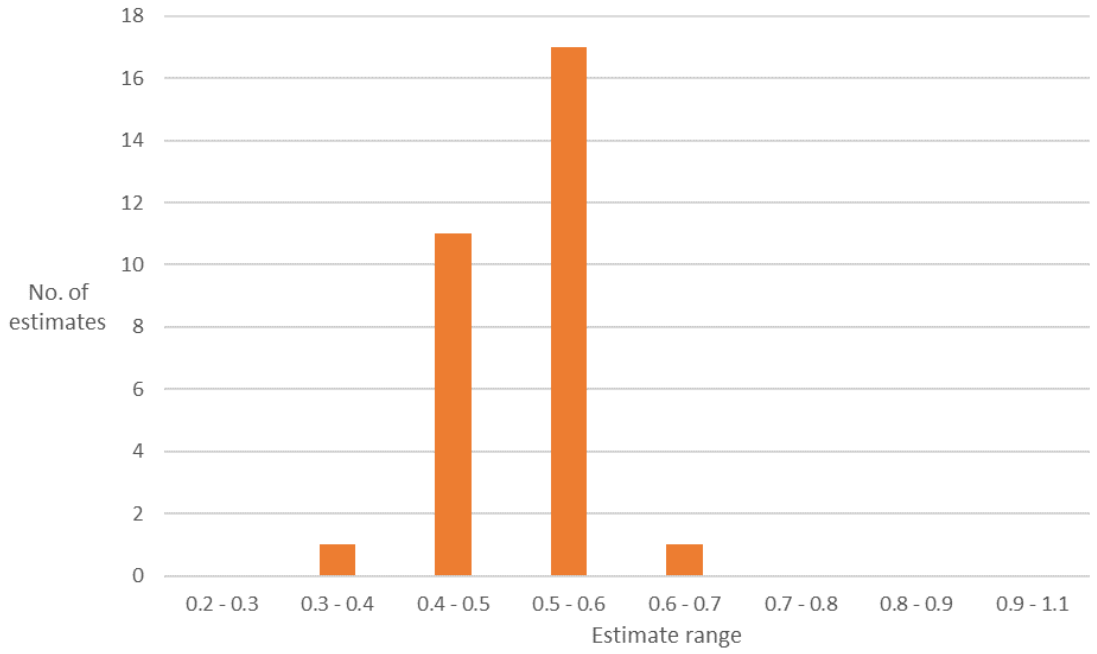
[921] Henry did not present raw estimates for monthly return intervals. Henry also did not present LAD estimates using monthly return intervals. Henry did present time varying portfolio OLS estimates using monthly return intervals, and these estimates range from 0.39 to 0.47. See: *Henry, Estimating β: An update*, April 2014, p. 58. Henry also suggested that the individual firm estimates based on monthly returns be treated with a degree of caution because some estimates are statistically insignificant. See: *Henry, Estimating β: An update*, April 2014, p. 27.

We continue to recognise that there is generally a trade–off in determining the length of the estimation period.[922] On one hand, older data might be considered less reflective of current systematic risk assessments (which would suggest a shorter period). On the other hand, in order to obtain a robust and statistically reliable equity beta estimate we need to have sufficient number of observations (which would suggest a longer period).

We use our empirical analysis to form a range for equity beta which yields a range of 0.4–0.8. We arrive at our range for the following reasons:

- Figure 25 shows that re-levered estimates[923] for the longest estimation period fall in the range 0.4–0.8.

Figure 25 Distribution of 2018 re-levered weekly beta by range (OLS & LAD)



Source: AER analysis, Bloomberg

- All estimates (re-levered weekly portfolio level OLS estimates and averaged firm level estimates) fall within the 0.4–0.8 range except for 1 estimate from Figure 25
- LAD (weekly) estimates are used as a robustness check for outliers in the underlying data. Averaged firm-level estimates (0.51–0.71) are consistent with OLS estimates. Portfolio-level LAD estimates also fall within 0.4–0.8 except for 2 estimates.

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[922] AER, Better Regulation Explanatory Statement Rate of Return Guideline (Appendices), December 2013, p. 49.

[923] Based on OLS and LAD estimates of portfolios and the average of firm-level estimates

We consider the empirical estimates support a point estimate towards the middle of our range.

- We give most weight to the longest estimation period. As observed in Figure 25, most estimates cluster in the 0.5–0.6 range over the longest period.
- The average of weekly re-levered OLS estimates across all periods is 0.57.

Weekly re-levered OLS estimates cluster in the 0.5–0.6 range as observed from

- Table 31.

We give most weight to the longest estimation period because the benchmark gearing ratio has remained at 60 per cent since the 2009 WACC guideline.[924] We also consider that short term estimates can be unduly influenced by factors such as one-off events (for example, the Global Financial Crisis), shocks and interest rate movements (discussed in more detail in section 8.3.9). These factors can obscure the systematic risk of a firm supplying regulated energy services whose exposure is mitigated by regulation and monopoly nature of the service it provides. Submissions from consumers have generally cautioned against reliance on short term estimates of equity beta.[925]

We note there were divergent views on empirical estimates of the equity beta parameter:

- The ENA considered that the inclusion of de-listed firms does not fully reflect increases in equity beta estimates since the 2013 Guidelines.[926]
- The CRG was concerned that the inclusion of some comparator firms may overestimate equity beta because they contain substantial unregulated revenue.[927]

In response, we have estimated equity betas for the still-listed firms and compared them against estimates from the whole comparator set in

[924] AER, Final decision Electricity transmission and distribution network service providers review of the weighted average cost of capital (WACC) parameters, May 2009, p. v.

[925] Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 96; Ian McAuley, Submission to Australian Energy Regulator on rate of return guidelines, December 2017, p. 3; Canegrowers, Submission to AER review of the rate of return guideline, 19 December 2017, p. 4; Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 83.

[926] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 53, 62

[927] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 51.

Table 32.

Table 32 Comparison of estimates for entire comparator set to listed comparators (OLS, weekly)

	Whole comparator set	Still listed firms (APA, SKI, AST)	Still listed majority regulated firms (SKI, AST)
Average of firm level estimates			
Longest	0.57	0.50	0.41
Post tech boom & excl. GFC	0.61	0.59	0.52
Recent 5 years	0.70	0.80	0.68
Fixed weight portfolio estimates			
Longest	0.43–0.66	0.52–0.54	0.42–0.43
Post tech boom & excl. GFC	0.50–0.67	0.63–0.66	0.52–0.53
Recent 5 years	0.53–0.85	0.79–0.85	0.68–0.7

Source: AER analysis, Bloomberg

We consider the still listed firm support our empirical range of 0.4–0.8 and a point estimate towards the middle of this range for the following reasons:

- The range of all estimates for the still listed firms (0.5–0.85) is broadly consistent with our range of 0.4–0.8.
- We place most reliance on the longest estimation period. The corresponding estimates of 0.5 (average of firm estimates) and 0.52–0.54 (portfolio estimates) support our earlier view of a value towards the middle of our empirical range.

We agree with consumer submissions that the inclusion of comparator firms with a high proportion of unregulated activities is likely to result in empirical estimates that are higher than otherwise. This is because the higher level of unregulated activities would increase systematic risk exposure and would not be representative of firms in the supply of the regulated energy services. We consider results from

Table 14 support an equity beta of less than 0.7 and indicates potential for a value less than that from the whole comparator set:

- The average of estimates for SKI and AST[928] is 0.54 across all periods which is consistent with the 2018 update clustering in the 0.5–0.6 range and supports a point estimate towards the middle of the empirical range.
- For the longest estimation period (which we give most weight to), SKI and AST's average firm level estimate is 0.41 and average portfolio estimate of 0.42. These are below estimates from the whole comparator set of 0.57 and 0.50 respectively.
- The average of portfolio estimates and averaged firm estimates for SKI and AST is 0.54 which is below that from the whole comparator set (0.57).

Given concerns with the number of comparator firms in section 0,[929] we have maintained the use of our comparator set. However, we have regard to the above information when selecting a range and point estimate in section 8.3.9.

Comparison to 2013 Guidelines

The 2013 Guidelines considered Henry's empirical analysis supported a range of 0.4–0.7 after considering re-levered OLS equity beta estimates for the individual comparator firms (averaged across firms) and fixed weight portfolios:[930]

- The re-levered individual firm estimates (averaged across firms) range from 0.46 to 0.56. The corresponding raw (that is, observed market gearing level) estimates range from 0.48 to 0.50.[931]
- The re-levered fixed weight portfolio estimates range from 0.39 to 0.70. The corresponding raw estimates range from 0.42 to 0.58.

We also considered that Henry's results indicate a best empirical estimate of approximately 0.5 for the benchmark efficient entity. This was principally because most of the estimates were clustered around 0.5.[932]

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928 Simple average of portfolio estimates and averaged firm-level estimates

929 Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 31; Cheung Kong Infrastructure, AER Issues Paper – Review of the rate of return guideline, 12 December 2017, p. 5; Jemena, Submission on concurrent expert sessions and discussion papers, 4 May 2018, p. 3; Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46, 62.

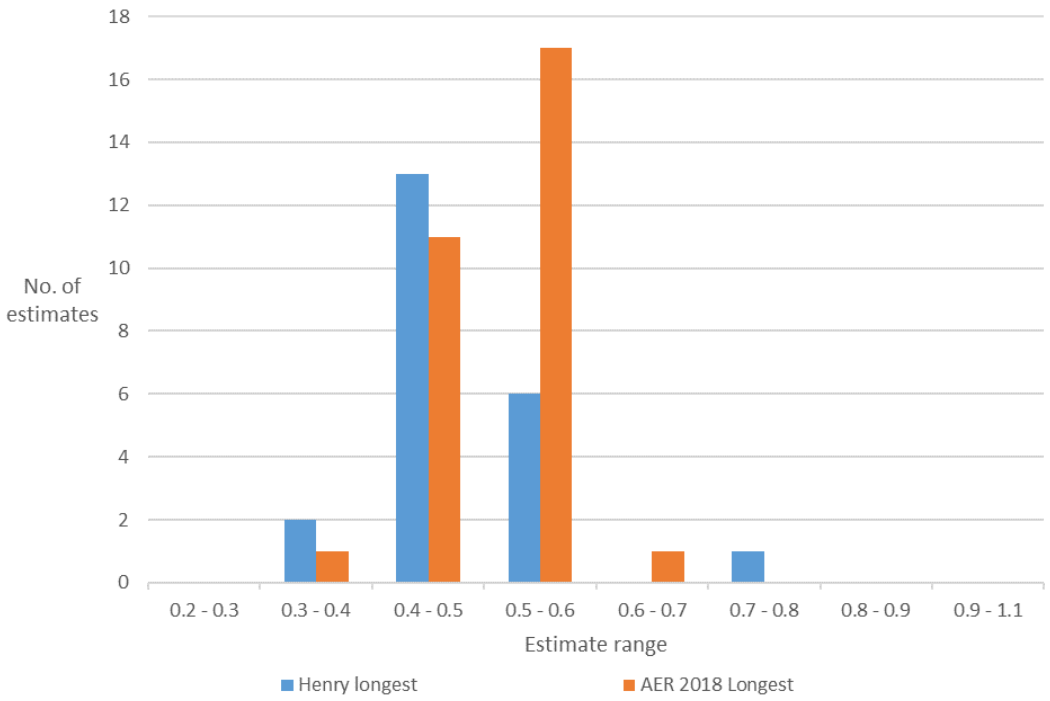
930 For example, see: AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 473–465.

931 The raw equity beta estimates are those that are observed from the initial regression. They have not been de-levered and re-levered to a benchmark gearing of 60 per cent. These estimates are not presented but can be found at: Henry, *Estimating β: An update*, April 2014, pp. 87–89.

932 For example, see: AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 473–465. Based on all averages of individual firm estimates and fixed weight portfolio estimates presented in Henry's 2014 report (95 estimates in total). This includes OLS and LAD estimates, raw and re-levered estimates, weekly and monthly return intervals and all estimation periods.

The figure below compares weekly re-levered equity beta estimates from the 2018 update with Henry's estimates.[933] We observe that estimates have seen some increase and now cluster in the 0.5–0.6 range.

Figure 26 Comparison of weekly re-levered equity beta estimates from Henry's 2014 report (average of individual firm estimates and fixed weight portfolio estimates)



Source: AER analysis, Bloomberg

The tables below compare weekly re-levered equity beta estimates using the longest estimation period (which we give most weight to) for Henry's results and the 2018 update.

Table 33 Comparison of re-levered weekly average firm equity beta estimates (OLS)

	Average of firm-level estimates	
	Henry	2018 update
Longest period	0.52	0.57
PTEG	0.56	0.61

[933] This is based on re-levered weekly OLS and LAD estimates for the following periods: the longest estimation period, post technological boom and excluding GFC and the most recent 5 years. Henry did not estimate portfolio-level values for the most recent 5 year period.

5 years	0.46	0.70

Source: AER analysis, Bloomberg

Note: PTEG is Scenario 2 which is post tech boom excluding GFC

Table 34 Comparison of re-levered weekly portfolio equity beta estimates - longest period (OLS)

	Equal weighted portfolio estimates - Longest period		Value weighted portfolio estimates - Longest period	
	Henry	2018 update	Henry	2018 update
P1	0.46	0.48	0.50	0.52
P2	0.52	0.50	0.70	0.66
P3	0.50	0.54	0.44	0.47
P4	0.48	0.53	0.42	0.47
P5	0.39	0.43	0.39	0.44

Source: AER analysis, Bloomberg

Table 35 Comparison of re-levered weekly portfolio equity beta estimates - PTEG (OLS)

	Equal weighted portfolio estimates - PTEG		Value weighted portfolio estimates - PTEG	
	Henry	2018 update	Henry	2018 update
P1	0.49	0.52	0.54	0.56
P2	0.52	0.51	0.70	0.67
P3	0.55	0.59	0.52	0.55
P4	0.53	0.58	0.50	0.55
P5	0.45	0.50	0.48	0.52

Source: AER analysis, Bloomberg

Note: PTEG is Scenario 2 which is post tech boom excluding GFC

We do observe some increase since 2013:

- The average of firm level estimates have increased since Henry's report with the largest increase for the recent 5 year period (0.46 to 0.70).
- Most portfolio-level estimates rose with the increase being less than 0.05.

However, Table 33 still support an equity beta less than 0.7 as all updated estimates remain below 0.7. Further, estimates from the longest estimation period have shown marginal increases. We give most weight to the longest estimation period because short term estimates may be unduly influenced by one-off events, market volatilities and interest rate movements. See section 8.3.9 for more discussion on how interest rate movements impact empirical beta estimates for our comparator firms.

8.3.3 Comparator firms

To ensure as close a match to the efficient required compensation, we use market data for firms we consider to be reasonably comparable to a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services

During the development of the 2013 Guidelines, nine firms were identified that may be considered as reasonable comparators to a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services. They are ASX listed firms that provide regulated electricity and/or gas network services operating within Australia.[934]

Table 36 Firms in the AER's comparator set

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[935] – present	Electricity, Gas
AusNet Services (AST), formerly SP AusNet (SPN)	December 2005 – present	Electricity, Gas

Source: AER analysis

Suitability of the current comparator set

We have received submissions stating that our comparators are not representative of the benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services:

- The CRG stated that some firms operate both regulated and non-regulated activities–the non-regulated component can be substantial.[936] It concluded that the

[934] For example, see: AER, Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return, November 2017, pp. 64–73; AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 451–463.

[935] The SKI data is available from December 2005, but the data prior to March 2007 reflects stapled securities traded as instalment receipts—these instalments requires further leverage adjustment and makes beta estimation difficult.

[936] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 26, 45.

beta should not be based on unregulated firms and the number of firms that have some match to the benchmark efficient entity (BEE) is limited to just AusNet Services.[937] The MEU also stated that the data is too much compromised by unregulated revenue biasing the measure.[938]

- The APGA noted that the current sample used by the AER has only one still-existing firm that represents the risk faced by the gas businesses (APA).[939] APA and the ENA also noted that there is only gas firm in the sample.[940]
- The CCP 16 submitted that the weight given to the comparators should be reduced as their congruence with characteristics of the BEE reduces.[941] The QCOSS noted that reliance on Australian regulated energy utility information makes the calculated WACC inherently less reliable.[942]

As in the 2013 Guidelines, we consider that, ideally, firms that share all or most of the key characteristics of the benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services would be used when conducting our empirical analysis to estimate the equity beta. However, in practice, few firms would fully reflect this. Therefore we use market data for domestic businesses that are considered to be reasonable comparators to the benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services to inform the equity beta estimate.

Having considered the relevant evidence and submissions, our draft decision is to maintain the existing comparator set for the following reasons:

- The existing comparator firms reflect information from firms that are most comparable to a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services we regulate. This has agreement from the expert concurrent evidence session.[943]
- International energy network estimates and other Australian infrastructure firms possess a range of differences to a service provider in the provision of regulated energy services. We are not persuaded that they should be included in our comparator set or used to inform a point estimate within our range.

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937 CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 45.

938 Major Energy Users Inc, Review of the rate of return guidelines issues paper submission by the Major Energy User Inc, December 2017, p. 12.

939 APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 4.

940 APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 18, ENA, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9.

941 Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 15.

942 Queensland Council of Social Service, Submission on review of Rate of Return Guideline, May 2018, p. 18.

943 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 23, 24, 28

- De-listed firms still carry useful and (historically) reliable information. They provide information on the systematic risk of firms that are most comparable to the firms we regulate. Experts also agreed that they should be included in the comparator set.[944]
- Experts have noted that systematic risk and equity beta (for firms in the provision of regulated energy networks services) are relatively stable and change slowly.[945]We consider this provides additional support for the relevance and inclusion of de-listed firms in the comparator set.
- As observed in Table 36, our comparator set contains firms that provide gas and/or electricity services.
- The expert joint report stated that experts agreed that the weight to place on the estimates should decline in line with the length of the time since delisting.[946]

As noted in section 8.2.1, we consider this was subject to some disagreement. James Hancock considered that 'the case for reducing [de-listed firms'] weight with time since listing has not been made' and better alternatives have not been identified.[947] Further, not all experts were (fully) available over the course of preparing the expert joint report to present their views. The author of the joint statement also confirmed agreed positions may have been taken if no one objected rather than by requiring positive agreement and that assessing the views was not a quantitative voting exercise.[948]

Expanding the comparator set

We received divergent submissions on the topic of expanding the comparator set:

- Service providers stated that the current comparator set should be expanded to include international energy firms and/or other Australian infrastructure firms because the current sample is too small. [949] The ENA noted that as the sample of

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944 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 47

945 Cambridge Economic Policy Associates, Expert Joint Report, April 2018, p. 51.

946 Cambridge Economic Policy Associates, Expert Joint Report, April 2018, p. 47.

947 Cambridge Economic Policy Associates, Expert Joint Report, April 2018, p. 47.

948 See CEPA, *AER RORG Expert Joint Report*, 21 April 2018, p. 11: "It should be noted that not all experts were present in all the sessions and may therefore not have given views on all issues. The issues on which experts contributed were set out above in Section 1.1. Graham Partington (GP) was unavailable due to overseas commitments from 14 April 2018 and provided limited input from that date, but did have sight of the final draft. David Johnstone provided input on drafts until 10 April 2018.
The report indicates when most experts held a particular view. However, assessing the views was not a quantitative voting exercise, but a way of identifying alternative views and the reasons for them. Dissenting views of any expert were considered to be of value and may inform the views of the AER."

949 Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 31; Cheung Kong Infrastructure, AER Issues Paper – Review of the rate of return guideline, 12 December 2017, p. 5; Jemena, Submission on concurrent expert sessions and discussion papers, 4 May 2018, p. 3; Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46, 62.

close domestic comparator reduces, relatively more weight must be given to the other relevant evidence.[950]

- Stephen Gray supported expanding the comparator set to include overseas energy networks and Australian infrastructure firms due to a reduction in the comparator firms. [951]
- The CCP16 opposed expanding the comparator set. They observed that international firms are very poor comparators and the considerable difficulties to adjust additional firms to improve comparability with the benchmark efficient entity.[952]

The expert joint report noted that the range of comparators may be extended but care must be taken to ensure inferences drawn are appropriate.[953] This is consistent with our view that to include additional firms in the comparator set, we must first be satisfied that they bear a sufficiently similar degree of risk as a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services after a careful assessment of their risks, operations, regulatory framework, etc.

This is supported by the Consumer Challenger Panel sub-panel 16 (CCP16) which noted that it is important to investigate the characteristics of any comparator firms as well as the changes in the structures of the existing network firms.[954]

Our view is that the set of comparator firms need to reflect information from firms that are most comparable to a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services. The most relevant data for estimating equity beta comes from domestic energy network firms.

This has agreement from the ENA and experts:

- Stephen Gray acknowledged that the remaining domestic firms are most relevant[955]
- Ilan Sadeh noted that domestic energy network firms are the most comparable.[956]
- The ENA observed that the best available evidence is from domestic NSPs and that this evidence should receive material weight.[957]

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950 Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9

951 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 23.

952 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 82

953 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 44.

954 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

955 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 28

956 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 23

- This is supported by the ECA which noted that it 'remains unclear how when the benchmark efficient entity is an Australian entity international estimates would have any relevance'.[958] The CCP16 also cautioned the inclusion of international estimates and other Australian infrastructure firms if the new data is not particularly relevant to the benchmark efficient entity.[959]

Stephen Gray and Simon Wheatley submitted that expanding the comparator set to include international energy firms and other Australian infrastructure firms would improve statistical reliability.[960] QCOSS submitted that the problem is that the equity beta is set based on an unavoidably narrow comparator group and can easily be distorted by a few data points. [961]

We consider that, as noted by APA, it is necessary to weigh up the potential statistical improvement from expanding the comparator set against the suitability of the additional firms.[962]

We consider that a small set of comparators does not necessarily justify expanding the comparator set in itself. If the additional firms do not carry a similar degree of risk or cannot be appropriately adjusted to be comparable to a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services then they can bias estimates.

Experts and submissions have also noted that a small sample for firms does not necessarily require expanding the comparator set:

- Partington and Satchell's previous advice indicate that it would be preferable to use a small sample of comparable firms instead of a larger sample of firms with different risks to that of a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services.[963]
- The NSG noted that a 'narrow set of firms is of itself an [insufficient] rationale to include additional comparators'.[964]
- Graham Partington and Ilan Sadeh disagreed with expanding the comparator set.[965]

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957 Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 62.

958 Energy Consumers Australia, Review of the rate of return guideline response to the AER Issues Paper, December 2017, p. 23.

959 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70.

960 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 44.

961 Queensland Council of Social Service, Submission on review of Rate of Return Guideline, May 2018, p. 18

962 Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 62.

963 Partington and Satchell, Report to the AER: discussion of comparator firms for estimating beta, June 2016, p. 9.

964 Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 15.

Further, we observe in the section below that international energy and other Australian infrastructure firms differ from a supplier of regulated energy services and so do not provide much useful information on the systematic risk (as captured by the equity beta) of firms supplying the regulated energy network services. The CCP16 has also noted that neither the international data nor the data on Australian infrastructure stocks make suitable comparator data due to differences between these stocks and the characteristics of the BEE.[966]

We note James Hancock stated that international and other Australian infrastructure firms should be included only if it can be shown that they provide useful information about the equity of Australian regulated network service providers.[967] However, we have not received evidence to persuade us that these firms have similar degree of risk as a benchmark efficient entity with a similar degree of risk as a relevant service provider in in the provision of regulated energy network services.

International energy firms

Given the absence of substantively new information to justify the use of international energy firms, we remain of the view that they should not be included in our comparator set for the following reasons:

- International energy firms deviate from our view of a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services because they do not operate within Australia. Differences in regulation of businesses, the domestic economy, geography, business cycles and a number of different factors are likely to result in differences between equity beta estimates for similar businesses between countries.[968] It is difficult to assign quantitative impacts to these qualitative factors. Partington and Satchell have also identified a range of difficulties in interpreting different betas from different countries including differing systems of utility regulation, different technologies and operating conditions, different energy market conditions, and differing leverage. Differing levels of leverage suggest fundamental differences in the nature of the businesses and/or the environment they operate in.[969]

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965 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 44.

966 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 68

967 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 45.

968 This is supported by Partington and Satchell. See Partington and Satchell, *Report to the AER: Cost of equity issues 2016 electricity and gas determinations*, April 2016, p. 11. They stated, 'Considerable caution in reaching conclusions about beta needs to be exercised when the comparators are drawn from overseas countries. This is because of differences in industry structure, technology, the nature of competition, the economic environment and regulatory and tax systems'.

969 Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, 25 May 2018, p. 24

- We discuss equity beta estimates in the context of our foundation model, which is the domestic Sharpe-Lintner CAPM.[970] This provides a strong rationale for estimating the equity beta using Australian data. If we included international energy firms in our comparator set, it may be more appropriate to use an international or global CAPM.[971]
- Equity beta estimates from international comparators are measured with respect to the market portfolio of their home market.[972] This means the equity beta estimates from international comparators are not a measurement of the firm's systematic risk relative to the Australian domestic market portfolio.[973]
- They may not have the same structure as Australian energy network firms. For example, a number of US comparator businesses identified by the Competition Economists Group (CEG) are vertically integrated.[974] They engage in energy generation, wholesale and retail supply of energy, as well as other activities distinct from energy distribution and transmission. Some of the firms even engage in telecommunications, real estate development and manufacturing activities.[975] These activities are very different from our definition of a benchmark efficient entity, which is a pure play energy network business (operating within Australia) with a similar degree of risk as a provider of regulated energy services. As noted in the Guideline, we consider vertically integrated firms tend to have higher equity beta estimates than pure play energy network firms.[976]
- Partington and Satchell have also advised against the inclusion of international energy firms.[977]

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970 We implement the Sharpe-Lintner CAPM under the assumption of a domestic market, but with a presence of foreign investors. This allows us to recognise that foreign investors cannot utilise imputation credits. However, the benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services operates in the Australian market by definition, and we estimate the MRP in the context of the Australian market portfolio.

971 See Handley, *Advice on the return on equity*, October 2014, p. 24; Partington and Satchell, *Report to the AER: Cost of equity issues 2016 electricity and gas determinations*, April 2016, p. 16.

972 This is the case unless the equity betas are estimated using an international CAPM framework.

973 This is supported by Handley and Partington and Satchell. See Handley, *Advice on the return on equity*, October 2014, pp. 23–24; Partington and Satchell, *Report to the AER: Cost of equity issues 2016 electricity and gas determinations*, April 2016, p. 16. In his May 2015 report, Handley concluded that he does not consider it necessary to change any of the findings in his earlier (2014) report. See: Handley, *Advice on the rate of return for the 2015 AER energy network determination for Jemena Gas Networks*, 20 May 2015, p. 28.

974 CEG describes vertically integrated US energy utility firms as 'common among [its] sample'. See: CEG, *Information on equity beta from US companies*, June 2013, p. 20.

975 CEG, *Information on equity beta from US companies*, June 2013, pp. 47–68.

976 In the rate of return guideline, we found the average equity beta of 56 US energy utilities (identified by CEG) was greater than the average equity beta of 18 US utilities identified by ACG as 'almost exclusively electricity and/or gas distribution and transmission businesses'. See: AER, *Explanatory statement to the rate of return guideline (appendices)*, December 2013, pp. 62–63. Also see: ACG, *Beta for regulated electricity transmission and distribution: Report to Energy Network Association, Grid Australia and APIA*, September 2008, p. 18; CEG, *Information on equity beta from US companies*, June 2013; SFG, *Regression-based estimates of risk parameters*, June 2013, p. 19.

977 Partington and Satchell, Report to the AER: discussion of comparator firms for estimating beta, June 2016, p. 15.

Stakeholder submissions have also acknowledged the limitations of using international data for informing the equity beta:

- APA acknowledged that the use of international data and other Australian infrastructure firms may increase statistical precision, but at the cost of biased estimates of equity beta.[978] It noted that there is no simple mathematical adjustment which might be applied to those international data to make them comparable with data from the extant domestic comparators.[979]
- The CCP16 noted that there are considerable difficulties in 'normalising' these firms for better comparability with the benchmark efficient entity.[980]
- The ENA has acknowledged international firms operate in different markets compared to the benchmark efficient entity we regulate.[981]

Further, experts have acknowledged difficulties with using international firms to estimate equity beta:

- Experts noted that using international energy firms would be problematic (for example due to different regulatory frameworks and systematic risks)[982] and foremost weight should be placed on domestic comparators because they are the most relevant.[983]
- Ilan Sadeh noted that market practitioners use international estimates as a cross check. [984]
- Experts have agreed that no simple mathematical adjustment exists to allow appropriate consideration of international data.[985]

The above information does not imply that the empirical evidence based on international energy network firms should be discarded completely. Rather, we consider that such evidence may have some use in informing the equity beta point estimate in a cross-checking role which is discussed in section 8.3.4.

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978 APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, pp. 18–19.

979 APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 19

980 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

981 Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 62

982 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 33, 29, 28

983 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 28, 33, 35

984 AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 28

985 Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 46.

Other Australian infrastructure firms

We have considered the divergent submissions on including other Australian infrastructure firms in the comparator set. Material submitted to us proposing the use of these firms was generally in the context of the reduction in the existing comparator firms.

We note Stephen Satchell stated that the use of other Australian infrastructure firms depends on whether these companies are fundamentally similar.[986]

Our assessment is that the risk characteristics of these businesses are different to those of a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services (for example, due to demand risk, different (or no) regulatory framework, etc.) in the provision of regulated energy network services.

Others have made similar observations:

- The CCP observed Ilan Sadeh noted that domestic infrastructure businesses are very poor comparators to include in the estimation of the equity beta for the BEE, because of their different approaches to debt, other funding arrangements and private ownership (among other things). [987]
- The NSG observed that domestic infrastructure firms from other sectors are of very limited value due to different regulatory environments and capital requirements. [988]
- The CCP16 stated that there are considerable difficulties in normalising domestic infrastructure equity betas to achieve better comparability with the BEE. [989]

Further, we have not been provided with sufficient evidence to persuade us that other Australian infrastructure firms carry a sufficiently similar degree of risk as a benchmark efficient entity. Ilan Sadeh also appears to caution that it would be 'most [dangerous]' to look at other Australian infrastructure firms. [990]

Therefore, we do not consider that other Australian infrastructure firms should be included in our comparator set.

We disagree with APA's statement that domestic infrastructure firms operate in the Australian market in an industry that is close to, but not exactly equivalent to, the provision of energy network services.[991]

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[986] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 26

[987] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 82

[988] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 15.

[989] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 81.

[990] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 33.

[991] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 62

Use of de-listed firms

We note CKI and the ENA have proposed excluding de-listed firms from the comparator set because they do not reflect prevailing market conditions.[992] [993] [994]

However, experts agreed that de-listed firms should be included in the comparator set but held divergent views on the weight given to them:

Jim Hancock noted that de-listed firms should not be dismissed because, to the extent the betas changed, they are probably cycling.[995] He added that we should be hesitant to put less weight on de-listed firms as that increases weight on others which raise the question if there are better alternatives. Further, if estimates cycle up and down then historical can still give a reasonable estimate of long run average[996]

Stephen Satchell advised that to disregard information that at least is historically reliable could only be justified if we could find something better and there does not seem to be better information.[997]

Stephen Gray stated that de-listed firms have their beta frozen in time and averaging across estimates will be misleading if most of the firms are de-listed and the remaining firms suggest a material increase recently[998]

We have considered the proposal to exclude de-listed firms. We recognise that they may not necessarily provide the most up-to-date information about the equity beta. However, they still provide (historically) reliable and accurate information on the systematic risk of a BEE with a similar degree of risk as a relevant service provider in the provision of regulated energy services. Neither could be said with certainty for international energy firms and other Australian infrastructure firms from discussions in the above sections. Any adjustments to these firms also appears problematic due to issues quantifying differences with a supplier of the regulated energy services.

Further, Partington and Satchell continue to support the use of de-listed firms in their latest advice as 'beta has been stable through time and therefore historic estimates of beta, including from companies that are now delisted, can be used to inform current estimates'.[999]

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[992] Cheung Kong Infrastructure, AER Issues Paper – Review of the rate of return guideline, 12 December 2017, p. 5.

[993] Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 31.

[994] Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 62.

[995] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 24

[996] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 25

[997] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 25

[998] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 24–25

[999] Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, 25 May 2018, p. 25; Partington and Satchell, Report to the AER: discussion of comparator firms for estimating beta, June 2016, p. 9..

Experts at the concurrent expert evidence session also agreed that equity beta is relatively stable because the true systematic risk is likely to be stable.[1000] We consider this supports the inclusion of de-listed firms which should still provide useful information for informing the equity beta parameter.

8.3.4 International comparators

In the 2013 Guidelines, we considered that international estimates may be used to inform a point estimate within our empirical range. This is because we considered that international comparators are less aligned with a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services compared to Australian comparators.[1001]

Submissions and information from this review process has pushed us to further consider the weight to international comparators:

- Stephen Satchell has advised that 'it is not clear that a cross section of betas in one market is directly comparable with those from another market'.[1002]
- Ilan Sadeh noted that assessment would be more qualitative if the evidence is not domestic Australian firms.[1003]
- Stephen Gray noted that other regulators' estimates can provide information on how they have made inferences in the context of limited listed comparators[1004]
- Service providers and networks associations have pushed for more weight to international comparators as noted in section 0.

We remain of the view that it would be difficult to use international comparators in accordance with good practice for estimating the equity beta parameter.[1005] The multitude of differences observed in section 0 with a supplier of the regulated energy services also means that we cannot (reliably) quantify and adjust international estimates to make them comparable to domestic estimates which are the most suitable comparators.

If we cannot reliably quantify and adjust for these differences, then it would not be appropriate to use this material inform a point estimate from the empirical range. Therefore, we do not consider it appropriate to retain international comparators in its current role.

[1000] Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 51.

[1001] AER, Better Regulation Explanatory Statement Rate of Return Guideline, December 2013, p. 85.

[1002] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 26

[1003] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 33

[1004] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 45.

[1005] AER, Better Regulation Explanatory Statement Rate of Return Guideline, December 2013, p. 85.

However, we consider international comparators can still provide some information on the systematic risk of a firm. This will necessarily be in a qualitative role, similar to conceptual analysis, because both are unable to provide information on a supplier of the regulated energy services that can be (reliably) quantified.

Empirical international estimates

The most recent empirical study we received on international energy firms was from a 2016 Frontier report.[1006] It estimated equity beta for 56 US-listed energy network companies over a 20 year period from December 1995 to December 2015. The sample was originally compiled by CEG in 2013 and was based on firms where at least 50 per cent of the revenue was regulated.[1007]

We have used the set of firms from the 2016 Frontier report to inform international empirical estimates of equity beta while recognising differences with the firms we regulate in section 0.

The figure below summarises the range of results of our OLS results using quartile estimates.[1008] The figure uses a box and whiskers chart to present the minimum, 1st quartile, 3rd quartile and maximum from the results.

We make the following observations:

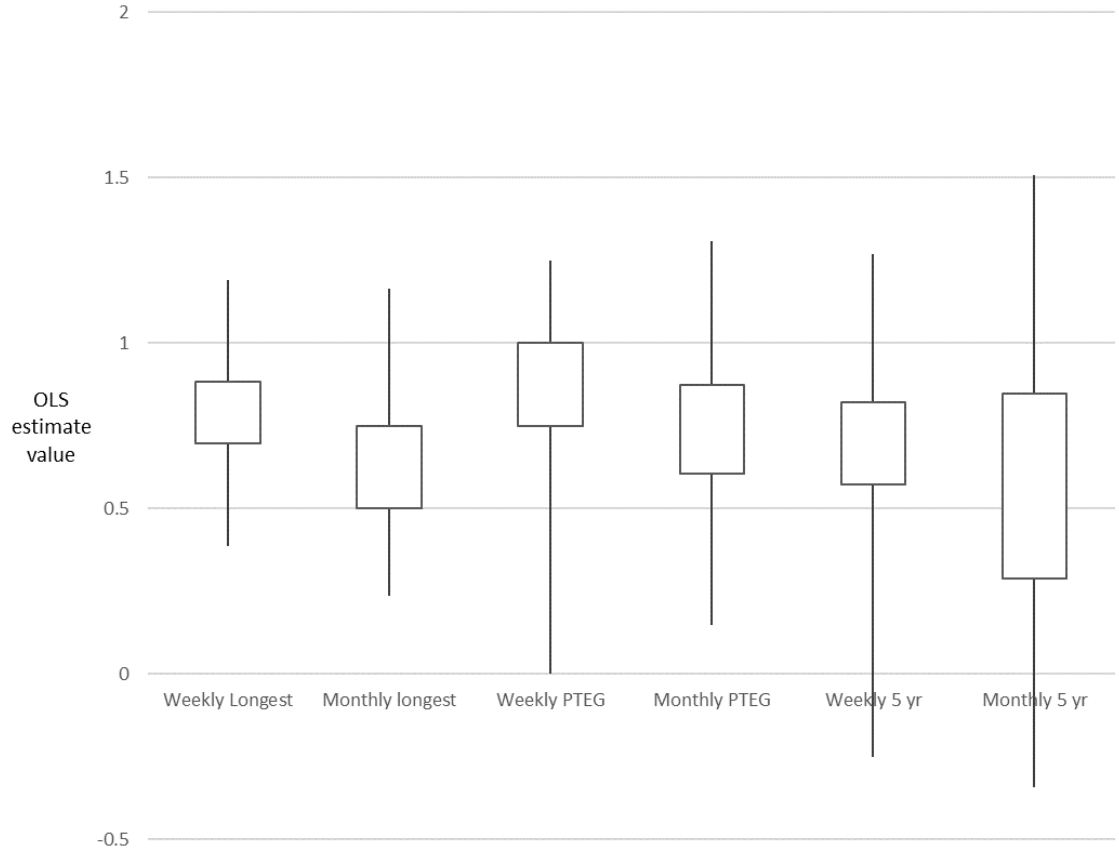
- Estimates, across all estimation periods, cluster below 1.0.
- Estimates for the longest period (which we give most weight to when considering the empirical range) cluster below 1.0.

[1006] Frontier, Estimating the equity beta for the benchmark efficient entity, January 2016.

[1007] SFG, Regression-based estimates of risk parameters, June 2013, pp. 15, 19; CEG, Information on equity beta from US companies, June 2013.

[1008] Quartiles are the values that divides a list of numbers into quarters. The first quartile is the data point in a data set that separates the bottom 25 per cent of data points from the top 75 per cent. The second quartile is the data point in a data set that separates the data in half. The third quartile is the data point in a data set that separates the bottom 75 per cent of data points from the top 25 per cent.

Figure 27 Summary of international estimates[1009]



Source: AER analysis; Bloomberg

Note: This 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 indicate 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.
PTEG is Scenario 2 which is post tech boom excluding GFC.

Service providers and network associations have noted the NZCC's estimation of international estimates in 2016. We note there is significant overlap between the comparator sets from SFG and the NZCC. However the NZCC's selection methodology may lead to firms with minority regulated operations being included in its comparator set.[1010] This is because selection appears to be based on Bloomberg's description of businesses' operations as 'electricity', 'gas distribution', 'pipelines' and 'multiutilities'. Therefore, we use the sample of 56 US energy firms.

[1009] This figure shows the quartile distribution of estimates. The top of the top line indicate 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 is represents the third quartile.

[1010] NZCC, Input methodologies review decisions Topic paper 4: Cost of capital issues, 20 December 2016, p. 63.

8.3.5 Black CAPM and low beta bias

In the 2013 Guidelines and subsequent regulatory decisions, we used the theory of the Black CAPM (to account for potential market imperfections that may cause actual returns to diverge from expected returns) to select a point estimate towards the upper end of our empirical range.

This was because there are a range of limitations with the model, such as empirical instability and implementation,[1011] and while the direction of its effect may be known, the magnitude is much more difficult to ascertain.

However, we acknowledged that it can provide some information in selecting the equity beta point estimate towards the upper end of our empirical range.[1012] Therefore, the theory of the Black CAPM was used (to account for potential market imperfections) to select a point estimate towards the upper bound of our empirical range in the 2013 Guidelines and subsequent regulatory decisions.[1013]

Low beta bias

We first note that the Black CAPM and the low beta bias are two different concepts and need to be distinguished:

- The Black CAPM is an alternative model to the Sharpe-Lintner CAPM. The key theoretical difference between the Black CAPM and the Sharpe-Lintner CAPM relates to borrowing and lending assumptions.[1014] As a result of slightly different starting assumptions, the Black CAPM predicts a slope of estimated returns that can be flatter than for the Sharpe-Lintner CAPM.[1015]

[1011] AER, Better Regulation Explanatory Statement Rate of Return Guideline (appendices), December 2013, pp. 71-72.

[1012] In the Guideline we performed a rough assessment of the reasonableness of the option to select a point estimate towards the upper end of the equity beta range (to reflect the differing predictions of the Black CAPM relative to the SLCAPM). We noted for clarity that we do not consider the possible zero beta premiums presented in table C.11 of the explanatory statement to the Guideline are accurate or reliable as empirical estimates because we do not consider that there is any reliable empirical estimate for this parameter. However, in light of the available evidence, if the Black CAPM captured the 'true' state of the world better than any other asset pricing model (although we are not implying that it does), selecting a point estimate towards the upper end of the equity beta range appeared open to us. See: AER, *Explanatory statement to the rate of return guideline (appendices)*, December 2013, pp. 70–71.

[1013] For example, see: AER, Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return, November 2017, pp. 64–73;

[1014] The Sharpe-Lintner CAPM assumes that investors can access unlimited borrowing and lending at the risk free rate. The Black CAPM relaxes this assumption, and instead assumes that investors can access unlimited short selling of stocks, with the proceeds immediately available for investment. Either of these assumptions might correctly be criticised as being unrealistic, and it is not clear which assumption is preferable.

[1015] Fischer Black's 1972 paper on the Black CAPM develops two model specifications. The base specification assumes no risk free asset exists (no risk free borrowing or lending). The second specification assumes that the representative investor can lend but not borrow at the risk free rate. In the base specification, the return on the zero beta portfolio can be above the risk free rate. In the second specification, the return on the zero beta portfolio must be above the risk free rate. See: Black, *Capital market equilibrium with restricted borrowing*, Journal of Business 45(3), July 1972, pp. 452–454.

- The low beta bias is an observation that ex-post returns from low beta stocks tend to outperform expected returns.

Experts also appear to recognise the difference as they do not confuse the low beta bias with the Black CAPM.[1016]

Submissions from network businesses, investors and networks associations propose adjusting the return on equity for the low beta bias.[1017] [1018] [1019] [1020] Some of these submissions supported more (and explicit) adjustments for the low beta bias.[1021] The CCP16 did not consider the low beta bias to be particularly suitable for estimating ex-ante the equity beta or for 'adjustment' to the empirical data.[1022] It noted that it is based on ex-post empirical assessment of actual outturns which is not an unbiased estimate of ex-ante expectations

We note submissions in support of adjusting the return on equity for low beta bias do not provide substantively new information from those considered in our 2013 Guidelines and subsequent regulatory decisions. That is, they revolve around observations of the low beta bias on an ex-post basis[1023] which needs to be factored into the ex-ante rate of return through an adjustment of some sort. [1024] [1025] [1026] Stephen Gray also stated that the adjustment should offset the low beta bias.[1027]

[1016] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 53.

[1017] Australian Pipeline and Gas Association, Submission to the Issues Paper: AER review of the rate of return guideline, 12 December 2017, p. 9; Cheung Kong Infrastructure, AER Issues Paper – Review of the rate of return guideline, 12 December 2017, p. 5; Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 31; Ergon Energy and Energex, AER Issues paper review of the rate of return guidelines Ergon Energy and Energex submission, 12 December 2017, p. 6; Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 59; Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 58.

[1018] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9.

[1019] SAPN, Victorian Power Networks, Australian Gas Infrastructure Group, AER Discussion Papers – Review of the Rate of Return Guideline, 4 May 2018, p. 6.

[1020] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 15.

[1021] Evoenergy, Review of rate of return guideline –evidence sessions, 4 May 2018, p. 3; APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018; Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9.

[1022] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

[1023] By comparing actual realised returns against expected returns.

[1024] For example, APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.

[1025] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 27.

[1026] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 52.

[1027] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 53.

We acknowledge that ex-post return data can indicate that actual returns exceed expected returns for low beta stocks.

However, given the lack of substantively new material, our considerations for giving no weight to low beta bias in our 2013 Guidelines and subsequent regulatory decisions also remain relevant:

- Many of the tests and exercises which indicate low beta bias are themselves the subject of ongoing academic debate and carry limitations which throw doubt on their results and suitability for our regulatory task[1028]
- There are a number of explanations (for example, economic conditions) that do not imply a bias in equity beta.[1029] For example, Partington and Satchell have previously observed that beta for a given portfolio remains remarkably constant which suggest that it may not be bias in beta that explains non-zero alphas, but that it has more to do with economic conditions.[1030]

It is also not clear that the low beta bias exists on an ex-ante basis or is accounted for by investors and market practitioners on the same ex-ante basis:

- It cannot be proven or quantified on an ex ante basis.[1031] Partington and Satchell have previously advised that a myriad of factors can contribute to actual returns differing from expected returns.[1032]
- Our analysis of broker reports and expert valuation reports shows that very few reports (if any) adjust the rate of return for the low beta bias. This indicates that market practitioners and investors do not appear to account for the low beta bias when estimating the required rate of return.
- Partington and Satchell have advised that the empirical ex-post results does not necessarily imply low beta bias or that the bias should warrant increasing the allowed rate of return.[1033] This is because an increase in beta estimates may be driven by factors that may not necessarily reflect a change in the systematic risk of supplying the regulated energy services. Partington and Satchell have noted that interest rate movements, over pricing of high beta stocks and a low beta[1034] can all drive increase in estimates.[1035] [1036]

[1028] AER, 2013 Guidelines appendices, December 2013, pp. 11–12; For example, AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 451–463, p. 288.

[1029] For example, AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 451–463, p. 285

[1030] Partington and Satchell, *Report to the AER: Return of equity and comment on submissions in relation to JGN*, May 2015, p. 16

[1031] AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 451–463, p. 288.

[1032] Partington and Satchell, *Report to the AER: Discussion of submissions on the cost of equity*, 8 June 2017, p. 30.

[1033] Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, 25 May 2018, p. 26–28.

[1034] Partington and Satchell observed that a low beta is correlated with high alpha

[1035] Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, 25 May 2018, p. 26–28.

[1036] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 53.

- APA also acknowledged that the observed low beta bias may be a consequence of the model correctly estimating expected returns which are then being compared against – different – realized returns
- Experts and submissions in support of including the low beta bias generally noted the low beta bias is observed in ex-post data, textbooks and academic research.[1037] However, they did not advance evidence that the low beta bias is factored in or that investors and market practitioners account for it on an ex-ante basis.
- Ilan Sadeh stated that it is hard to explain the low beta bias and noted actual returns may include an 'alpha' for expected outperformance on items such as incentive schemes because empirically listed network stocks have benchmarked more efficient than average.[1038] He also noted that the rate of return is for the return on RAB and returns higher than that set by the AER is attributable to the (extra) risk borne on items such as opex allowance.[1039]
- The CCP16 noted the low beta bias is based on ex-post empirical assessment of actual outturns which is not an unbiased estimate of ex-ante expectations. [1040]

Based on the considerations above, our draft decision is to continue give no weight to the low beta bias. The APA has also acknowledged that estimates of beta are not, themselves, biased.[1041]

We note two submissions appear to state that the AER sought to correct the low beta bias by giving weight to the Black CAPM.[1042] [1043] [1044] We disagree. We gave a role to the theory of the Black CAPM in the 2013 Guidelines to capture possible market imperfections that may lead to actual returns to differ from expected returns. We did not, and do not, give weight to low beta bias.

[1037] For example, see: APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p.9.; Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 58.

[1038] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 53.

[1039] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 46.

[1040] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70.

[1041] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 24.

[1042] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 59

[1043] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 25.

[1044] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 26.

In its April 2018 report for AusGrid, Frontier submitted that the AER's adjustment does not fully correct the low beta bias.[1045] After reviewing this material, we consider that it is substantively the same as a January 2017 Frontier report titled 'low-beta bias'.[1046]

Both reviewed selected academic papers and previous consultant reports on the Sharpe-Lintner CAPM's low beta bias to conclude that the AER should set a beta higher than 0.7 to 'better' correct this bias. Both also raised issues we have considered in previous regulatory decisions and our (previous) consideration of these issues remain relevant for informing this decision. As a result, we consider our reasons for rejecting the January 2017 report appropriate for informing our rejection of the April 2018 material:

- The reviewed academic papers and consultant reports generally conduct or refer to empirical tests of asset model performance to test for the bias.[1047] We have consistently noted a range of issues with these tests which cast doubt on this source of material and its suitability for informing the required return on equity.[1048] For example, results of asset model tests can depend on how the tests are designed and has been observed to indicate 'more about the shocks to the expected returns (volatility) rather than the equilibrium expected returns'.[1049]
- Frontier noted that the Black CAPM or an equivalent equity beta adjustment can be used to correct the low beta bias.[1050] We note Frontier's equity beta adjustment hinges on output from the Black CAPM.[1051] We have consistently noted that there are a range of issues with implementing the Black CAPM[1052] and there is little evidence that other regulators, academics or market practitioners use the Black CAPM to estimate the return on equity.
- Frontier has mischaracterised our approach for equity beta.[1053] We did not uplift the equity beta to 0.7 (from 0.5) to account for the low beta bias.[1054] We selected 0.7 (from a range of 0.4–0.7) to account for the theory of the Black CAPM (to account for potential market imperfections) and other relevant information. [1055]

The APGA has submitted extensively on the topic of low beta bias which we respond to in the table below.

[1045] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 37–64.

[1046] Frontier, *Low beta bias*, January 2017.

[1047] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 41–49, 59–63.

[1048] AER, *Draft decision Multinet Gas Access Arrangement 2018–2022 Attachment 3–Rate of return*, July 2017, pp. 179–187.

[1049] AER, *Draft decision Multinet Gas Access Arrangement 2018–2022 Attachment 3–Rate of return*, July 2017, pp. 180.

[1050] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 38.

[1051] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 51–54, 64.

[1052] For example, the zero-beta return is unobservable and there is no apparent consensus on methods for estimating this return. AER, *Draft decision Multinet Gas Access Arrangement 2018–2022 Attachment 3–Rate of return*, July 2017, pp. 188–201.

[1053] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 55–56.

[1054] AER, Better Regulation Explanatory Statement Rate of Return Guideline, December 2013, p. 86.

[1055] AER, Better Regulation Explanatory Statement Rate of Return Guideline, December 2013, p. 86.

Table 37 Consideration of APGA submission on low beta bias

Submission	Consideration
Experts were in unanimous agreement on the existence of low beta bias and 'ignoring' it due to concerns with the empirical reliability of the Black CAPM would not be prudent.[1056]	We first note that we do not use the theory of the Black CAPM to account for the low beta bias. We did not, and do not, give weight to the low beta bias. Second, we have outlined a range of concerns with the Black CAPM such as lack of real-world use, empirical implementation, divergent results etc.[1057] We consider that if a model cannot meet our assessment criteria well then we have reservations regarding its use. Further consideration of the Black CAPM in this review has reinforced these concerns.
AER risk unbalanced treatment of evidence if it adopts Stephen Satchell's advice on interest rate movements when it rejected the Fama French Model.[1058]	We consider all submissions, materials and evidence on their strengths, weaknesses and suitability for our regulatory task.
Ignoring actual returns entirely because actual returns are different to expectations … does not appear to be an adequate response.[1059] It noted that the 'usual' way to address the problem the AER faces in respect of the low beta bias is to use actual returns to adjust models like the CAPM.[1060]	We need to consider what is causing actual returns to differ from expectations and if these factors are priced by investors on an ex-ante basis. Partington and Satchell have noted that this could be due to economic shocks, business cycle and other factors in their previous advice.[1061] Broker and valuation reports also do not appear to adjust for the low beta bias. Therefore, it is not clear to us that the historical outperformance necessarily warrant adjustment to the expected rate of return.
The AER should consider the empirical results of low beta bias (even if they can be wide ranging) instead of using judgement or theory.[1062] The APGA noted that best approach we have seen in the Australian regulatory context is that undertaken by HoustonKemp for Multinet in its most recent proposal.[1063]	As noted above, it is not clear that the low beta bias exists on an ex-ante basis or is accounted for by investors and market practitioners on the same ex-ante basis. Further, we disagree with the use of ex-post data for a number of reasons including interest rate movements and economic shocks can all lead to ex-post returns diverging from expected returns.
Disregarding the low beta bias would decrease investor returns which may deter investment and would not be in the long run interests of consumers.[1064]	As noted above, investors do not appear to factor in the low beta bias when forming their investment decisions.

[1056] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 8.
[1057] For example, see AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 451–463, p. 79, 309–315.
[1058] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1059] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1060] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1061] Partington and Satchell, Report to the AER: Discussion of submissions on the cost of equity, 8 June 2017, pp. 29–30.
[1062] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1063] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1064] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 7.

Submission	Consideration
The Guideline should examine and account for the low beta bias as it has been observed in practice and academic research.[1065]	We recognise that there is evidence of ex-post returns of low beta stocks outperforming expected returns. However, we have to consider this in the context of setting a forward looking, ex-ante rate of return that compensates for the efficient financing cost of a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services. As noted, investors and market practitioners do not appear to account for the low beta bias on an ex-ante basis. Actual returns can deviate from expected returns for a range of reasons including shocks to the economy. This was also noted by Partington and Satchell in their previous advice.[1066]

Black CAPM

We note that we gave a role to the theory of the Black CAPM in the 2013 Guidelines to capture potential imperfections in the market that may cause actual returns to differ from expected returns.[1067]

There were divergent submissions on the Black CAPM.

Submissions from network businesses, investors and networks associations propose the continued use of the Black CAPM[1068]. Some of these submissions supported maintaining the weight given to the Black CAPM.[1069]

Submissions from consumer groups generally opposed having regard to the Black CAPM.[1070] The CCP16 did not consider the Black CAPM to be particularly suitable for estimating ex-ante the equity beta or for 'adjustment' to the empirical data.[1071] It noted that it based on ex-post empirical assessment of actual outturns which is not an unbiased estimate of ex-ante expectations. Moreover, it noted significant variability in the zero beta estimates, a variability that is consistent with the fact that neither the market practitioners nor regulators generally use this estimate.

We have further considered the Black CAPM.

We note submissions have not raised substantively new material to those considered in the 2013 Guidelines and subsequent regulatory decisions. As a result, we continue

[1065] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.

[1066] Partington and Satchell, Report to the AER: Discussion of submissions on the cost of equity, 8 June 2017, pp. 29–32.

[1067] AER, Better Regulation Explanatory Statement Rate of Return Guideline, December 2013, p. 86.

[1068] ATCO gas, Re: Review of rate of return guideline-issues paper, 12 December 2017, p. 8–9; Network Shareholder Group, Re: Response to issues paper on the review of the rate of return guideline, 12 December 2017, pp. 9-10; APA, Review of the rate of return guidelines APA submission responding to AER issues paper, 12 December 2017, p. 11.

[1069] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9.

[1070] Energy Consumers Australia, Review of the rate of return guideline response to the AER Issues Paper, December 2017, p. 23; Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 85, 89;

[1071] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

to note the shortcomings of the Black CAPM identified in the 2013 Guidelines. For example:

- The model is not empirically reliable.[1072]
- The model is not widely used to estimate the return on equity by equity investors, academics or regulators.[1073]
- The model does not meet our assessment criteria well[1074]

These shortcomings have been reinforced by material and evidence received since the 2013 Guidelines which raise questions about use of the (theory of the) model for selecting a point estimate towards the top of the observed empirical range:

- Market practitioners, investors and regulators do not make use of the Black CAPM :
    - Our analysis of broker reports and expert valuation reports shows that very few reports (if any) use the Black CAPM. This indicates that market practitioners and investors do not appear to use the Black CAPM when estimating the required rate of return
    - Experts at the expert concurrent evidence session did not provide evidence of the Black CAPM's use in practice.
    - Other Australian regulators do not give consideration to the Black CAPM
- We have less confidence in the information provided by the model as it is empirically unstable, sensitive to the choice inputs and lacks consensus:
    - APA has acknowledged the considerable difficulties associated with obtaining reliable estimates of the return on the zero-beta portfolio. [1075]
    - Its assumptions are no more realistic than those of the Sharpe-Lintner CAPM[1076]
    - The Black CAPM can produce counter-initiative and non-sensical results. For example, we previously noted that it can produce a zero-beta premium greater than the market risk premium and a negative relationship between

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[1072] AER, Rate of return guidelines, explanatory statement - appendices, December 2013, pp. 68-71.

[1073] AER, Final decision on SA Power Networks' 2015-20 electricity distribution determination, Attachment 3 - Rate of Return, October 2015, pp. 311-312.

[1074] In the 2013 Guidelines we considered a set of criteria for assessing the relevance and quality of relevant evidence and how they may be used for informing our estimates. The criteria are: reflective of economic and finance principles and market information where applicable, fit for purpose, implemented in accordance with good practice, models based on quantitative modelling and market data and other information. Our conclusion was that the Black CAPM only met some of the criteria and should be used to select a point estimate towards the upper half of the range. See: AER, *Explanatory statement rate of return guideline (appendices)*, 17 December 2013, pp. 16–18; AER, SA Power Networks final decision, October 2015, pp. 75–79

[1075] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 25

[1076] AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, SAPN final decision, p. 78

returns and beta–which is not consistent with the theory underpinning the Sharpe-Lintner CAPM or the Black CAPM.[1077]

- Partington and Satchell have consistently advised against use of the Black CAPM and continue to do so in their latest advice for the following reasons:[1078]
    - It contains a number of unrealistic assumptions that Black himself has agreed was not plausible.
    - There are major implementation problems and the robustness of estimates was poor (the estimates are volatile and unreliable).
    - It is not used for estimating the cost of capital in practice.

Our concerns are shared by the CCP16 who has noted that the model is not particularly suitable for estimating ex-ante the equity beta or for 'adjustment' to the empirical data:[1079]

- There is no consensus on the ex-ante estimate of the zero beta premium.[1080]
- Estimates of the return on the zero-beta portfolio are uncertain and unstable.[1081] [1082]
- The significant variability in the proposed zero beta estimates, a variability that is consistent with the fact that neither the market nor regulators generally rely on the estimate.[1083]
- There is too much uncertainty around the empirical analysis of the Black CAPM theory for it to play a substantive role in the AER's decision, and it is not generally applied by market practitioners or regulators.[1084]

Given the above concerns, we note that the 2013 Guidelines may have overstated the appropriate consideration to give to the theory of the Black CAPM. Our further review of the relevant evidence supports not moving our point estimate (towards the top of the observed range) for the theory of the Black CAPM for the following reasons:

- It is not used in practice to set an ex-ante return on equity

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[1077] For example, AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 451–463, p. 284

[1078] Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, 25 May 2018, p. 16–17.

[1079] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

[1080] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 73.

[1081] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 85.

[1082] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 85.

[1083] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

[1084] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 68

- Issues with implementation and output have reduced our confidence in the model. If its effect cannot be reliably and robustly quantified with consistent results, we do not consider it appropriate to use the (theory of the) Black CAPM when selecting our estimates.
- The model does not meet our assessment criteria well[1085]

This is supported by the CRG who submitted that it would be an incorrect assessment of the efficient financing costs of a benchmark efficient entity to place any weight on the Black CAPM.[1086]

We observe some submissions seem to mischaracterise the role of the Black CAPM stated in the 2013 Guidelines and we respond in the table below.

Table 38 Response to mischaracterisation of consideration to Black CAPM in 2013 Guidelines

Submission	Consideration
The 2013 Guidelines sets out an estimate of the zero-beta rate that is 2.8 per cent higher than the risk free rate, which is an extremely high value and indicates that little to no weight should be given to the Black CAPM.[1087]	We note the 2013 Guidelines did not use the Black CAPM in the manner described by the CRG. The theory of the Black CAPM was used to select a point estimate towards the upper bound of the range.[1088]
The AER has not specified what adjustment it has made in relation to the Black CAPM evidence.[1089]	We have transparently set out the consideration given to the theory of the Black CAPM in the 2013 Guidelines and subsequent regulatory decisions. It is used to select a point estimate towards the upper end of the empirical range.

Equilibrium framework

In proposing the use of expected returns to account for the low beta bias issue, APGA submitted that there are issues with the "expected equilibrium" framework espoused by Partington and Satchell as:[1090]

- It ignores actual returns
- It is not clear that the AER assumes that investors form equilibrium expectations.

[1085] Given the absence of substantively new material on the Black CAPM, we consider that our views on the assessment criteria from the 2013 Guidelines remain relevant. Our conclusion was that the Black CAPM only met some of the criteria. See: AER, *Explanatory statement rate of return guideline (appendices)*, 17 December 2013, pp. 16–18; AER, SA Power Networks final decision, October 2015, pp. 75–79

[1086] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 49.

[1087] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 50

[1088] AER, Rate of Return Guidelines Explanatory Statement, December 2013, p. 86.

[1089] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 60

[1090] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, pp. 24

- If the AER adopts an expected equilibrium framework approach there is nothing to suggest that it is the equilibrium suggested by the CAPM.[1091]

We consider that the substance of the APGA's submission is that the AER should use actual returns when estimating the return on equity and the AER's use of the Sharpe-Lintner CAPM (when the market is not in equilibrium) is incorrect.

We have consistently and transparently assessed a range of equity models based on their merits and suitability for our regulatory task when developing our Guideline and in subsequent regulatory decisions. We determined that the Sharpe-Lintner CAPM should be used as the foundation model for estimating the return on equity because it will contribute to the achievement of the ARORO. The Sharpe-Lintner CAPM:

- Has stood the test of time
- Is widely used by market practitioners
- Transparently presents the relationship between risk-reward

The Tribunal has upheld our use of the Sharpe-Lintner CAPM. Expert advice from John Handley and Graham Partington supports our use of the Sharpe-Lintner CAPM.[1092] Service providers have also adopted the Sharpe-Lintner CAPM as the foundation model for estimating the return on equity.[1093]

Further, there are a range of issues with using data to test and adjust the Sharpe-Lintner CAPM, including but not limited to:[1094]

- Testing of an asset pricing model involves how well it describes ex-ante expected returns when security prices are in equilibrium. Empirical work attempts to examine how well the asset pricing model explains ex-post realised returns which 'may not be a particularly good test'.[1095]
- The results are dependent on the method used to conduct the test (for example the characteristics used in sorting stocks into portfolios when testing model performance), was also noted by Kan, Robotti and Shanken. [1096]

Our regulatory task is to estimate the required return on equity for a benchmark efficient entity with a similar degree of risk as a relevant service provider in supplying the regulated services. This must provide ex-ante compensation for efficient financing costs as our regulatory regime is an ex-ante (forward looking) regime.[1097]

[1091] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, pp. 24

[1092] Australian Competition Tribunal, *Applications by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, 26 February 2016, paragraph 735.

[1093] For example APTPPL, APA, Multinet, AusNet, AGN.

[1094] AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 451–463, pp. 179–180.

[1095] Partington & Satchell, *Report to the AER: Analysis of criticism of 2015 determinations,* October 2015, p. 20.

[1096] Partington & Satchell, *Report to the AER: Analysis of criticism of 2015 determinations,* October 2015, pp. 23–24.

[1097] 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*.

We note the use of ex-post data to compute adjustments is not dissimilar to previous regulatory processes where service providers submitted on the empirical performance of the Sharpe-Lintner CAPM and proposed use (or elements) of the Black CAPM and Fama-French model for estimating the return on equity.[1098]

We do not agree with the use of ex-post data to adjust the Sharpe-Lintner CAPM estimates. As noted above, expected returns can diverge from realised returns over a persistent period of time, markets can be in disequilibrium and expectations are not always realised even on average.[1099]

We note that it has previously been acknowledged that one could not truly test if the market is out of equilibrium.[1100]

The APGA's concern with the use of the SLCAPM (when the market is not in equilibrium) would also apply to every model. The issue can be resolved by assuming that historical returns are equivalent to equilibrium expected returns. However, there are a range of issues with this assumptions and it has been previously acknowledged that the two are not equivalent.[1101]

In terms of the equity beta, our approach of empirically estimating beta using historical data is widely used both in practice and in academic work. The fact that realised returns can diverge from expected returns for a long period of time do not invalidate the equity beta data during that period. That is, it still measures the sensitivity of an asset or business's returns to movements in the overall market returns at a given period/time.

APGA submitted that there are alternatives to the SLCAPM such as the international CAPM, the Black CAPM and the Hong and Sraer (2016) model.[1102] As noted above and in section 2.4.1, we determined that the Sharpe-Lintner CAPM should be used as the foundation model for estimating the return on equity for a number of reasons including standing the test of time and widely used by market practitioners. The other models suggested by the APGA contain a number of shortcomings which makes them unsuitable for our regulatory task. For example:

- To our knowledge, the Black CAPM and the Hong and Sraer model are not used in practice by market practitioners to set ex-ante return on equity based on our review of broker reports and valuation reports

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[1098] See for example Frontier, *The required return on equity under a foundation model approach*, January 2016, p. 55. Both HoustonKemp and Frontier use a return on equity that is deemed absent of low-beta bias to estimate an adjustment to the equity beta in the Sharpe-Lintner CAPM. HoustonKemp appears to use ex-post return on equity. Frontier uses a return on equity from its Black CAPM (which is derived using ex-post data). HoustonKemp also uses ex-post return on equity to estimate an 'alpha' term to include in the Sharpe-Lintner CAPM.

[1099] Partington and Satchell, *Report to the AER: Discussion of submissions on the cost of equity*, 8 June 2017, p. 30.

[1100] Multinet Gas, *Rate of Return Overview*, 16 December 2016, p. 21.

[1101] Multinet Gas, *Rate of Return Overview*, 16 December 2016, p. 16.

[1102] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, pp. 24

- The Black CAPM contains a range of shortcomings (for example, empirical instability, potential for non-sensical results, etc.) that we discuss in detail in section 8.3.5 and we are not persuaded to use this material when selecting a point estimate in this review.
- The Hong and Sraer model appears to be a (relatively) new model and is tested using US stock returns.[1103] It is not clear that the model applies in the Australian context. The model's empirical analysis appears to be based on certain assumptions that raise questions about its practical use. For example, it excluded stocks with a share price below $5 and micro caps,[1104] and is based on long term analyst EPS forecasts. Long term EPS forecasts has been shown to be 'extremely' inaccurate[1105] and 'poor predictor of realised earnings growth'.[1106]
- Submissions to the review process have generally supported the use of the SLCAPM as the foundation model for estimating the return on equity

8.3.6 Empirical methodology

Estimation technique

The 2013 Guidelines relied on Henry's empirical study which used Ordinary Least Squares (OLS) (and Least Absolute Deviation (LAD) estimators as a robustness check for outliers in the underlying data) to inform the equity beta parameter.

APA submitted that only the OLS method should be used because an LAD estimator does not have correspondence with the economic meaning of equity beta, ($\beta i = cov(ri, rM)/var(rM)$).[1107]

Our view is to maintain the use of LAD estimators. This is because there may be some concerns about the validity of OLS estimators in the presence of outliers.[1108] The LAD estimator is less affected by the presence of outlier observations than OLS estimators.

Firm and portfolio estimates

The 2013 Guidelines used both firm and portfolio estimates from Henry's study to inform the range and point estimate for equity beta.

[1103] Hong, Sraer, Harrison, David, Speculative betas, 15 June 2015, p. 19.

[1104] Defined as stocks in the bottom 2 deciles of the monthly market capitalisation distribution using NYSE breakpoints.

[1105] Harris, Richard D.F., The Accuracy, bias and efficiency of analysts' long run earnings growth forecasts, Journal of Business Finance & Accounting, June/July 1999, p. 726

[1106] Da, Warachka, Zhi, Mitch, The disparity between long-term and short-term forecasted earnings growth, Journal of financial economics 100, 2011, p. 426.

[1107] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 22

[1108] Henry Olan, Estimating beta: an update, p. 8.

APA cautioned against the use of portfolio estimates for the return on equity of electricity service providers (SKI and AST) or pipeline service providers (APA) due to a difference in beta estimates.[1109]

We consider that because no one comparator firm is perfectly reflective of a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services, we use portfolios and averages of individual firm estimates to determine the equity beta range. We consider taking an average over the individual equity beta estimates is likely to produce an equity beta estimate that is more reflective of a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services than considering individual firm estimates in isolation. [1110] In this respect, we also consider equity beta estimates from various portfolios of comparator firms. Averages of portfolio estimates and averaged individual firm estimates combine information from multiple comparator firms, instead of considering single firms in isolation.

We do observe a difference between estimates. However, this is not necessarily indicative of different systematic risk in the supply of regulated energy network services for gas and electricity providers. We observe that APA has undertaken a range of transactions that would increase their exposure to systematic risk from unregulated assets and/or assets that are different from the risk of providing services with a similar degree of risk as the regulated energy network services.[1111]

We acknowledge that APA has a high proportion of unregulated operations. However, we still include APA in our comparator set because we recognise service providers' concern with a small number of comparators.

Length of estimation periods

In the 2013 Guidelines we recognised that there is generally a trade–off in determining the length of the estimation period.[1112] On one hand, older data might be considered less reflective of current systematic risk assessments (which would suggest a shorter period). On the other hand, in order to obtain a robust and statistically reliable equity beta estimate we need to have sufficient number of observations (which would suggest a longer period).

On balance, we considered it was reasonable to use an estimation period of at least five years and to have regard to the longest period available. We proposed to consider regressions using three permutations of the estimation period:

[1109] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 23

[1110] For example, AER, Final decision SA Power Networks determination 2015–16 to 2019–20, October 2015, pp. 451–463, p. 469

[1111] https://www.apa.com.au/about-apa/our-history/; http://www.duet.net.au/getattachment/ASX-releases/2015/DUET-Completes-Acquisition-of-Energy-Developments/DUET-Completes-Acquistion-of-Energy-Developments-L/DUET-Completes-Acquistion-of-Energy-Developments-Limited.pdf.aspx

[1112] AER, Better Regulation Explanatory Statement Rate of Return Guideline (Appendices), December 2013, p. 49.

- The longest period available
- The period after the 'technology bubble' and before the global financial crisis (GFC) and the period after GFC
- The last five years of available data

We remain of the view that a variety of sampling periods should be used in our empirical study to estimate equity betas for firms we consider most comparable to the firms/assets we regulate. Hence we maintain the use of these 3 estimation periods as they provide long term and more recent estimates of equity beta.

This is supported by thee expert joint report which noted that both long and short term estimates should be considered. Some experts noted that a long data series are likely to produce the most statistically reliable estimates while others noted that a shorter period (e.g. 5 years) may reflect more recent movements.[1113]

APA submitted that variation over time cannot be ignored and older data become less relevant if estimates are to reflect prevailing financial market conditions. It added that estimation using five years of monthly data should allow closer examination of changes, if any, over time in the equity beta.[1114]

We consider this is consistent with our use of last 5 years of available data in our empirical study.

Gearing adjustment

We de-lever a firm's raw equity beta estimates (using a firm's actual gearing).

In the 2013 Guidelines, for firms that hold a minority interest (less than 50 per cent ownership) in an asset or company, their debt and hence gearing may be understated. This is because the investments may be reported using the equity accounting method, which does not require firms to report debt held by those assets on its balance sheet.[1115] We would need to make adjustments to ensure a firm's gearing appropriately reflects the level of debt held by itself and its assets.

Such an instance rose with Spark Infrastructure (SKI) which holds a minority interest in regulated energy networks (SAPN, CitiPower, Powercor and TransGrid). Its share of

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[1113] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 50.

[1114] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 24

[1115] The equity method is used for reporting investments in an associate or a joint venture where the investments is initially recognised at cost and the carrying amount is increased or decreased to recognise the investor's share of the profit or loss of the investee. Essentially firms report their share of profit and loss from investments but is not required to report its share of debt held by its assets. See: AASB Board Standard, Investments in associates and joint ventures, para 10–15. Available at: http://www.aasb.gov.au/admin/file/content105/c9/AASB128_08-15_COMPdec15_01-18.pdf

debt held by those networks was not reported in its public financial reports due to the use of the equity accounting method.

As a result, gearing information computed from its firm-level estimates was likely under-stated. SKI also provided related party lending to those same networks.

To ensure gearing appropriately reflects all debt attributable to SKI, the look through method was used to incorporate the related party lending and SKI's share of the asset-level debt. This method is summarised in the following steps:

- Estimate SKI's share of its assets' borrowings (net of related party borrowings);
- This estimate is then combined with related party borrowings and other borrowings to arrive at total debt, which is then used to derive overall gearing in combination with market value of equity.[1116]

We note that SKI continues to hold minority interest in regulated energy networks:[1117]

- 49 per cent interest in CitiPower and Powercor
- 49 per cent interest in SA Power Networks
- 15.01 per cent interest in TransGrid

It also continues to provide related party lending to those networks.[1118]

We therefore consider it appropriate to maintain the use of the look through adjustment to ensure gearing appropriately reflects all debt attributable to SKI.

Use of other information to estimate equity beta

Mr David Johnstone raised the prospect of using regulated cashflows to estimate the equity beta.[1119] However other experts doubted this proposal due to limitations such as a high degree of subjectivity, potential for data manipulation, departure from the current approach and insufficient data frequency.[1120]

The Consumer Reference Group (CRG) also raised the following questions regarding the use of market data for estimating equity beta:

- How to account for volatility that is driven by issues totally unrelated to the risks the firm takes with its investment in assets and risk fundamentals of defensive stocks.[1121]

[1116] This is consistent with the approach in Henry's study where debt and equity are used to estimate a firm's gearing level.

[1117] SKI, Annual Report 2017, p. 90.

[1118] For example, see SKI, Annual Report 2017, p. 93.

[1119] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 48.

[1120] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 48.

[1121] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 44, 48.

- Market data may not appropriately reflect information for a firm. The market is not fully aware of all aspects of a firm's operations and many investors have little knowledge of a firm's specific risk factors.[1122]
- The return on equity is seen more as a resetting bond with its defined yield and certain maturity date rather than an investment in the stock market.[1123]
- Firms like the benchmark efficient entity have mechanisms available to them to manage exposure to systematic risk which are not available to other firms. The market data used to generate the parameters in the CAPM include full exposure to all these risks.[1124] As a result, the equity beta are overstated.[1125]

We consider the CRG's substantive issue is that the relatively high volatilities (in share price) for APA, SKI and AST appear inconsistent with the (relatively) low risk of supplying the regulated energy services and the overall low volatility in the Australian market.

As noted in section 2.4.1, we consider that the use of market data is appropriate for estimating equity beta. The rate of return needs to be consistent with the prevailing cost of equity[1126] and that is best measured through market data. The rate of return also needs to reflect the efficient cost of finance. We consider that efficient financing costs are more likely to be reflected in the prevailing market cost of capital.

Further, experts also agreed that beta should be estimated from stock market data.[1127] Partington and Satchell have cautioned against using non-market data (such as cashflows) for estimating equity beta. They noted there is a paucity of data (due to cashflows being reported on annual basis) and there would be many difficulties to overcome.[1128]

De/re-levering

The raw equity beta estimates of comparator businesses will reflect varying levels of actual financial leverage. These raw estimates can be de-levered to obtain the asset beta of the business. The result of de-levering reflects the beta of the asset if the asset was financed 100 per cent by equity, with zero debt. These asset betas can then be re-levered to match the level of gearing associated with a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services (as adopted by the regulator).

[1122] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 44.
[1123] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 48.
[1124] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 45
[1125] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 48
[1126] NER; NGR
[1127] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 42.
[1128] Partington and Satchell, Report to the AER: Allowed rate of return 2018 guideline review, 25 May 2018, p. 14–15.

In the 2013 Guidelines we estimated a benchmark gearing ratio of 60 per cent and we used the Brealey–Myers formula (assuming a debt beta of zero) to de-lever and re-lever the comparable businesses' equity beta estimates.[1129] That is:

$$\beta_e = \beta_a \left(1 + \frac{D}{E}\right)$$

where:

- β_e is the equity beta
- β_a is the un-levered asset beta, and
- $\frac{D}{E}$ is the debt to equity ratio.

We note there are views both for and against de-levering and re-levering equity beta estimates. On one hand, the resulting estimates will be more aligned with our benchmark. On the other hand however, the relationship between equity beta, financial leverage and financial risk is complex and uncertain.

There were divergent views on the de/re-levering process:

- The ENA, NSG and APA supported the current approach.[1130] [1131] [1132] The ENA noted that equity beta not re-levered in this way cannot be compared on a like-for-like basis.
- Stephen Gray, Simon Wheatley and Ilan Sadeh agreed that equity betas need to be re-geared to 60 per cent.[1133]
- Graham Partington expressed concern about the de/re-leveraging process due to concerns such as the measurement of leverage, choice of data[1134] He added that the use of equity beta estimates (without re-levering) may be justified given the AER's use of the plain vanilla WACC or if any difference between firm gearing and benchmark gearing is not material[1135]

[1129] AER, Better Regulation Explanatory Statement Rate of Return Guideline (Appendices), December 2013,s ,pp. 50–51

[1130] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 21.

[1131] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9, 49.

[1132] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 14.

[1133] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 11, 12, 13.

[1134] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 39–40.

[1135] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 10

- CCP16 acknowledged that the de/re-levering process is standard practice to 'normalise' equity beta for different gearing levels. However, it also saw merit in Partington and Satchell's view for using raw equity beta estimates. [1136] [1137]
- We maintain the decision to de-lever and then re-lever equity beta estimates to 60 per cent gearing for our empirical analysis.

We note that a firm's gearing level affects its equity beta estimate and our comparator firms have gearing levels that deviate from the benchmark level of 60 per cent. This requires de/re-levering to ensure they are on a like-for-like basis with the benchmark gearing to inform the systematic risk of a benchmark efficient entity with a similar degree of risk as a relevant service provider in respect of the provision of regulated services.

Further, we note the choice of whether or not to de-lever and re-lever is unlikely to be material on the average of individual firm estimates and portfolio estimates. This is because the industry average gearing and the benchmark gearing are very similar. However, the difference between raw and re-levered equity beta estimates for individual firms may be greater because some firms have higher or lower gearing than a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services.

Brealey–Myers formula

There appeared to be confusion regarding the formula we use for de/re-levering during the process to date.

This was noted by Professor Graham Partington at the concurrent evidence session.[1138]

He observed that some said the AER uses the Miles and Ezzell formula while the AER says it uses the Brealey–Myers formula.[1139] He noted that the Brealey–Myers formula assumes a target leverage and continuous rebalancing to never deviate from target.[1140] He added that the AER does not use the Miles and Ezzell formula which assumes annual rebalancing for gearing.[1141]

[1136] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 68

[1137] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 80.

[1138] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 8

[1139] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 8

[1140] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 8

[1141] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 19

However, Stephen Gray, Simon Wheatley and Ilan Sadeh noted that the AER uses the Miles and Ezzell formula.[1142] This was also in the ENA's submission which stated that the Miles-Ezzell formula should be used.[1143]

The Miles and Ezzell formula is reproduced from the joint expert report:[1144]

$$\beta_e = \beta_a\left(1+\frac{D}{E}\right)\left(\frac{1+r_d\left(1-T_c\frac{D}{V}\right)}{1+r_d}\right)$$

We note that this is clearly different from the Brealey-Myers formula we use so it is not clear why some note we use the Miles and Ezzell formula. We reiterate that we use the Brealey–Myers formula for de/re-levering equity beta estimates.

Debt beta

There were divergent submissions on assuming a debt beta of zero:

- Graham Partington noted that 'assuming that the debt beta is zero…results in an upward biased estimate of the equity beta' [1145]
- Stephen Gray noted that debt beta does not carry a material impact when estimating equity beta so long as it is used consistently when de/re-levering.[1146] This had agreement from Glen Wheatley and Ilan Sadeh.
- Ilan Sadeh stated that independent valuers rarely use debt beta.[1147] He added that it would be inconsistent to use market-based evidence to estimate equity beta and then adjust it using a debt beta that 'nobody knows where it came from'.
- The ENA supported a debt beta of 0 because a reasonable estimate of debt beta has no material impact on the final estimate of equity beta and because of measurement issues.[1148] It added that in practice it is common to use a debt beta of zero because debt beta estimates tend to be very small[1149]

[1142] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 12–13

[1143] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46, 50

[1144] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 40.

[1145] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 1, 15 March 2018, p. 41

[1146] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 12

[1147] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 13

[1148] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46.

[1149] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 50.

Our view is that the debt beta should continue to be zero. It appears market practice to assume a debt beta of zero[1150] and Damodaran has made the same assumption in his works.[1151] Further, the debt beta of businesses in the provision of regulated energy network services are likely to be low due to the relatively low risk of supplying regulated energy network services.

8.3.7 Industry analysis

In the Equity Beta Discussion Paper,[1152] we estimated the industry/sector beta for 11 Australian industries as classified by Bloomberg. We noted that the composition of the industry indices suggests that utilities would be the most comparable industry group. This is because the utilities index includes our comparator firms[1153] which make up 3 of the top 5 firms in this index.[1154]

Submissions and experts have supported the use of industry indices:

- The CCP16 considered that using industry/sector indices (as defined by Bloomberg) to improve the estimate of the equity beta for the BEE appears to have some potential and should certainly form part of the AER's considerations for the new instrument.[1155] It added that there is considerable benefit in the AER further pursuing the option to use the Bloomberg Utilities index as part of the information contributing to the estimation of the equity beta for the BEE. [1156] [1157]
- Partington and Satchell noted the utilities industry would probably be the industry that most closely resembles the energy network businesses as the industry classification includes these businesses.[1158]
- The expert joint report noted that industry and sector indices are likely to be too broad and with different risks reflects than those of the BEE.[1159] However, some experts noted that industry indices might be relevant and would be open to its use.[1160]

[1150] Based on our analysis of broker reports and expert valuation reports.

[1151] Damodaran, A. (2002). Investment Valuation – Tools and Techniques for Determining the Value of any Asset, 2nd edition, New York, John Wiley & Sons, p. 194.

[1152] AER, Discussion paper equity beta, March 2018.

[1153] The Bloomberg utilities index includes our comparator firms that remain listed (APA, AST and SKI).

[1154] The top 5 firms in the utilities index make up the majority of the index: 3 of these firms are part of our comparator set (APA, AST and SKI).

[1155] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 82.

[1156] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 82.

[1157] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

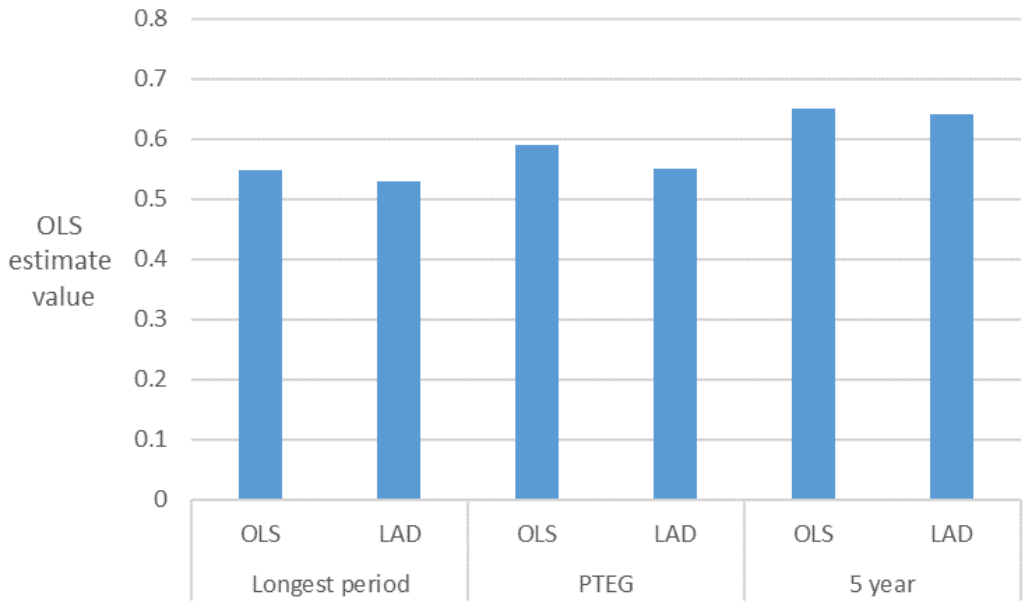
[1158] Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, May 2018, p. 15.

[1159] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 47.

[1160] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 47.

We have updated this analysis to March 2018 using OLS and LAD estimators and 3 scenarios.[1161] Figure 28 shows that OLS estimates range between 0.55–0.67 and LAD estimates range from 0.53–0.64.

Figure 28 Utilities index beta estimates



Source: AER analysis, Bloomberg

Note: PTEG is Scenario 2 which is post tech boom excluding GFC

8.3.8 Other information informing range and point estimate

We note there is other information available to inform our selection of the range and point estimate:

- Our analysis of the impact of regulation in section 8.3.2 suggests that regulation reduces the systematic risk. Our comparator set contains firms with varying levels of regulated operations and firms with majority regulated operations typically have lower equity beta estimates. We do not exclude firms with fewer regulated operations from our comparator set. However, estimates for the longest estimation period derived from firms with a high proportion of regulated operations are clustered in the bottom half of the empirical range.
- There has been a material decrease in the debt risk premiums in the market since the 2013 Guidelines. Further, the spread between the prevailing debt risk premium and the 2013 Guideline's estimated equity risk premium has widened from approximately 1.1 per cent (in 2013) to 2.8 per cent. This suggests that required

[1161] The longest estimation period, post tech-boom excluding GFC, last 5 years.

risk margins on capital have decreased since 2013. This information is supportive of choosing a lower equity risk premium than in 2013.

- The regulatory framework mitigates systematic risk in the supply of regulated energy network services. This is especially the case where our use of a trailing average cost of debt provides a natural hedge against movements in interest rates and our method for accounting for inflation provides compensation for outturn inflation. This provides support for a point estimate towards the bottom half of the range.
- Certainty and stability are desirable to attract and retain funds Consumers, investors and regulated entities value stability. This factor supports choosing a beta value consistent with our current approach.
- The Bloomberg Australian utilities index[1162] includes the 3 still-listed comparator firms which make up 3 of the top 5 firms in this index. We give most weight to the longest estimation period which yields OLS estimate of 0.55 and LAD estimate of 0.53.

8.3.9 Range and point estimate

We choose an empirical range of 0.4–0.8 based on our update of Henry's study in section 8.3.2. We consider the equity beta of a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services is in this range for the following reasons:

- Our conceptual analysis supports that the equity beta of a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services would be low and below 1.0 (see section 8.3.1).
- International empirical estimates supports an equity beta estimate below 1.0 (see section 8.3.4).
- We consider the systematic risks of the networks we regulate are sufficiently similar between the different types of network we regulate to warrant one estimate (see section 2.4.2).

In selecting a point estimate, we continue to give most weight to empirical estimates of the firms we regulate. Our conclusions from examining these estimates are:

- Estimates across all estimation periods and techniques cluster around the 0.5–0.6 range. The average of OLS estimates across all periods is 0.57.

Empirical estimates have increased since 2013. However, the increase has been small, particularly over the longest estimation period which we given the most weigh to (as discussed in section 8.3.2). Further most estimates continue to cluster around the 0.5–0.6 range as observed in Figure 25 and

[1162] The composition of the industry indices suggests that utilities would be the most comparable industry group.

- Table 31.
- We give most weight to the longest estimation period. This supports an empirical estimate of 0.51[1163] and is consistent with the clustering observed in the previous dot point.

In the 2013 Guidelines we estimated a beta point estimate that was some distance above the best empirical estimates for our comparator firms. We did so to promote stability and caution. The point estimate in the 2013 Guidelines was a decrease from the beta value of 0.8 used in previous regulatory determinations and we did not want to move a large increment. We also took into account the theory of the Black CAPM.

On the balance of evidence, we consider that an equity point estimate of 0.6 is reasonable as it reflects:

- The result of our empirical analysis which we give most weight. This supports an equity beta estimate of 0.57 across OLS estimates for all estimation periods and a value of 0.51 for the longest estimation period
- The other information we have considered as discussed in section 8.3.8
- A clear and transparent manner with which to set the equity beta estimate.
- Promoting stability by not departing substantially from our previous value and leaves some scope to account for concerns around market imperfections affecting the SLCAPM while recognising the other factors we have identified as relevant.

In support of an equity beta of 0.7 or higher, service providers, investors and network associations have submitted that beta estimates have increased since the 2013 Guidelines.[1164] [1165] [1166] [1167] Some experts noted that the AER's own estimates shows this movement. [1168] In its April 2018 report for AusGrid, Frontier has also submitted that the AER's own evidence shows an increase since the 2014 which has been muted due to the de-listed firms.[1169]

We first note these submissions appear similar to Prof. Gray's suggestion of starting from the 2013 value of 0.7 and letting market movements dictate if a change is warranted.[1170] However, this ignores considerations in the 2013 Guidelines, which

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[1163] Simple average of portfolio-level estimates and the average of firm-level estimates.

[1164] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 3.

[1165] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46.

[1166] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 55.

[1167] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 15.

[1168] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 52.

[1169] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 33.

[1170] AER, Transcript of proceedings Australian Energy Regulator office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 39.

supported an empirical point estimates of 0.5. The (eventual) point estimate of 0.7 was selected due to the theory of the Black CAPM, international estimates, certainty and stability. In this review we are not persuaded to select an equity beta towards the upper end of our observed empirical range based on our further consideration of the Black CAPM and international estimates.

It is also not clear to us that the movements since 2013 are supportive of an increase in the systematic risk in the supply of regulated energy services and an equity beta above 0.7:

- Submissions in support of increased risk generally focused on the effect of technological risks, natural disasters and policy risk. We consider these risks are non-systematic and do not warrant compensation through the rate of return in section 2.4.1.
- Partington and Satchell have advised that a number of reasons can contribute to observations of an increase in beta including the de/re-leveraging process and changes in the individual characteristics of one firm.[1171]
- Consultants retained by the service providers have previously acknowledged that the increase is driven by gearing movements. [1172]
- Some firms have undertaken a range of transactions that would increase their exposure to systematic risk from unregulated assets and/or assets that are different from the risk of providing the regulated energy network services. [1173]

This view is shared by the CCP16 who noted that the evidence to date does not support an increase in the estimate of the equity beta as they are based on short term estimates and many features of the post 2013 regulatory regime would reduce systematic risk. [1174]

We note one key factor for service providers' observation may be falling interest rates since the 2013 Guidelines. Partington and Satchell have noted that low beta stocks such as our comparator firms can be considered bond proxies and have been noted as such by financial institutions and practitioners. [1175]

They explained that ‘bond proxies are likely to respond to interest movements in a fashion that is to some extent similar to bonds. That is, there is likely to be an inverse

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[1171] Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, 25 May 2018, p. 17.

[1172] For example, CEG, Replication and extension of Henry’s beta analysis, 21 September 2016; CEG, Replication and extension of Henry’s beta analysis, November 2016

[1173] https://www.apa.com.au/about-apa/our-history/; http://www.duet.net.au/getattachment/ASX-releases/2015/DUET-Completes-Acquisition-of-Energy-Developments/DUET-Completes-Acquistion-of-Energy-Developments-L/DUET-Completes-Acquistion-of-Energy-Developments-Limited.pdf.aspx

[1174] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 73

[1175] Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, 25 May 2018, p. 18; DJ Carmichael, Increasing Focus on Global Bond Yields, 20 July 2017; Motley Fool, Citigroup thinks this income could deliver a fatter-than-expected dividend, February 2018, available at: https://www.fool.com.au/2018/02/28/citigroup-thinks-this-income-stock-could-deliver-a-fatter-than-expected-dividend/

relation between prices and interest rates.' [1176] As a result, we consider that they would tend to outperform the market during times of interest rate decreases.[1177] This view is shared by Partington and Satchell whom noted that bond proxies '[does] particularly well with substantial price appreciation in the period of low interest rates'. [1178]

The associated outperformance would drive an increase in equity beta estimates[1179] even though the true systematic risk of supplying regulated energy network services may remain (relatively) unchanged. This is because the revenue earnt from regulated energy services are determined during regulatory resets and (generally) guaranteed over a regulatory period. Regulation of energy network services also mitigates exposure to systematic or compensable risk as discussed in section 2.4.3.

The outperformance would be magnified by the low risk from the market (as indicated by the VIX index in section 7.3.5) which made bond proxies even more bond like.[1180]

Given the above concerns with beta movements since the 2013 Guidelines and recent interest rate movements, we consider they lend more support for giving most weight to empirical estimates from the longest estimation period.

In section 8.3.2, our comparison of still-listed majority regulated firms indicated potential for a value less than that from the whole comparator set. However, we note that the 2013 Guidelines estimated a lower equity beta than previous determinations (from 0.8 to 0.7) even though longer term estimates were clustered materially below 0.7. In part, we took into account the need to promote stability and predictability and therefore decided not to make a larger change. We adopt similar considerations in this decision and consider a further reduction at this time will provide an estimate that is more in line with empirical estimates and so we have reduced the equity beta by 0.1.

We note Prof. Gray and Dr. Wheatley stated that our estimates of equity beta in the 2013 Guidelines were at a 'low point in the cycle' and have increased since that time.[1181]

We consider that, if there is a cyclical aspect, this would warrant placing more emphasis on the use of long term data series for estimating parameters and avoid over-reliance on short term estimates which may capture a section of the cycle and unduly effected by interest rate movements, volatilities and 'one-off' events.

Material informing range and point estimate

[1176] Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, 25 May 2018, p. 21.

[1177] https://www.clime.com.au/investing-report-archive/time-sell-bond-proxies/; https://www.commbank.com.au/guidance/retirement/what-you-need-to-know-about-bond-proxies-201610.html;

[1178] Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, 25 May 2018, p. 18.

[1179] Equity beta measures the 'riskiness' of a firm's return compared with that of the market. Both negative and positive outperformance compared with that of the market would drive increase in the equity beta estimate.

[1180] Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, 25 May 2018, p. 19.

[1181] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 24.

Stakeholders submitted divergent views on the weight given to particular piece of evidence for informing the equity beta parameter.

Consumer groups supported an approach that focused on the use of market practice, advice from Partington and Satchell and reducing the weight given to the Black CAPM.[1182] Service providers and network associations proposed for more and explicit weight for the Black CAPM and low beta bias (as noted and discussed in section 8.3.5). They also supported expanding the comparator set to include international energy firms and other Australian infrastructure firms (as noted and discussed in section 0).

We have assessed the strengths, weaknesses and suitability of each relevant piece of evidence.

We concluded that international empirical estimates are not suitable for inclusion in the comparator set in section 0. Our view is that they are better used in a qualitative manner as a cross check for our empirical range. Differences with a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services means that international estimates cannot be used to meaningfully and robustly inform the equity beta estimate.

We have considered the Black CAPM and low beta bias. Our view is to not use the (theory of the) the Black CAPM or the low beta bias when selecting our point estimate. Our assessment, in section 8.3.5, concluded that they are not suitable for our regulatory task which is to estimate the ex-ante rate of return required to efficiently compensate for a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy network services.

The ENA submitted that the international evidence considered by the AER and the evidence from other domestic infrastructure indicates an equity beta above 0.7.[1183] Our assessment of international energy estimates in section 0 and 8.3.4 shows that they should be used in a cross checking role. We consider no weight should be given to other Australian infrastructure firms in section 0.

We note Energy Australia recommended we focus on ensuring the best estimate from the Sharpe-Linter CAPM is applied, as it is a model widely used to ascertain an appropriate weighted average cost of capital. [1184]

Submissions on selection of range and point estimate

We received a number of submissions on the selection of range and point estimate. We respond to them in the table below.

[1182] Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 89; Energy Consumers Australia, Review of the rate of return guideline response to the AER Issues Paper, December 2017, p. 23, 27; EUAA, EUAA submission – AER rate of return review issues paper October 2017, 18 December 2017, p. 9

[1183] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9

[1184] Energy Australia, AER – Review of the rate of return guideline –evidence sessions, 4 May 2018

Table 39 Response to submission on selection of range and point estimate

Submission	Consideration
Submissions to the review have submitted for more transparency in the selection of range and point estimate[1185] Professor Stephen Gray also noted that that the AER's current approach does not make sense because the empirical range should not bound information on estimates from other sources of evidence. He noted that it would be better to set out and consider all evidence on equal footing	We have transparently set out our assessment of and the weight given to each piece of relevant evidence in accordance with step 2 of our foundational model approach. We have done this in the 2013 Guidelines, subsequent regulatory decisions, and this decision.[1186] We have set out all the relevant evidence equally in step 2 of our decision and the weight given to a piece of evidence is based on its strengths, weaknesses and suitability for our regulatory task. To give equal weight to all relevant evidence ignores the fact that some material may be better suited in a qualitative role.
We received divergent submissions on the point estimate for equity beta. Consumer groups submitted for a point estimate of 0.6 and below.[1187] Service providers, investors and network associations espoused an equity beta of 0.7 and above.[1188] [1189] [1190]	We set out how we arrive at our point estimate in section 8.3.9. We have had regard to all the relevant evidence in accordance with the weight we give them after assessing their strengths, weaknesses and suitability for our regulatory task.
We note Prof. Gray's view that we should start from the 2013 Guidelines estimate of 0.7 and let evidence indicate any changes to this point estimate.[1191]	We note our regulatory task is to estimate an efficient rate of return to compensate for a benchmark efficient entity with a similar degree of risk as a relevant service provider in supplying regulated energy network services. Simply starting from a value of 0.7 would discount a range of relevant considerations, including: • those from the 2013 Guidelines that indicated a range of 0.4–0.7 and supported a (possible) point estimate towards the lower value within this range • information we have received since the 2013 Guidelines on relevant evidence that would change the weight given to them. The 2013

[1185] Ergon Energy and Energex, AER Issues paper review of the rate of return guidelines Ergon Energy and Energex submission, 12 December 2017, p. 2; Network Shareholder Group, Re: Response to issues paper on the review of the rate of return guideline, 12 December 2017, pp. 9-10; Evoenergy, Review of rate of return guideline –evidence sessions, 4 May 2018, p. 3; APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 3.

[1186] For example, see: AER, Final decision SA Power Networks determination 2015–16 to 2019–20 Attachment 3 – Rate of return, October 2015, p. 52–55, 93– 95

[1187] Energy Consumers Australia, Review of the rate of return guideline response to the AER Issues Paper, December 2017, p. 27; CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 51, 68; Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 68.

[1188] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 60, 63; Evoenergy, Review of rate of return guideline – evidence sessions, 4 May 2018, p. 3; APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 5.

[1189] CKI, AER discussion papers-review of the rate of return guideline, 4 May 2018, p. 6.

[1190] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 14

[1191] AER, Transcript of proceedings Australian Energy Regulator office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 39.

Submission	Consideration
	Guidelines estimated an equity beta point estimate of 0.7 having regard to the theory of the Black CAPM and international estimates. As discussed in section 8.3.5 and 8.3.4, we are not persuaded to move our point estimate (towards the upper end of the observed empirical range) for the Black CAPM and we use international estimates qualitatively in a cross-checking role. • Professor Satchell also disagreed with Prof. Gray's proposal as that would discard information that supported lower values and may misconstrue the 0.7 as the mid-point of a range.[1192]
The APGA submitted that the remaining listed firms should be used to form an estimate and confidence interval with other information subsequently used to adjust the confidence interval to arrive at a point estimate.[1193] At the expert concurrent evidence session, experts discussed setting confidence interval (using standard deviations) and a point estimate for individual parameters which is then used to set a point estimate and a confidence interval for the WACC.[1194] Other (qualitative) information can be used to select the end WACC from the confidence interval[1195]	We disagree with the use of confidence intervals in this way for reasons we have previously outlined.[1196] These reasons include: • The presence of outliers can affect point estimates and their associated confidence intervals. • The presence of autocorrelation and heteroskedasticity creates difficulties in discerning whether confidence intervals overstate or understate the upper bound estimate. • Further, we consider the intent of the method discussed by experts is not dissimilar to the foundational model approach. The focus is on using other information to triangulate and perform a reasonableness check on the end estimate. Step 5 of our foundational model approach compares our return on equity against information from other relevant evidence to assess the reasonableness of our estimate.
The CCP16 submitted that most weight should be placed on longer estimation periods.[1197] It added that it is essential that a long-term data series is used, as on balance and noting the risks of this, the task of the AER is to estimate ex-ante the long-term beta and to see through the ups and downs of annual data and short-term trends[1198]	This supports our view to give most weight to the longest estimation period and the view that longer estimation period is likely to provide more robust equity beta estimates.[1199]
David Johnstone submitted that there is a risk of circularity with decisions on the	It is not clear that such circularity exists as we have not been provided with evidence to allow assessment of this hypothesis. We also note that it

1192 AER, Transcript of proceedings Australian Energy Regulator office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 44

1193 APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 6.

1194 AER, Transcript of proceedings Australian Energy Regulator office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 131–132

1195 AER, Transcript of proceedings Australian Energy Regulator office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 131–133

1196 AER, *Final decision: WACC review*, May 2009, pp. 286-290.

1197 Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 83.

1198 Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

1199 AER, Final decision: WACC review, May 2009, p. 329.

Submission	Consideration
rate of return parameters influencing future estimates.[1200] [1201] [1202]	would be difficult for an entity to manipulate its own price to distort its beta estimate.[1203] Further, this did not appear to be a substantive concern as the CCP16 acknowledged that the 'decision on the level of beta…does not affect the future empirical estimates of beta'.[1204]
The ENA submitted the only evidence that supports maintenance of the same equity beta as in 2013 is the evidence from delisted firms, whose beta estimates are frozen in time forever. [1205]	We disagree. In the 2013 Guidelines we chose to estimate a beta value that was some distance above the best empirical estimates for our comparator firms. We did so to promote stability and caution. The beta estimate in the 2013 Guidelines was a decrease from the beta value of 0.8 in previous determinations, and we did not want to move a large increment. We also took into account of the theory of the Black CAPM and international estimates. Our further consideration of the relevant evidence provide a range of 0.4–0.8 and a point estimate of 0.6. We consider that international estimates should be used qualitatively and we are not persuaded to select an equity beta towards the top of the observed empirical estimate for the (theory of the) Black CAPM
The CCP16 submitted that it does not accept that the AER should select a figure at the top of the empirical range. It recommended that the AER adopt a more balanced view on each of the parameters including the equity beta. [1206]	As discussed in section 8.3.9, on the balance of the evidence, our draft decision is to adopt a point estimate of 0.6 which is towards the middle of the empirical range.
Both the CCP16 and ATCO gas appeared to support an approach that results in stability[1207] [1208]	In forming the range and point estimate we have had regard to stability as part of our consideration of other information in section 8.3.8 and 8.3.9.
We suggest the AER take a more balanced approach, by selecting values for each parameter that are more towards the mid-point of the calculated range. This would ensure that the allowed rate of return for a network business is commensurate with the efficient financing costs of benchmark	As discussed in section 8.3.9, on the balance of the evidence, our draft decision is to adopt a point estimate of 0.6 which is towards the middle of the empirical range. We do not simply set the point estimate as the middle-point of the empirical range.

[1200] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 80.

[1201] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 41–42.

[1202] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 80.

[1203] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 42.

[1204] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 42.

[1205] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9

[1206] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 69

[1207] Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 89.

[1208] ATCO gas, Re: Review of rate of return guideline-issues paper, 12 December 2017, p. 7–8.

Submission	Consideration
efficient entity with a similar degree of risk. It would also be more consistent with meeting the National Electricity Objective and the National Gas Objective.[1209]	
Investors also noted that there should be a high bar to change from the current approach and there is no compelling reason to make any adjustment to the approach.[1210]	As discussed in section 8.3.4 and 8.3.5, divergent submissions have led us to further consider the weight given to certain relevant evidence. We consider information and advice that we have received since the 2013 Guidelines has reinforced existing and highlighted new limitations of the Black CAPM and international estimates. Therefore, our draft decision is that international estimates should be used qualitatively and we are not persuaded to select a point estimate towards the upper end of our observed empirical range for the (theory of the) Black CAPM.
APA submitted that current estimate shows the systematic risk faced by APA is above that for which the benchmark is compensated. It added that there is nothing in the beta estimate of APA that tells us that the current estimate of 0.7 over-compensates gas businesses in particular.[1211]	We note that current estimates for APA does not necessarily reflect the risk of supplying regulated energy network services as it has undertaken a range of transactions that would increase exposure to systematic risk from unregulated assets and/or assets that are different from the risk of providing services with a similar degree of risk as the reference services.[1212] This should not affect their systematic risk of supplying regulated energy network services. However, we have not excluded APA from our comparator set due to service providers' concerns with a small comparator set.
Major Energy Users submitted that a revenue cap is less risky than a price cap and would lead to an overestimated beta.[1213]	This issue was previously considered in the 2009 WACC review. We considered that there was no compelling evidence to suggest that the equity beta should differ based on the form of control (revenue cap vs. price cap).[1214] The MEU acknowledged that there was only marginal difference between price and revenue caps on exposure to systematic risk and did not set propose to set a different equity beta based on the form on control.

AusGrid submitted an April 2018 Frontier report titled 'Estimation of certain aspects of the allowed rate of return' as part of its regulatory proposal.[1215] The report submitted that empirical estimates have increased since the 2013 Guidelines, which warrants an equity beta of at least 0.7 and other ASX-listed infrastructure firms support an equity beta materially higher than 0.7.[1216]

We first note that Frontier appears to regard the 2013 Guidelines' point estimate of 0.7 as a starting point for this review. As discussed in Table 39, we disagree with this view because to estimate an efficient rate of return to compensate for a benchmark efficient entity with a similar degree of risk as a relevant service provider in supplying regulated

[1209] Energy Australia, AER – Review of the rate of return guideline –evidence sessions, 4 May 2018

[1210] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 14.

[1211] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 4.

[1212] For example: https://www.apa.com.au/about-apa/our-history/; http://www.duet.net.au/getattachment/ASX-releases/2015/DUET-Completes-Acquisition-of-Energy-Developments/DUET-Completes-Acquistion-of-Energy-Developments-L/DUET-Completes-Acquistion-of-Energy-Developments-Limited.pdf.aspx

[1213] Major Energy Users, Review of the rate of return guidelines, December 2017, p 7–8.

[1214] AER, Final decision: WACC review, May 2009,, p. 251–252, 341.

[1215] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018.

[1216] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, pp. 14–27.

energy network services. Simply starting from 0.7 would discount a range of relevant considerations.

We have reviewed this report and note that this is substantively the same as the August 2017 Frontier report considered in our November 2017 final decision for APA VTS.[1217] Similar to the August 2017 report, the April 2018 report relies on the following material:

- Comparison of 5 year estimates to 10 year estimates[1218]
- Rolling 5 year beta estimates[1219]
- ASX-listed infrastructure firms[1220]

As a result, our observations of the August 2017 report remains appropriate for informing our view on the April 2018 report:[1221]

- Frontier's observations of increases continue to be driven by shorter term (5 year) estimates of equity beta such as 5 year weekly estimates.[1222] Frontier itself supported the use of longer term data and noted that 'five years of data is insufficient to provide statistically reliable estimates of beta'.[1223] This is consistent with our approach because longer-term data is less vulnerable to interest rate movements, market volatility and one-off events (for example, the GFC) which may unduly affect the 'true' beta of supplying the regulated energy services.
- To the extent we have regard to Frontier's 10-year estimates, they are consistent with our empirical range and do not support an increase to our range and point estimate:
    - Frontier's average of 10-year weekly firm-level estimates is 0.51 which is consistent with our empirical estimates which cluster in the 0.5–0.6 range.[1224]
    - Frontier's 10-year weekly portfolio-level estimates are consistent with our portfolio estimates.[1225]
- We do not consider that other ASX-listed infrastructure firms can be used to inform the equity beta of a benchmark efficient entity with a similar level of risk as a relevant service provider in providing reference services. As noted in section 0, this

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[1217] Frontier, updated rate of return parameter estimates, August 2017; AER, Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return, November 2017, p. 68

[1218] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 20.

[1219] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 21-22.

[1220] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 25-27.

[1221] AER, Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return, November 2017, , p. 71.

[1222] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 20.

[1223] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 19.

[1224] Frontier, Estimation of certain aspects of the allowed rate of return, April 2018, p. 20.

[1225] Frontier estimated fixed-weight portfolio beta of 0.55 and value-weighted portfolio beta of 0.59. Henry's study supported a range of 0.38–0.71 for portfolio-level estimates with a range of 0.38–0.52 for fixed weight portfolios and 0.38–0.71 for value-weighted portfolios.

is because the risk characteristics other Australian infrastructure businesses would be very different to a firm supplying the regulated energy services.

We recognise that we rejected the August 2017 report and maintained an equity beta of 0.7 in the APA VTS decision.[1226] However, this was in the context of rejecting APA VTS's proposal a beta of 0.8, and occurred prior to this review. We have concluded that a point estimate of 0.6 is appropriate following a further consideration of the relevant evidence in this review. Our consideration of the August 2017 report is consistent with the views in this decision.

We note CEG's November 2017 report for Essential Energy proposed an equity beta of 0.8–0.9 based on the following key arguments:[1227]

- Increase in empirical estimates[1228]
    - The average 5 year re-levered beta of four firms [1229] has increased to 0.81 and would lead to 0.94 if DUET is excluded.
    - Portfolio estimates consisting of the four firms have increased over time particularly for 3 year and 5 year estimates which have increased to above 0.9.
- The Black CAPM should be used to address the low beta bias associated with the SLCAPM and the AER has acknowledged in the 2013 Guidelines the bias as a reason for selecting a top of the range point estimate.[1230] Adjusting for the low beta bias (using a range of zero beta premiums)[1231] supports a beta of above 0.7 and at least 0.8.[1232]

We caution over reliance on short term estimates for informing the equity beta. This is because they can be unduly effected by factors such as market volatilities, one-off events and interest rate movements which can mask the systematic risk of a firm supplying regulated energy services. As noted in 8.3.2, our empirical study, which is based on a variety of estimation periods, supports an empirical range of 0.4–0.8 and a point estimate of 0.6.

In section 8.3.5, we discussed that the low beta bias and Black CAPM are different concepts. We did not, and do not, give weight to low beta bias either in the 2013 Guidelines or in this review. We have also further considered the Black CAPM and are not persuaded to select an equity beta towards the upper end of the observed empirical range due to less confidence in the model, empirical issues and lack of use in

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[1226] AER, Final decision APA VTS gas access arrangement 2018 to 2022 Attachment 3–Rate of return, November 2017, , p. 71.

[1227] CEG, WACC parameter estimates for Essential Energy, November 2017, p. 25.

[1228] CEG, WACC parameter estimates for Essential Energy, November 2017, p. 25.

[1229] APA, DUET, Spark Infrastructure (SKI), AusNet Services (AST)

[1230] CEG, WACC parameter estimates for Essential Energy, November 2017, p. 30.

[1231] Zero beta premiums are estimated as part of implementing the Black CAPM. This is added to the risk free rate to form the zero beta return which is the intercept in the Black CAPM.

[1232] CEG, WACC parameter estimates for Essential Energy, November 2017, p. 33.

practice. CEG's table of various zbp/MRP estimates range from 0.5 to 5.57 reinforces our view on the model's shortcomings such as empirical instability and sensitivity to the choice of inputs.

8.4 Summary of submissions and responses

Table 40 Summary of submissions and responses on equity beta

Key point	Submission	Stakeholder	AER response
Different betas should be set for gas and electricity businesses	Gas and electricity businesses face different risks.	APGA[1233], Stephen Gray and Greg Houston	We consider systematic risk are sufficiently similar between businesses to warrant one benchmark and beta. This is because of their intrinsic business risk (supply of monopoly service) and similar regulatory framework (which mitigates systematic risk).Partington and Satchell also noted difficulties in quantifying any difference.
	There are no strong theoretical reasons for believing that the asset βs of regulated electricity and gas businesses should be the same, or that βs are the same across transmission and distribution. Those βs should be estimated from stock market data, but that will not be without its challenges.	APA[1234]	
	The NZCC has set a higher beta for gas businesses	APGA[1235]	The NZCC noted that none of its reasons justified an uplift alone and its reasons appears to be NZ-specific and not relevant to a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services.
Empirical beta estimates have increased the 2013 Guidelines	The AER's update indicate increase in empirical estimates.	APGA[1236] ENA[1237] [1238] NSG[1239]	We observe some increase in empirical estimates since the 2013 Guidelines. However, we give most weight to the longest estimation period which indicates marginal movement from 2013. It is also not clear that this represents an increase in the systematic risk of
	CCP16 is sceptical of finding	CCP16[1240]	

[1233] Australian Pipeline and Gas Association, Submission to the Issues Paper: AER review of the rate of return guideline, 12 December 2017, p. 4

[1234] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 17

[1235] Australian Pipeline and Gas Association, Submission to the Issues Paper: AER review of the rate of return guideline, 12 December 2017, p. 4

[1236] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 3.

[1237] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46.

[1238] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 55.

[1239] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 15.

[1240] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

Key point	Submission	Stakeholder	AER response
	from the networks' consultants that equity betas have increased in recent years		supplying regulated energy network services: • Consultants retained by service providers previously acknowledged that the increase is driven by gearing movements. • Interest rate movements may drive changes due to the comparator firms being bond proxies • Partington and Satchell also advised that the de/re-leveraging process and changes in individual characteristics of a firm may drive movements
The comparator set is not representative	The comparator set do not represent the BEE as some firms contain substantial unregulated businesses	CRG[1241] MEU[1242]	We consider, ideally, firms that share all or most of the key characteristics of a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services would be used when conducting our empirical analysis to estimate the equity beta. However, in practice, few firms would fully reflect this benchmark. Therefore we use market data for domestic businesses that are considered to be reasonable comparators to the benchmark efficient entity to inform the equity beta estimate.
	The comparator set is not representative of gas businesses with only 1 firm left	APA, ENA[1243]	
	The Beta should not be based on unregulated firms and that it has been at the higher end of its potential range.	CRG[1244]	
The comparator set should be expanded	It is too small and needs to be bolstered by international and other Australian infrastructure firms	ENA[1245] CKI[1246] Jemena[1247] ENA[1248] Stephen Gray	We disagree. Our view is that the comparator firms need to reflect information from firms that are most comparable to a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services we regulate. The most relevant data for estimating equity beta is domestic energy network firms. A number of differences with a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services (regulatory framework, business risk, etc.) means that international firms and other Australian infrastructure firms should not be included in the

[1241] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 26.

[1242] Major Energy Users Inc, Review of the rate of return guidelines issues paper submission by the Major Energy User Inc, December 2017, p. 12.

[1243] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 18, ENA, Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9

[1244] AER, Summary of 11 December 2017 Session with CRG, 11 December 2017,

[1245] Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 31,

[1246] Cheung Kong Infrastructure, AER Issues Paper – Review of the rate of return guideline, 12 December 2017, p. 5.

[1247] Jemena, Submission on concurrent expert sessions and discussion papers, 4 May 2018, p. 3.

[1248] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46, 62.

Key point	Submission	Stakeholder	AER response
			comparator set.
	Caution the inclusion of international estimates and other Australian infrastructure firms if the new data is not particularly relevant to the benchmark efficient entity	CCP16[1249]	We agree.
	Narrow set of firms is of itself an [insufficient] rationale to include additional comparators'	NSG[1250]	We agree.
	The AER's sample of domestic comparators has further reduced and now numbers only three. Logically, as the sample of close domestic comparators reduces, relatively more weight must be given to the other relevant evidence.	ENA[1251]	If we were to expand comparator set, this must be after satisfying that the additional firms are appropriately similar to a benchmark efficient entity with a similar degree of risk to the relevant service provider in the provision of regulated energy services. We consider neither international firms nor other Australian infrastructure firms meet this.
	It is necessary to weigh up the high statistical reliability of that evidence (because the sample size is so much larger than the three domestic comparators) against the fact that the evidence is not as directly applicable to the BEE, which operates exclusively in the Australian market	ENA[1252]	Our assessment of international and other Australian infrastructure firms indicates that they are not comparable to a BEE with a similar degree of risk to the relevant service provider in the provision of regulated energy services.
	The international comparators have the benefit of being energy network businesses and providing an energy network service, but the disadvantage of operating in a different market. This leads to another set of comparators – other domestic infrastructure firms. These firms operate in the Australian market in an industry that is close to, but	ENA[1253]	

[1249] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018

[1250] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 15.

[1251] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9

[1252] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 62

[1253] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 62

Key point	Submission	Stakeholder	AER response
	not exactly equivalent to, the provision of energy network services		
	There is no simple mathematical adjustment which might be applied to those international data to make them comparable with data from the extant domestic comparators	APA[1254]	We agree.
	the use of international data may increase statistical precision, but at the cost of biased estimates of β	APA[1255]	We agree.
	If the set of comparable businesses is to be expanded, then careful consideration should be given to other Australian infrastructure businesses before turning to possible international comparators.	APA[1256]	We disagree with expanding the comparator set to include other Australian infrastructure firms as a range of differences with a benchmark efficient entity with a similar degree of risk as a relevant service provider in the provision of regulated energy services makes them unsuitable for informing the equity beta parameter.
	Neither the international data nor the data on Australian 'infrastructure stocks' make suitable comparator data for informing the point estimate of the differences between these stocks and the characteristics of the BEE.	CCP16[1257]	
	It is very difficult to effectively 'normalise' international data, and it should be used only for information.	CCP16[1258]	
	The views of the investors' experts lead CCP16 to have concerns with the use of Australian infrastructure	CCP16[1259]	

[1254] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 19

[1255] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 19

[1256] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 19

[1257] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 68

[1258] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

[1259] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

Key point	Submission	Stakeholder	AER response
	businesses given, inter alia, many are privately owned in complex structures.		
	There is value in considering the broader Bloomberg Utilities Index which includes but goes beyond the three remaining listed networks.	CCP16[1260]	We agree.
	It is important to investigate the characteristics of any comparator firms as well as the changes in the structures of the existing network firms.	CCP16[1261]	We agree.
	The weight consideration given to the comparators should be reduced as their congruence with characteristics of the BEE reduces. For example: • Delisted Australian network firms could be considered if compared to equity betas of the three comparator firms up to the time that the firm de-listed. Once a firm is delisted, the equity beta will not change. If this does not occur, emerging risks and market cycles are unlikely to be properly accounted for. • International energy network firms should only be used if considered in the context of varying regulatory, economic and political environments between geographies and should be calibrated to the three Australian comparators over time.	NSG[1262]	We consider de-listed firms can still provide (historically) accurate and reliable information. We consider International estimates carry a range of differences with the BEE with a similar degree of risk to the relevant service provider in the provision of regulated energy services so we only use it as a cross checking tool.
	Reliance on Australian	QCOSS[1263]	We disagree. We consider empirical estimates from

[1260] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

[1261] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

[1262] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 15

Key point	Submission	Stakeholder	AER response
	regulated energy utility information makes the calculated WACC inherently less reliable.		firms that mostly close resemble a BEE with a similar degree of risk to the relevant service provider in the provision of regulated energy services should be main determinant in informing the equity beta.
	The broader problem is that the equity beta is set based on a narrow comparator group and can easily be distorted by a few data points. In our view it is it is more appropriate to assess the reasonableness of the equity beta and the overall rate of return based on observations of whether networks are over-investing than on the basis of a very restricted range of Australian energy utility firms. The pattern of investment of networks in the market is a supporting reliable guide to setting the equity beta and rate of return than observations of a restricted group of near and not-so-near comparators.	QCOSS[1264]	
De-listed firms should be excluded from comparator set	They do not reflect prevailing market conditions	CKI[1265] ENA[1266] [1267]	We consider that they still provide (more) reliable and (historically) accurate information on the systematic risk of a BEE with a similar degree of risk as a relevant service provider in the provision of regulated energy services. Neither could be said with certainty for international energy firms and other Australian infrastructure firms. Experts at the concurrent expert evidence session agreed that equity beta for is relatively stable because the true systematic risk is likely to be stable.[1268] To the extent systematic risk remains stable, de-listed firms should provide useful information for informing the equity beta parameter. Further, we estimate a long term WACC, this supports the use of long term data.
	The evidence presented in the AER's Equity Beta Discussion Paper is that the beta estimates for all live firms have increased since 2013, but (of course) the beta estimates for the delisted firms have remained frozen. When both sets are included in the sample, the 'dead' firms dampen the increase that the AER has documented for the 'live' firms.	ENA[1269]	
Return on equity should be adjusted	Actual returns for low beta stocks tend to exceed	APGA, CKI, ENA, Ergon,	We acknowledge that ex-post return data can indicate that actual returns exceed expected returns

[1263] Queensland Council of Social Service, Submission on review of Rate of Return Guideline, May 2018, p. 18
[1264] Queensland Council of Social Service, Submission on review of Rate of Return Guideline, May 2018, p. 18
[1265] Cheung Kong Infrastructure, AER Issues Paper – Review of the rate of return guideline, 12 December 2017, p. 5.
[1266] Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 31.
[1267] Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 62.
[1268] Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 51.
[1269] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 62

Key point	Submission	Stakeholder	AER response
for low beta bias	expected returns	Energex, NSG, SAPN, Vic Power Networks, AGN[1270] [1271] [1272] [1273]	for low beta stocks. However, given the lack of substantively new material, our considerations for giving no weight to low beta bias in our 2013 Guidelines and subsequent regulatory decisions also remain relevant: • Many of the tests and exercises which indicate low beta bias are themselves the subject of ongoing academic debate and carry limitations which throws doubt on their results and suitability for our regulatory task[1274] • There are a number of explanations (for example, economic conditions) that do not imply a bias in equity beta[1275] • It is also not clear that the low beta bias exists on an ex-ante basis or accounted for by investors and market practitioners on the same basis.
	(More explicit) adjustment should be made for the low beta bias	Evoenergy. APA, ENA[1276]	We did not adjust for low beta bias in the 2013 Guidelines and we maintain that approach in this review.
	Experts were in unanimous agreement on the existence of low beta bias and 'ignoring' it due to concerns with the empirical reliability of the Black CAPM would not be prudent.	APGA[1277]	We note that we set an ex-ante rate of return. It is not clear that the low beta bias exists on an ex-ante basis or accounted for by investors and market practitioners on the same basis. There are also issues with ex-post tests of performance. The Black CAPM and low beta bias are two different concepts. We did not and do not give

[1270] Australian Pipeline and Gas Association, Submission to the Issues Paper: AER review of the rate of return guideline, 12 December 2017, p. 9; Cheung Kong Infrastructure, AER Issues Paper – Review of the rate of return guideline, 12 December 2017, p. 5; Energy Network Australia, AER Rate of return guidelines response to issues paper, 12 December 2018, p. 31; Ergon Energy and Energex, AER Issues paper review of the rate of return guidelines Ergon Energy and Energex submission, 12 December 2017, p. 6; Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 59; Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 58.

[1271] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9.

[1272] SAPN, Victorian Power Networks, Australian Gas Infrastructure Group, AER Discussion Papers – Review of the Rate of Return Guideline, 4 May 2018, p. 6.

[1273] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 15.

[1274] AER, Rate of Return Guidelines Explanatory Statement Appendices, December 2013, pp. 11–12; For example, SAPN final decision, p. 288.

[1275] For example, SAPN final decision, p. 285

[1276] Evoenergy, Review of rate of return guideline –evidence sessions, 4 May 2018, p. 3; APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018; Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9.

[1277] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 8.

Key point	Submission	Stakeholder	AER response
			consideration to the Black CAPM to account for the low beta bias.
	AER risk unbalanced treatment of evidence if it adopts Stephen Satchell's advice on interest rate movements when it rejected the Fama French Model.	APGA[1278]	We consider all submissions, materials and evidence on their strengths, weaknesses and suitability for our regulatory task. This necessarily entail giving the relevant weight to evidence that we consider are relevant for our task.
	Ignoring actual returns entirely because actual returns are different to expectations … does not appear to be an adequate response.[1279] It noted that the 'usual' way to address the problem the AER faces in respect of the low beta bias is to use actual returns to adjust models like the CAPM.[1280]	APGA[1281]	We need to consider what is causing actual returns to differ from expectations and if these factors are priced by investors on an ex-ante basis. Partington and Satchell has noted that this could be due to economic shocks, business cycle and other factors in their previous advice.[1282] Mr Ilan Sadeh noted this could be due to outperformance on items associated with non-systematic risks such as operating expenditure.[1283] As a result, it is not clear to us that historical outperformance warrant adjustment to the expected rate of return.
	The AER should consider the empirical results of low beta bias (even if they can be wide ranging) instead of using judgement or theory.[1284] The APGA noted that best approach we have seen in the Australian regulatory context is that undertaken by HoustonKemp for Multinet in its most recent proposal.[1285]	APGA[1286]	It is not clear that the low beta bias exists on an ex-ante basis or is accounted for by investors and market practitioners on the same ex-ante basis. Our analysis of broker and valuation reports support this. Further the low beta bias could be attributed to a number for factors (economic shock, outperformance on opex) that do not necessarily warrant compensation through the rate of return.
	Disregarding the low beta bias would decrease investor returns which may deter investment and would not be in the long run interests of consumers.[1287]	APGA[1288]	We disagree with the use of ex-post data for a number of reasons including interest rate movements and economic shocks can all lead to ex-post returns diverging from expected returns. We have responded to the HoustonKemp report in the draft decision for Multinet and continue to disagree for similar reasons.
	The Guideline should	APGA[1290]	

[1278] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1279] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1280] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1281] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1282] Partington and Satchell, Report to the AER: Discussion of submissions on the cost of equity, 8 June 2017, pp. 29–30.
[1283] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 53.
[1284] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1285] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1286] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1287] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 7.
[1288] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 7.

Key point	Submission	Stakeholder	AER response
	examine and account for the low beta bias as it has been observed in practice and academic research.[1289]		
	There are issues with the "expected equilibrium" framework espoused by Partington and Satchell because it ignores actual returns, investors may not form equilibrium expectations, and it may not be the equilibrium indicated by the SLCAPM.	APGA[1291]	The substance of the APGA's statement is that the AER should use actual returns when estimating the return on equity and the AER's use of the Sharpe-Lintner CAPM when the market is not in equilibrium is incorrect. We have determined that the Sharpe-Lintner CAPM should be used as the foundation model for estimating the return on equity because it will contribute to the achievement of the ARORO. This has been upheld by the Tribunal. We do not agree with the use of ex-post data to adjust the Sharpe-Lintner CAPM estimates. Such a method assumes that 'markets are efficient and in equilibrium, hence realised returns are an appropriate benchmark'.[1292] However, as noted above, realised returns can diverge from expected returns for a number of reasons (such as economic shocks, interest rate movements, etc.) which do not necessarily warrant an adjustment on an ex-ante basis.
	The AER has recognised the existence of low-beta bias and has stated that it will use the Black CAPM to inform the equity beta estimate so as to "mitigate possible low beta bias	ENA[1293]	We disagree. In the 2013 Guidelines we gave a role to the theory of the Black CAPM to capture possible market imperfections that may lead to actual returns to differ from expected returns. We did not, and do not, give weight to low beta bias.
	This observation has been referred by as "low beta bias" in the CAPM, although estimates of β are not, themselves, biased.	APA[1294]	We agree.
	When developing the current Rate of Return Guideline, the AER sought to "correct" this low β bias by appeal to the theory of the Black CAPM.	APA[1295]	We did not give weight to low beta bias in the 2013 Guidelines.

[1290] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1289] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 9.
[1291] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, pp. 24
[1292] Partington and Satchell, *Report to the AER: Discussion of submissions on the cost of equity*, 8 June 2017, p. 17.
[1293] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 59
[1294] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 24
[1295] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 25

Key point	Submission	Stakeholder	AER response
	Instead of using the Black CAPM, the AER has opted for a qualitative method of recognising the effect of low beta bias associated with use of the CAPM.	APA[1296]	
	Simon Wheatley proposed that the AER adjust the β for the benchmark efficient entity for the higher returns on low β companies. The adjustment should rely on empirical evidence, and not the theory underlying the Black CAPM. The method of adjustment proposed by Multinet Gas in its last access arrangement revisions proposal (which, we understand, was in part developed by Dr Wheatley) should be reconsidered by the AER.	APA[1297]	It is not clear that the low beta bias exists on an ex-ante basis or is accounted for by investors and market practitioners on the same ex-ante basis. Our analysis of broker and valuation reports support this. Further the low beta bias could be attributed to a number for factors (economic shock, outperformance on opex) that do not necessarily warrant compensation through the rate of return.
The Black CAPM	The AER should have continued regard to the Black CAPM.	ATCO gas, Spark, APA[1298]	Shortcomings identified in the 2013 Guidelines continue to indicate that the Black CAPM is unsuitable for our regulatory task including unreliability, not widely used in practice and unrealistic assumptions. These shortcomings have been reinforced by material and evidence that we have received since the 2013 Guidelines. Partington and Satchell have consistently advised against the Black CAPM since the Guideline. If we cannot have confidence in the model's results and it is not used by practitioners and investors, then we do not consider it appropriate to select an equity beta towards the top of the observed empirical estimate for this model.
	The AER should maintain the weight to the Black CAPM.	ENA[1299]	
	The AER is assuming that the "zero beta" rate is 2.8 per cent higher than the risk free rate.	CRG[1300]	We used the theory of the Black CAPM to select a point estimate towards upper end of the range in the 2013 Guidelines.

[1296] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 26.

[1297] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 27.

[1298] ATCO gas, Re: Review of rate of return guideline-issues paper, 12 December 2017, p. 8–9; Network Shareholder Group, Re: Response to issues paper on the review of the rate of return guideline, 12 December 2017, pp. 9-10; APA, Review of the rate of return guidelines APA submission responding to AER issues paper, 12 December 2017, p. 11.

[1299] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9.

[1300] CRG, CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 50.

Key point	Submission	Stakeholder	AER response
	That is an extremely high value — it not only assumes the investor can't access funds at the risk free rate, but that the spread they face is about that of a BB rated entity. Accordingly the CRG believes that little to no weight should be given to the Black CAPM in determining the beta for the benchmark efficient entity.		
	To date, the AER has not specified what adjustment it has made in relation to the Black CAPM evidence, nor what slope it considers to be reasonable that if the same adjustment was made to a starting point beta estimate above 0.5, the final beta allowance would be above 0.	ENA[1301]	We have transparently set out the considerations we gave to the theory of the Black CAPM in the 2013 Guidelines and subsequent regulatory decisions: it is used to select a point estimate towards the upper end of the empirical range.
	As the AER has pointed out, considerable difficulties associated with obtaining reliable estimates of the return on the zero-beta portfolio.	APA[1302]	We agree with APA that there are a range of difficulties with obtaining reliable estimates of the return on the zero-beta portfolio.
	There is too much uncertainty around the empirical analysis of the Black CAPM theory for it to play a substantive role in the AER's decision, and is not generally applied by market practitioners or regulators.	CCP16[1303]	We agree.
	The theory of the Black CAPM/low beta bias: CCP16 notes the theory of the Black CAPM/low beta bias and its derivation based on ex-post empirical assessment of actual outturns. However, this is not an unbiased estimate of ex-ante expectations.	CCP16[1304]	We note that the low beta bias and Black CAPM are two different concepts but both use ex-post return data to make adjustments to parameters. We agree that the Black CAPM and the low beta bias should not be relied on to select a point estimate the upper end of our observed empirical range.

[1301] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 60

[1302] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 25

[1303] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 68

[1304] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

Key point	Submission	Stakeholder	AER response
	Moreover, there is significant variability in the proposed zero beta estimates, a variability that is consistent with the fact that neither the market nor regulators generally rely on the estimate. We do not, therefore, consider it is particularly suitable for estimating ex-ante the equity beta or for 'adjustment' to the empirical data.		
	It is possible to derive almost any value for the ROE ex ante, and this decision could be overly influenced by prior assumptions on the value of ROE. CCP16 concluded, therefore, that the Black CAPM is not an unbiased estimator of expected returns and is not suitable for selecting either a range or point estimate of expected returns. CCP16 also noted that neither the theory of the Black CAPM nor the associated estimates of the zero beta premium have been used by investment practitioners.	CCP16[1305]	We disagree with CCP16's view that one could derive almost any value for the ROE ex-ante. We estimate the risk free rate using the prevailing yield on the 10-year CGS averaged over a pre-specified period. We give foremost weight to market data (empirical estimates for equity beta and historical excess returns for MRP) when estimating equity beta and MRP. We agree that we should not select an equity beta towards the upper end of our empirical observed range for the (theory of the) Black CAPM.
	The Black model is inconsistent with other models such as the foundation model used by the AER.	QCOSS[1306]	
Firm and portfolio estimates	The estimates indicate a difference between the β for the one (predominantly) pipeline service provider, APA Group, and (predominantly) electricity service providers Spark Infrastructure and AusNet Services. This apparent difference is a	APA[1307]	We note that the difference would likely be driven by APA undertaking a range of transactions that would increase its exposure to systematic risk from unregulated assets and/or assets that are different from the risk of providing services with a similar degree of risk as the reference services.[1308] Evidence has not been provided to persuade to us that the systematic risk of supplying regulated gas and electricity services are sufficiently different to

[1305] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

[1306] Queensland Council of Social Service, Submission on review of Rate of Return Guideline, May 2018, p. 18

[1307] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 23

[1308] https://www.apa.com.au/about-apa/our-history/; http://www.duet.net.au/getattachment/ASX-releases/2015/DUET-Completes-Acquisition-of-Energy-Developments/DUET-Completes-Acquistion-of-Energy-Developments-L/DUET-Completes-Acquistion-of-Energy-Developments-Limited.pdf.aspx

Key point	Submission	Stakeholder	AER response
	caution against the use of β estimates of portfolios of extant businesses for estimation of either the return on equity of electricity service providers or gas pipeline service providers.		warrant separate equity beta estimates.
De/re-levering	Supports the current approach of de/re-levering.[1309]	ENA, NSG and APA.[1310] [1311] [1312] Stephen Gray, Simon Wheatley and Ilan Sadeh[1313]	We note that a firm's gearing level affects its equity beta estimate and our comparator firms have gearing that deviate from the benchmark level of 60 per cent. This requires de/re-levering to ensure they are on a like-for-like basis with the benchmark gearing to inform the systematic risk of a benchmark efficient entity with a similar degree of risk as a relevant service provider in respect of the provision of regulated services. As a result, we maintain the decision to de-lever and then re-lever equity beta estimates to 60 per cent gearing for our empirical analysis.
	Concerns about the re-leveraging process due to the leverage ratio as the common practice of market value of equity and book value of debt is not always a reasonable approximation.	Graham Partington[1314]	
	The AER uses the Miles and Ezzell formula for de/re-levering.	Stephen Gray, Simon Wheatley, Ilan Sadeh and ENA[1315]	We use the Brealey Myers formula as shown in the 2013 Guidelines. We observe the Miles and Ezzell formula in the joint expert report and it differs from the Brealey-Myers formula. It appears that the other experts' and ENA's submission may not take issue with the actual formula we use but rather the name. We reiterate that we use the Brealey–Myers formula for de/re-levering equity beta estimates.
	The AER uses the Brealey Myers formula.	Graham Partington	
	In APA's view, the issues raised by Associate Professor Partington with de/re-levering are all valid. How they might be addressed – if, indeed, they need to be – is less clear. The list of alternative	APA[1316]	As discussed in section 8.3.6, we consider it appropriate to de/re-lever equity beta estimates to allow like-for-like comparison between firms with different levels of actual gearing. We also consider to use a debt beta of zero as it appears market practice.

[1309] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 14

[1310] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 21.

[1311] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9, 49.

[1312] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 14

[1313] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 11, 12, 13.

[1314] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 7.

[1315] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46, 50

[1316] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 21

Key point	Submission	Stakeholder	AER response
	models for delevering and relevering is long, the evidence on debt βs is much less extensive and less robust than the evidence on equity βs, and abandoning the assumption of constant leverage raises difficult questions about what should be assumed.		
	CCP16 questions whether the benefits outweigh the risks in practice of de/re-levering, given that: The actual gearing is relatively close to the BEE target of 60 per cent; and The actual leverage does not appear to affect the network' credit ratings (within a reasonable range of 60 per cent to 75 per cent leverage).	CCP16[1317]	We note that a firm's gearing level affects its equity beta estimate and our comparator firms have gearing that deviate from the benchmark level of 60 per cent. This requires de/re-levering to ensure they are on a like-for-like basis with the benchmark gearing to inform the systematic risk of a benchmark efficient entity with a similar degree of risk as the relevant service provider in respect of the provision of regulated services. As a result, we maintain the decision to de-lever and then re-lever equity beta estimates to 60 per cent gearing for our empirical analysis.
	The use of leverage to 'normalise' the gearing to the regulatory 60 per cent raises many questions as indicated by the debate in the concurrent evidence session. CCP16 considers Partington and others have a good case to use the raw estimates of beta for the networks, although this raises other issues in the context of expanding the comparator set.	CCP16[1318]	
Estimation period	The changes in β appear, to APA, to be dampened by the use of the longest available data series for estimation. The experts were agreed that long data series provide more precise estimates but, if beta were changing, the use of shorter series for estimation might be appropriate.	APA[1319]	We consider it is helpful to use a variety of sampling periods and estimation techniques in our empirical study to estimate equity betas for firms we consider most comparable to the firms/assets we regulate. We have most weight to long term estimates to mitigate short term volatilities and one-off events that could obscure the true equity beta of a firm in the supply of regulated energy network services. We consider that the concurrent expert evidence

[1317] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 68

[1318] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

[1319] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 24

Key point	Submission	Stakeholder	AER response
	Weight might be given to the data from delisted firms to augment the size of the sample for β estimation. But β variation over time cannot be ignored, and older data become less relevant if estimates are to reflect prevailing financial market conditions. β estimation using five years of monthly data should allow closer examination of changes, if any, over time		session supported our estimation periods as experts noted that equity beta is relatively stable as true systematic risk is likely to be stable.[1320] As a result we consider it appropriate to maintain the current estimation periods.[1321]
	Submissions from non-network stakeholders have generally cautioned against reliance on short term estimates of equity beta.	CCP16, Ian McAuley, Canegrowers [1322]	
	Experts noted that a long data series are likely to produce the most statistically reliable estimates while others noted that a shorter period (e.g. 5 years) may reflect more recent movements.	Expert joint report[1323]	
Debt beta	Debt beta would have no material impact on the final estimate of equity beta	Stephen Gray, Ilan Sadeh, Simon Wheatley, ENA[1324]	The debt beta should continue to be zero. It appears market practice to assume a debt beta of zero and Damodaran has made the same assumption in his works. Further, the debt beta of businesses in the provision of regulated energy network services are likely to be low due to the relatively low risk of provisioning regulated energy network services.
	It is common to use a debt beta of zero in practice	Sadeh, ENA[1325]	
	A debt beta of zero would lead to an upward biased beta	Graham Partington[1326]	

[1320] Cambridge Economic Policy Associates, Expert Joint Report, 21 April 2018, p. 51.

[1321] AER, Rate of Return Guidelines Explanatory Statement Appendices, December 2013, p. 49.

[1322] Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 96; Ian McAuley, Submission to Australian Energy Regulator on rate of return guidelines, December 2017, p. 3; Canegrowers, Submission to AER review of the rate of return guideline, 19 December 2017, p. 4; Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 83.

[1323] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 50.

[1324] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46.

[1325] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 46.

[1326] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 1, 15 March 2018, p. 41

Key point	Submission	Stakeholder	AER response
	estimate.		
Use other information for equity beta	While firms like the BEE do face systematic risk, they have mechanisms available to them to manage this which are not available to other firms…. As all firms operating in the competitive market face these risks, the market data used to generate the parameters in the CAPM include full exposure to all these risks.	CRG[1327]	We consider that the use of market data is appropriate for estimating equity beta. The rate of return needs to have regard to the prevailing conditions in the market for equity funds[1328] and that is best measured through market data. Further, the rate of return needs to reflect the efficient cost of finance. We consider that efficient financing costs are more likely to be reflected in the prevailing market cost of capital. Experts agreed that beta should be estimated from stock market data.[1329] Partington and Satchell have also cautioned against using non-market data (such as cashflows) for estimating equity beta. They noted there is a paucity of data (due to cashflows being reported on annual basis) and there would be many difficulties to overcome.[1330]
	David Johnstone raised using regulated cashflows to estimate beta.		
	It is not clear why equity beta is an acceptable surrogate on which to base the fundamental risks faced by a network as share price volatility for defensive stocks such as networks is driven more by share traders seeking the maximise their profitability and minimise their losses and less by the risk fundamentals of defensive stocks.	CRG[1331]	
	Equity betas used in developing the equity beta for the BEE are overstated as the equity beta does not account for the risks that network firms can pass to consumers through the rules.	CRG[1332]	We have considered the impact of regulation on equity beta as part of our empirical update and selection of point estimate.
Estimation technique	The OLS estimator of bi is the sample estimate of βi = cov(ri, rM)/var(rM). The LAD estimator does not have this correspondence with the economic meaning of the parameter being estimated.	APA[1333]	We maintain the use of LAD as a robustness check.

[1327] Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 45

[1328] For example, see NER 6.5.2 (g)

[1329] Cambridge Economic Policy Associates, Rate of Return Guideline Review – Facilitation of Concurrent Expert Evidence: Expert Joint Report, 21 April 2018, p. 42.

[1330] Partington and Satchell, Report to the AER: Allowed rate of return 2018 Guideline review, 25 May 2018, p. 14.

[1331] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 48

[1332] CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 48

[1333] APA, Review of the rate of return guidelines APA submission responding to discussion papers and expert evidence, 4 May 2018, p. 22

Key point	Submission	Stakeholder	AER response
	The LAD estimator does not provide an estimate of β. β estimation should use the Ordinary Least Squares method		
Range and point estimate	Focus on the use of market practice, advice from Partington and Satchell and reducing the weight given to the Black CAPM.	CCP16, ECA, EUAA[1334]	We place most weight on empirical estimates (based on market data) for informing equity beta. After further considerations, we are not persuaded to select an equity beta towards the upper end of the observed empirical range for the (theory of the) Black CAPM.
	More transparency in the selection of range and point estimate.	Ergon and Energex, Spark, Evoenergy, APGA[1335] and Stephen Gray	We have transparently set out our approach in the selection of range and point estimate. We give most weight to our empirical study and international estimates and conceptual analysis are used in a cross checking role.
	The AER's current approach does not make sense because the range should not bound the information from other evidence. He noted that it would be better to set out and consider all evidence on equal footing.[1336]	Stephen Gray	We have transparently set out our assessment of and weight given to each piece of relevant evidence in accordance with step 2 of our foundational model approach. We have done so in the 2013 Guidelines, subsequent regulatory decisions, and this decision. We have set out all the relevant evidence equally in step 2 of our decision and the weight given to a piece of evidence is based on its strengths, weaknesses and suitability for our regulatory task. To give equal weight to all relevant evidence ignores the fact that some material is better suited in a qualitative role.
	Consumer groups submitted for a point estimate of 0.6 and below.	ECA, CRG, CCP16[1337]	We have had regard to all the relevant evidence in accordance with the weight we give them after assessing their strengths, weaknesses and suitability for our regulatory task. This leads us to set a point estimate of 0.6 from a range of 0.4–0.8.
	Service providers, investors and network associations espoused an equity beta of	ENA, Evoenergy, NSG[1338] [1339] [1340]	

[1334] Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 89; Energy Consumers Australia, Review of the rate of return guideline response to the AER Issues Paper, December 2017, p. 23, 27; EUAA, EUAA submission – AER rate of return review issues paper October 2017, 18 December 2017, p. 9.

[1335] Ergon Energy and Energex, AER Issues paper review of the rate of return guidelines Ergon Energy and Energex submission, 12 December 2017, p. 2; Network Shareholder Group, Re: Response to issues paper on the review of the rate of return guideline, 12 December 2017, pp. 9-10; Evoenergy, Review of rate of return guideline –evidence sessions, 4 May 2018, p. 3; APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 3.

[1336] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 43.

[1337] Energy Consumers Australia, Review of the rate of return guideline response to the AER Issues Paper, December 2017, p. 27; CRG, Submission to the Australian Energy Regulator Rate of Return Guideline Review, May 2018, p. 51, 68; Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 68.

Key point	Submission	Stakeholder	AER response
	0.7 and above.		
	The AER should start from the 2013 Guidelines' estimated value of 0.7 and let evidence indicate any changes to this point estimate.	Stephen Gray[1341]	Simply starting from a value of 0.7 would discount a range of relevant considerations, including: • those from the 2013 Guidelines that indicated a range of 0.4–0.7 and supported a (possible) point estimate towards the lower value within this range • information we have received since the 2013 Guidelines on relevant evidence. The 2013 Guidelines selected an equity beta point estimate of 0.7 having regard to the theory of the Black CAPM and international estimates. As discussed in section 8.3.5 and 8.3.4, we are not persuaded to select an equity beta towards the upper end of our observed empirical range for the (theory of the) Black CAPM and we use international estimates qualitatively in a cross-checking role. • Professor Satchell also disagreed with Professor Gray's proposal as that would discard information that supported lower values and may misconstrue the 0.7 as the mid-point of a range.[1342] (Satchell, 44, 35
	The remaining listed firms should be used to form an estimate and confidence interval with other information subsequently used to adjust the confidence interval to arrive at a point estimate.	APGA[1343]	We disagree with the use of confidence intervals for reasons we have previously outlined.[1344] These reasons include: • The presence of outliers can affect point estimates and their associated confidence intervals. • The presence of autocorrelation and heteroskedasticity creates difficulties in discerning whether confidence intervals overstate or understate the upper bound estimate.[1345]

[1338] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 60, 63; Evoenergy, Review of rate of return guideline – evidence sessions, 4 May 2018, p. 3; APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 5.

[1339] CKI, AER discussion papers-review of the rate of return guideline, 4 May 2018, p. 6.

[1340] Network shareholder group, Submission on the Rate of Return Guideline (RORG) review from the Network Shareholder Group (NSG), 4 May 2018, p. 14.

[1341] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 44.

[1342] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 44.

[1343] APGA, Submission to the AER review of rate of return guideline, 4 May 2018, p. 6.

[1344] AER, *Final decision: WACC review*, May 2009, pp. 286-290.

[1345] Autocorrelation is present when the errors in the regression have a relationship or trend with errors in the past. Heteroskedasticity is where the variance in the errors is not constant (over time or as the values of the independent variables change).

Key point	Submission	Stakeholder	AER response
			• Confidence intervals are less likely to represent the 'true' equity beta point estimate, compared to the range of point estimates derived from different samples and sampling periods.
	Experts discussed setting confidence interval and a point estimate for individual parameters which is then used to set a point estimate and a confidence interval for the WACC. Other (qualitative) information can be used to select the end WACC from the confidence interval (p 133	Expert evidence session[1346]	We consider the intent of the method discussed by experts is not dissimilar to the foundational model approach. The focus is on using other information to triangulate and perform a reasonableness check on the end estimate. Step 5 of our foundational model approach compares our return on equity against information from other relevant evidence to assess the reasonableness of our estimate.
	Submissions from non-network stakeholders have generally cautioned against reliance on short term estimates of equity beta.	CCP16, Ian McAuley, Canegrowers[1347]	We agree. Hence we place most weight on estimates from the longest estimation period.
	RAB multiples and profitability metrics have no useful role to play in the estimation of equity beta.	ENA[1348]	We agree that these measures may not at the parameter level but may apply at the overall return on equity level.
	The international evidence considered by the AER all indicates an equity beta above 0.7.	ENA[1349]	We now use international evidence as a cross check for our empirical range following further consideration of this evidence. Our update indicate that international estimates cluster below 1.0 and support range of 0.4–0.8.
	Evidence from other domestic infrastructure firms all indicates an equity beta above 0.7.	ENA[1350]	Our consideration is to give no weight to this material for informing the equity beta estimate. This is because of a range of differences with firms supplying the regulated energy services.
	The only evidence that supports maintenance of the	ENA[1351]	We have most regard to longest period estimate which support a value of 0.5–0.6. We also note that

[1346] AER, Transcript of proceedings Australian Energy Regulator Office: Review of rate of return guidelines concurrent expert evidence session 2, 5 April 2018, p. 126–127, 128–133.

[1347] Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 96; Ian McAuley, Submission to Australian Energy Regulator on rate of return guidelines, December 2017, p. 3; Canegrowers, Submission to AER review of the rate of return guideline, 19 December 2017, p. 4; Consumer Challenger Panel (sub-panel 16), Submission to the AER on its rate of return guideline issues paper, December 2017, p. 83.

[1348] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9

[1349] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9

[1350] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9

[1351] Energy Networks Australia, AER review of the rate of return guideline response to Discussion Papers and concurrent expert evidence sessions 4 May 2018, p. 9

Key point	Submission	Stakeholder	AER response
	same equity beta as in 2013 is the evidence from delisted firms, whose beta estimates are frozen in time forever.		de-listed firms can provide useful information.
	We do not accept that the AER should select a figure at the top of the empirical range. CCP16's analysis demonstrates that the AER should no longer err on the side of regulatory caution. The balance between investment risk and consumer price risk has shifted, as prices have risen and the market growth has stalled. CCP16 now strongly recommends that the AER adopt a more balanced view on each of the parameters including the equity beta.	CCP16[1352]	
	When each of the AER's discussion paper estimates is considered independently, two thirds of the above estimates are less than 0.6. In addition, the mean and median values of the estimated betas across scenarios, methods and portfolios are also less than 0.6. The AER also very usefully considered betas at a sector/industry level using Bloomberg's industry data. The Utility index, which included the 3 remaining listed networks in the top 5, indicated an equity beta of around 0. 6. CCP16 believes that the AER can no longer ignore the weight of evidence pointing to an equity beta of less than 0.7. However, we are aware of a range of other considerations for the AER and also posited by the networks and their	CCP16[1353]	We have reviewed evidence and submissions as part of this review. Our updated empirical estimate support a range of 0.4–0.8. We now have regard to a range of information to inform the point estimate. Our international estimates and conceptual analysis support our range and point estimate. We are not persuaded to select a point towards the upper end of our observed empirical range for the (theory of the) Black CAPM.

[1352] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 69

[1353] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 16

Key point	Submission	Stakeholder	AER response
	consultants.		
	It is essential that a long-term data series is used, as on balance and noting the risks of this, the task of the AER is to estimate ex-ante the long-term beta and to see through the ups and downs of annual data and short-term trends	CCP16[1354]	We agree. As a result we give most weight to empirical estimates from the longest estimation period. We consider that short term data is more likely to be unduly affected by one-off events, interest rate movements and volatilities which may obscure the true equity beta of a firm in the supply of regulated energy services.
	The majority of the empirical estimates of the beta for both the individual and portfolio network firms sit around a median value of 0.5 to 0.6 (using the AER's 2017 analysis), and the Bloomberg Utility index also sits around a median value of 0.5 to 0.6.	CCP16[1355]	We have updated our empirical analysis to 2018. Our results indicate that estimates cluster around the 0.5–0.6 range.
	APA's results indicated that there might be a change in the last five years in the systematic risk. This result is not, however, surprising given the substantial change in APA's revenue sources and business plans. Indeed, it would be surprising if moving more into the energy sector would not increase the equity beta of APA given the considerably higher average beta of that sector compared to the utility sector AusNet Services (AST) has also shown increase in the equity beta which is difficult to explain on the basis of fundamentals of the company.	CCP16[1356]	In previous regulatory decisions, we have noted that recent movements in equity beta estimates may not necessarily reflect a change in the systematic risk of supplying the regulated energy network services.[1357] This because some of the of the still-listed firms have undertaken a range of transactions that would increase their exposure to systematic risk from unregulated assets and/or assets that are different from the risk of providing services with a similar degree of risk as the reference services.[1358] Further we have noted that interest rate movements would likely drive the equity beta estimates due to the comparator firms being considered bond proxies. Due to these considerations, and our concerns with short term estimates in general, we give most weight to estimates from the longest estimation period.

[1354] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 70

[1355] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 16

[1356] Consumer challenger panel 16, Submission to the AER on its rate of return guideline review concurrent evidence sessions, 4 May 2018, p. 85

[1357] AER, APA VTS final decision Attachment 3 Rate of Return, November 2017, p. 255.

[1358] https://www.apa.com.au/about-apa/our-history/; http://www.duet.net.au/getattachment/ASX-releases/2015/DUET-Completes-Acquisition-of-Energy-Developments/DUET-Completes-Acquistion-of-Energy-Developments-L/DUET-Completes-Acquistion-of-Energy-Developments-Limited.pdf.aspx

9 Return on debt approach

In this chapter we discuss our overall approach to debt and the implementation of our approach to debt.

Our draft decision is to continue to adopt key elements of our current approach for estimating the return on debt. In particular, we will continue to:

- Adopt a benchmarking approach to estimating the allowed return on debt, which manifests in a benchmark:
    - Term of debt. We discuss the choice of the benchmark term to maturity of ten years in section 10.3.
    - Credit rating. We discuss the choice of the benchmark credit rating of BBB+ in section 10.1.
- Adopt a 10-year trailing average return on debt (based on a 10 year term to maturity) and update return on debt estimation annually.
- Adopt a 10-year transition between the previous 'on-the-day' approach and the 10-year trailing average. For clarity, our draft decision is to adopt a consistent transition approach across all networks we regulate. That is, where we have commenced the transition in a previous determination for a service provider, we will continue that transition. Where we have not yet commenced the transition, we will adopt the same form of transition as has been applied to the other networks.
- Estimate the return on debt by reference to published third-party yield curves.
- For each year of the 10-year trailing average, estimate the return on debt as the simple average of rates observed over a period of time nominated by the service provider to whom the allowed return on debt will apply.

Through their submissions and other correspondence to date, the majority of stakeholders have indicated support for these aspects of our approach. This is also consistent with our position, accepted by most stakeholders, that this review should be an incremental review. We consider that this provides the necessary certainty and predictability that stakeholders have said they value whilst allowing us to discharge our regulatory task in a manner that is most likely to contribute to the legislative objectives.

However, there is one aspect of our approach where some stakeholders have submitted an alternative, being our transition into the trailing average portfolio approach. Our consideration of these submissions is detailed in sections 9.1, 9.2 and 9.3 below.

We acknowledge that legislative amendments have been proposed that would make this Guideline binding. This would be unlike the 2013 Guidelines, for which the current legislative framework allows both service providers and ourselves the opportunity to depart from the 2013 Guidelines if the evidence justified that doing so would result in an outcome that better achieves the allowed rate of return objective. However, our current approach has been to adopt an annually updating return on debt approach.

Under the current rules framework, an annually updating return on debt is required to be given effect by automatic application of a formula. For this reason, our view is that implementation of a binding rate of return instrument requires only incremental changes to our current approach. On this basis, we have considered refinements to our averaging period criteria and list of contingency actions compatible with a binding rate of return instrument. These are detailed in sections 10.7 and 10.8.

9.1 Submissions on transition to the trailing average

Through their submissions and other correspondence to date, the majority of stakeholders have indicated support for maintaining a continued application of the trailing average portfolio approach with the transitioning period.[1359] At the same time, Network Shareholder Group[1360] and ATCO Gas Australia[1361] have expressed preferences for removing the transitioning arrangement.

Our draft decision is to maintain the current transitioning arrangement which is in place for the trailing average portfolio approach.

The trailing average portfolio approach was implemented with a transitioning period of 10 regulatory years for all service providers to allow a progressive change between two different approaches of setting the allowed return on debt - a transition from an 'on-the-day' approach to a 'trailing average' approach. Therefore we are currently in the midst of the transitioning period which commenced from the start of each service provider's first regulatory period after May 2014.

As we set out in our issues paper, based on the information currently before us, changing this approach will not contribute to the achievement of the national gas and electricity objectives. The subsections below outline our reasoning for maintaining the current approach to transitioning to the trailing average, and our response to submissions on the transition.

A trailing average with a transition will achieve the objectives

In chapter 2 we discussed the requirements in the national gas and electricity objectives, and the allowed rate of return objective, for our rate of return to promote efficiency. We outlined how the allowed rate of return will promote efficiency when it

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[1359] Australian Pipelines and Gas Association, Submission to the Issues Paper, December 2017, p4 – 6 Energy Networks Australia, AER Rate of Return Guideline, December 2017, p16-17, p19-20; Ergon Energy and Energex, Issues paper – review of the rate of return guidelines, December 2017, p4-5; Major Energy Users, Review of the rate of return guidelines, December 2017, p10-11, 15; APA, APA submission responding to AER issues paper, December 2017, p8; Cheung Kong Infrastructure, Submission on rate of return issues paper, December 2017, p3, Energy Users Association of Australia, EUAA submission – AER Rate of Return Review Issues Paper, October 2017, p8; AusNet Services, Review of Rate of Return Guideline – Issues Paper, December 2017, p1; Network Shareholder Group, Submission on the RoRG review, May 2018, p.11, Consumer Reference Group, Submission to the AER RoRG review, May 2018, p.41

[1360] The Network Shareholder Group refers to a consortium of network investors consisting of Spark Infrastructure, Hastings, AMP Capital, AustralianSuper, Macquarie Infrastructure and Real Assets, sand IFM Investors.

[1361] ATCO Gas Australia, Review of rate of return guideline – issues paper, December 2017, p6-7

reflects market rates and provides for ex-ante efficient compensation given the risks of providing regulated services.

We consider that a revenue neutral transition between the on-the-day approach and trailing average approach is necessary to achieve the national gas and electricity objectives, and the allowed rate of return objective. Without a revenue neutral transition our change in approach could increase a benchmark efficient entity's value, then this would benefit its equity holders at the expense of consumers. Conversely, if such changes decreased a benchmark efficient entity's value, then this would cost its equity holders but provide a short term financial benefit to consumers. As such, this methodological change may also have a negative impact on the confidence in the predictability of the regulatory regime.

We consider ex-ante efficient compensation can hold under either the on-the-day approach or the trailing average approach (if a transition is applied). As such, both approaches are capable of being approximately equivalent over the term of the RAB (which will be multiple regulatory periods).

However, under the trailing average approach, for any given regulatory period, the present value of expected net operating cash flows over the regulatory period plus the closing RAB will not necessarily equal the opening RAB. That is, at the start of any given regulatory period, the present value of expected future cash flows will unlikely equal the RAB because the cash flows based on historical interest rates will either be too high or too low (relative to the prevailing cost of debt in the market). Given this, switching between regimes without a full transition would not satisfy the requirement to provide service providers with a reasonable opportunity to recover at least efficient costs over either the regulatory period or over the term of the RAB.

As either the on-the-day or trailing average approach would contribute to the achievement of the ARORO, a switch between regimes that is accompanied by a revenue neutral transition will also contribute to the achievement of the ARORO. For a more thorough explanation, we refer to our final decision on the 2018-22 access arrangement determination for APA's Victorian Transmission System.[1362]

Previously, our approach to transition to the trailing average has been extensively contested in litigation. Most recently, our approach was upheld by:

- the Australian Competition Tribunal in its decisions on appeals from SAPN, the Victorian electricity distribution network service providers
- the Full Federal Court in its decision on SAPN's appeal of the Australian Competition Tribunal's decision.

These outcomes reinforce our view that a revenue neutral transition is necessary to advance the NEO and NGO.

[1362] See AER, *Final Decision APA VTS gas access arrangement 2018 to 2022 Attachment 3 – Rate of return*, November 2017, p327 - 347

Submissions for an immediate transition to the trailing average

In its submission on our October 2017 issues paper, the Networks Shareholder Group submitted that:[1363]

> …there should be no transition and there should be an immediate adoption of a trailing average methodology. The AER has acknowledged that a 10-year staggered portfolio of debt is an efficient debt strategy... there is no merit in adopting a transition which, by definition, prolongs an inefficient approach until some future date…many networks already manage their debt portfolios in this more efficient manner and may be penalised by a transition. This reduces the incentives to adopt an efficient approach unless it exactly matches the regulatory assumptions.
>
> ….NSPs have a right to an opportunity to recover efficient costs, including financing costs. A focus on revenue neutrality when it is the efficient costs, or assessment of efficiency costs, that is changing is inconsistent with this important principle under the National electricity and gas rule. A transition must consider the implications for recovering efficient costs and the incentives to deliver efficient outcomes both of which are required to promote the long-term interests of consumers.

We consider that a trailing average portfolio approach promotes efficiency by providing ex-ante efficient compensation over the term of the RAB. We have decided to adopt the trailing average portfolio approach and continue the transition to the trailing average from the on-the-day approach that was previously applied. However, we do not consider that the on-the-day approach was an inefficient approach.

The Network Shareholder Group submission refers to a 10-year staggered portfolio of debt as an efficient debt strategy and that service providers should be able to recover efficient costs.

However, as noted above, we consider that an allowed rate of return that meets the objectives must provide ex-ante compensation for efficient financing and provide a service provider with a reasonable opportunity to recover at least its efficient financing costs (sometimes referred to as the NPV=0 principle). Either the on-the-day-approach or trailing average approach will provide ex-ante efficient compensation over the term of RAB. The actual debt management practice by a service provider may differ from our regulatory approach, but this does not mean that our allowed rate of return does not provide ex-ante efficient compensation. As noted in our APA VTS determination, to the extent that there is a difference in debt management approach, interest rate risk is captured in the estimation of beta thus the overall rate of return is likely to provide efficient compensation to a service provider.

[1363] Network Shareholder Group, Response to issues paper on the review of the Rate of Return Guideline, December 2017, p8-9

One of the key factors in our decision to change from the on-the-day to the trailing average approach was a consideration that the trailing average may more closely match actual efficient financing practices, thereby reducing interest rate risk. However, this does not mean that we considered that the on-the-day approach would not provide ex-ante efficient compensation. We note that actual efficient financing practices adopted by service providers may differ from each other and that they may also change from time to time in response to factors such as market conditions, management strategies and policies, terms and conditions of legacy debt instruments, etc. Overall we consider that both the on-the-day and trailing average approaches provide ex-ante efficient compensation to satisfy the NPV=0 concept given effect in the RPPs.

Further, as we are now in a transitioning period, the majority of the service providers have adopted a debt management strategy that takes account of the regulatory approach, including the transition. Changing the current arrangement may impact on confidence in the predictability of regulatory arrangements.

We also note that the Tribunal in its decisions for ActewAGL (Gas) Distribution and Jemena Electricity Networks Ltd concluded that an on-the-day approach could be lawfully applied in those cases and that an immediate trailing average would not achieve the objectives or reflect efficient financing costs.[1364] Through this decision, the Tribunal concurred with our view that a non-revenue neutral position which would be brought on by an immediate change to trailing average would not satisfy the objectives.

ATCO Gas Australia submitted that the AER should consider reasoning given by ERA in moving directly to hybrid trailing average approach[1365]. In its final determination on the access arrangement for Mid-West and South-West Gas Distribution Systems in September 2015, the ERA determined that it was more appropriate to move directly to the hybrid trailing average approach without transition because:

> ...it recognises that there is no change required in hedging arrangements between the previous approach and the hybrid trailing average approach, as both involved a single estimate of the risk-free rate, set once at the start of the regulatory period. For the DRP, however it is likely that the benchmark efficient firm would have adopted a portfolio of debt with a ten-year average term, and that the firm would have been reasonably recompensated over the past three access arrangements, without being excessively compensated. However, a transition on the DRP would likely introduce a shortfall 'under' for the regulated firm over the AA4 period, which could then not be recovered as the full transition to the trailing average DRP occurred in the AA5 period[1366].

[1364] AER, Position paper: Remitted debt decisions for NSW/ACT 2014-19 electricity distribution determinations and Jemena Gas Networks 2015-20 (NSW) Access Arrangement, December 2017, p15

[1365] ATCO Gas Australia, *Review of rate of return guideline – issues paper*, December 2017, p6-7;

[1366] Economic Regulation Authority, Final decision on proposed revisions to the access arrangement for the Mid-West and South-West gas distribution systems, September 2015, p.353-354

The ERA's reasoning appears based on whether the change in approach from on-the-day to trailing average requires adjustments to existing hedging arrangements. Our rationale for transitioning to the trailing average is not based on the actual debt management practices of service providers. As stated above, we do not consider the actual debt management practices of service providers alters the extent to which the trailing average achieves the legislative objectives or whether a revenue neutral transition is required to achieve the legislative objectives. Rather, to the extent it is systematic, interest rate risk from differences between actual debt management practices and regulatory allowances is likely to be reflected in our equity beta estimate.

In relation to the definition of 'efficient debt financing costs', QTC sought confirmation of whether the views expressed by us in the 2017 final decision documents for APA VTS were intended to apply to the trailing average approach following the conclusion of the transition. The views in question relate to our definition of efficient debt financing costs in the context of the ex-ante nature of the regulatory scheme rather than past financing practices, and that an allowed return on debt that reflects the prevailing market cost of debt promotes efficient investment decisions[1367]. The interpretation of 'efficient financing costs' as an ex-ante concept was approved by the Tribunal in the ActewAGL (Gas) Distribution and Jemena Electricity Networks Ltd appeals of our May 2016 determinations[1368]. We consider that a rate of return that meets the legislative objectives must provide ex-ante compensation for efficient financing costs and this return would give a service provider a reasonable opportunity to recover at least its efficient financing costs. This is a zero net present value (or NPV=0) investment condition[1369]. We consider that this interpretation of efficient financing costs and the NPV=0 concept will continue to be relevant in transition as well as post-transition of the trailing average approach.

9.2 NT Power & Water's proposal for immediate transition

In its regulatory proposal for the 2019-24 period, NT Power & Water Corporation proposed a return on debt estimate based on a 10-year trailing average without any transition. NT Power & Water Corporation submitted that its current allowed rate of return is effectively already set as a 10-year trailing average and so an immediate adoption of the trailing average for its 2019-24 regulatory period would not result in a windfall gain or loss to consumers.

Our decision is to commence a 10-year transition to the trailing average in the first year of NT Power & Water Corporation's 2019-24 regulatory period, on the basis that:

[1367] Queensland Treasury Corporation, *Rate of return guideline review issues paper,* December 2017, p7

[1368] Australian Competition Tribunal, Application by ActewAGL Distribution [2017] ACompT 2, October 2017

[1369] SFG Consulting advice to the AEMC during the rule change process also supports the position that setting an allowed return that results in a zero NPV investment outcome is important to achieving efficient investment incentives. SFG Consulting, *Rule change proposals relating to the debt component of the regulatory rate of return*, 21 August 2012, p63-64

- NT Power & Water Corporation's current allowed rate of return is not set via an annually updating return on debt
- An immediate transition to the trailing average is unlikely to be revenue neutral.

NT Power & Water Corporation submitted that:

> We agree that a trailing average approach best serves the long-term interests of consumers. We also accept that a DNSP should not receive a windfall gain when adopting that approach – and consumers should not be asked to (effectively) pay twice for the same high period in the interest rate cycle.
>
> However, in our circumstances, we consider that adopting the trailing average approach immediately would not provide a windfall gain because unlike all other service providers regulated by the AER that we are aware of:
>
> - the allowed return on debt reflected in our current tariffs (~4.21%) is significantly below an on-the-day rate – and when averaged with the UC determined return on debt for the prior period (8.51%) gives a value (6.36%) that is consistent with the 10-year trailing average that we propose (6.37%), and
> - adopting a trailing average approach would not include rates observed during the peak of the Global Financial Crisis over 2008 and early 2009 – as the averaging period used to apply that approach need only stretch back to July 2009.

NT Power & Water Corporation submitted that the average of the allowed rates of return for its past two regulatory periods (2009-10 to 2013-14 and 2014-15 to 2018-19) give a similar result to a trailing average.

For the reasons set out in this chapter, we do not accept this submission. A key feature of our transition to the trailing average is that, in each year during which we update the trailing average portfolio, we do so by adding an estimate of debt based on the prevailing cost of debt. It is this feature of our approach that provides for revenue neutrality and satisfies the NPV=0 principle. In our view, NT Power & Water Corporation's proposed approach would be backward looking and incorporate past estimates of the cost of debt. For the reasons set out in our decision on averaging periods, we consider that selection of historical averaging period can introduce bias into outcomes. As a result, it is most likely that such an approach would lead to windfall gains or losses which would not be consistent with the NEO and NGO.

9.3 TasNetworks' proposal to alter its transition path

In its regulatory proposal for the 2019-24 regulatory period, TasNetworks proposed to align the allowed return on debt for both its distribution and transmission networks in a manner that affects their transition to the trailing average portfolio approach. Our decision is to:

- maintain the current transition paths for TasNetworks' transmission and distribution networks, and

- address the revenue impacts of aligning the allowed return on debt through other mechanisms available in our regulatory determination and annual pricing processes.

Previously, TasNetworks' transmission and distribution networks were regulated separately on different timetables. Now the two network decisions have been aligned. The current cost of debt for TasNetworks' transmission and distribution networks are not aligned because we commenced the transition to the trailing average portfolio approach at different times. This is because we commenced the transition at the start of the current determinations for transmission and distribution, and these determinations were made at different times.

Our current determination for TasNetworks' transmission network was made for a 2014-19 regulatory period. Our current determination for TasNetworks' distribution network was made for a 2018-19 regulatory period. Our next determinations for TasNetworks' transmission and distribution networks will both be for an aligned 2019-24 regulatory period.

Therefore, at the start of the 2019-20 regulatory year, TasNeworks' transmission network will be five years into a ten year transition, while its distribution network will be two years into a ten year transition. TasNetworks proposed to align the return on debt for its transmission and distribution networks by adopting the lower of the two. This will be the distribution network return on debt. TasNetworks proposed this adjustment to its return on debt to address consumer affordability concerns.[1370]

TasNetworks' proposal means that, in effect, TasNetworks' transmission network will have a transition to the trailing average that is:

- longer than ten years
- not the uniform, linear transition as set out in our 2013 Guidelines (there will effectively be a 'split' in the transition path occurring between the 2018-19 and 2019-20 regulatory years).

In section 9.1 above we set out why we consider a 10-year transition will be revenue neutral and therefore contribute to the achievement of the legislative objectives. For this reason, and for the benefits from predictability and maintaining less complicated guidelines, we consider that the guidelines should maintain the start and end dates for transition paths that we have already made in past regulatory determinations.

While our decision is to apply a consistent transition approach to all networks, we recognise that TasNetworks is proposing a revenue path below what it might otherwise be entitled to in seeking to promote the long term interests of its consumers. We will explore the use of other possible mechanisms to achieve this outcome with TasNetworks as part of our determination for their 2019-24 regulatory period.

[1370] TasNetworks, Tasmanian Transmission revenue and distribution regulatory proposal—Regulatory control period 1 July 2019 to 30 June 2024, January 2018, p. 166.

9.4 NSW and ACT determinations to be re-made

Where we have commenced the transition to the trailing average portfolio approach in a previous determination for a service provider, we will continue that transition.

For Ausgrid, Endeavour Energy, Essential Energy, Evoenergy (electricity distribution), and Jemena Gas Networks, we initially made determinations in 2015 that commenced this transition. However, these determinations were subsequently subject to a prolonged period of appeal and review, including review of our allowed return on debt approach. The Australian Competition Tribunal remitted these determinations back to us to be remade and directed us to reconsider our return on debt approach. These remitted determinations have not yet been remade. Consequently, it is not yet clear if these determinations will set out a start date for a transition to a trailing average.

The Essential Energy remittal determination has now been finalised, but the other remittal processes are ongoing.

For the avoidance of doubt, we will treat the first year of these determinations as the commencement of a transition to the trailing average for the purposes of applying a transition in subsequent regulatory periods.

We note that - for the purposes of their 2019-24 determinations - Ausgrid, Endeavour Energy, Essential Energy, and Evoenergy have all proposed to adopt a transition into the full trailing average. These service providers have proposed that the return on debt for the first year of their 2019-24 regulatory periods commence the transition at year 6 and then transition progressive each year through the full ten year transition period. We are yet to receive a regulatory proposal from Jemena Gas Networks to indicate their views.

The treatment of the transition for the purposes of the 2014-19 period is yet to be determined. Nonetheless, the proposals from the NSW and ACT service providers indicate that for the purposes of subsequent regulatory periods - which will be the periods subject to this rate of return guideline - the use of a transition and the start date for that transition is not contested.

9.5 Return on debt incentive scheme

The Major Energy Users Inc. submitted that we should consider implementing an incentive scheme for the return on debt, stating:[1371]

> While the benefits of improved reliability, opex and capex all now have incentives built into them where the benefits are to accrue to consumers, this does not apply to the cost of debt.

As noted in our chapter 2 we will apply a benchmarking approach that provides incentives service providers to outperform our allowed rate of return. We consider that

[1371] Major Energy Users, Submission on AER Rate of Return Issues Paper, December 2017, p. 10.

the ex-ante setting of an allowed rate of return provides incentives for service providers to undertake efficient financing practices. Benefits from this approach also accrue to consumers as we undertake regular reviews of our allowed rate of return and update our benchmarks accordingly. We have done this as part of this review, and have updated our empirical analysis of gearing ratios, credit ratings, service providers' actual debt costs, and equity beta estimates. We do not consider that an additional incentive scheme is required for the return on debt or any other aspect of the allowed rate of return.

9.6 Summary of submissions

This appendix details the submissions we have received from stakeholders as part of our review process to date, and notes how we have had regard to each submission.

Table 41 Summary of submissions on the return of debt approach

Key Point	Submission	Stakeholder	AER Response
The transition and trailing average approach	Support the transition to a trailing average approach	APGA,[1372] ENA,[1373] Ergon Energy & Energex,[1374] APA,[1375] CKI,[1376] EUAA,[1377] AusNet[1378]	Our draft decision is to maintain the 10-year trailing average and the approach to transition set out in the 2013 Guidelines. We consider that this provides the necessary certainty and predictability that stakeholders have said they value, whilst allowing us to discharge our regulatory task in a manner that is most likely to contribute to the legislative objectives.
	It is more appropriate to skip the transition and immediately move to the trailing average approach.	ATCO,[1379] Network Shareholder Group[1380]	We consider changing this approach will not contribute to the achievement of the national gas and electricity objectives. Our current approach on transition to the trailing average return on debt has been considered extensively in Australian Competition Tribunal and Full Federal Court decisions.
	Support the AER's ongoing commitment to the trailing	QTC[1381]	One of the key factors in our decision to change from the on the

[1372] Australian Pipelines and Gas Association, Submission to the Issues Paper, December 2017, p4-6
[1373] Energy Networks Australia, AER rate of return guideline, December 2017, p19-20
[1374] Ergon Energy and Energex, Issues paper - review of the rate of return guidelines, December 2017, p4-5
[1375] APA, APA submission responding to AER issues paper, December 2017, p8
[1376] Cheung Kong Infrastructure, Submission on rate of return issues paper, December 2017, p3
[1377] Energy Users Association of Australia, EUAA submission - AER Rate of return review issues paper, October 2017, p8
[1378] AusNet Services, Review of rate of return guideline - issues paper, December 2017, p1
[1379] ATCO Gas Australia, Review of rate of return guideline – issues paper, December 2017,p6-7
[1380] Network Shareholder Group, Response to issues paper on the review of the rate of return guideline, December 2017, p8-9
[1381] Queensland Treasury Corporation, Rate of return guideline review issues paper, December 2017, p3

	average approach Submits that the 10-year trailing average is consistent with the most prudent way to manage refinancing risk. Seeks confirmation that the AER's view that the ex-ante efficient financing cost with the NPV=o concept, would apply both in transition and in post-transition of the trailing average approach.	day to the trailing average approach was a consideration that the trailing average may more closely match actual efficient financing practices, thereby reducing interest rate risk. However, this does not mean that we concluded that the on the day approach would not provide ex ante efficient compensation. We consider that both the on-the-day and trailing average approaches with transition provide ex-ante efficient compensation to satisfy the NPV=0 concept given effect in the RPPs We confirm that the ex-ante efficient financing cost definition with the NPV=o concept applied in transition as well as in post-transition of the trailing average approach.

10 Implementation of our return on debt approach

In section 9 we set out our approach to estimating the allowed return on debt. In that section, and in our issues paper and discussion paper, we noted we would have regard to updated evidence to evaluate how we should implement our return on debt approach. In doing so we have:

- Updated credit rating and benchmark term data across the sector, detailed in sections 10.3 and 10.3 respectively.
- Assessed information on new third party data providers. This assessment is set out in section 10.4. Consideration of how to combine third party data to come to a benchmark return on debt is set out in sections 10.4 to 10.6
- Undertaken a 'sense check' of our current approach by reviewing actual return on debt instruments issued by service providers over 2013–17. As detailed in our discussion paper, our review of actual return on debt instruments raised issues relevant to our benchmark debt term and the implementation of our benchmark credit rating, and these are discussed in sections 10.3 and 10.5

We acknowledge that legislative amendments have been proposed that would make this Guideline binding. In section 9 we stated our decision is to set a formula for calculating the allowed return on debt, and that we currently use a formulaic approach to annually updating the return on debt. For this reason, our view is that implementation of a binding rate of return instrument requires only incremental changes to our current approach. On this basis, we have considered refinements to our averaging period criteria and list of contingency actions compatible with a binding rate of return instrument. These are detailed in sections 10.7 and 10.8 respectively.

10.1 Benchmark credit rating

Our draft decision is to adopt a benchmark credit rating of BBB+. We consider this is consistent with the available empirical evidence. Table 42 below shows the historical credit ratings for service providers from 2006 to 2018.

Table 42 Historical credit ratings of service providers

Issuer	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
APT Pipelines Ltd	NR	NR	BBB	BBB	BBB	BBB	BBB	BBB	BBB	BBB	BBB	BBB
ATCO Gas Australia LP	NR	NR	NR	NR	BBB	BBB	A-	A-	A-	A-	BBB+	BBB+
DBNGP Trust	BBB	BBB	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB	BBB
DBNGP Finance Co P/L	BBB	BBB	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB	BBB
DUET Group	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	NR	NR	NR	NR	NR	NR
ElectraNet P/L	BBB+	BBB+	BBB	BBB	BBB	BBB	BBB	BBB+	BBB+	BBB+	BBB+	BBB+
Energy Partnership (Gas) P/L	BBB	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB+	BBB+
Australian Gas Networks Ltd	BBB-	BBB-	BBB-	BBB-	BBB-	BBB-	BBB	BBB+	BBB+	BBB+	BBB+	BBB+
ETSA Utilities	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	NR
ETSA Utilities Finance P/L	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
Powercor Australia LLC	A-	A-	A-	A-	A-	A-	BBB+	BBB+	NR	NR	NR	NR
SP AusNet Services	A	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	NR
AusNet Services	NR	NR	NR	NR	NR	NR	A-	A-	A-	A-	A-	A-
AusNet Service Holdings P/L	A	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
AusNet Transmission Group P/L	A	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-	A-
SGSP (Australia)	NR	A-	A-	A-	A-	A-	BBB+	BBB+	BBB+	A-	A-	A-

Assets Pty Ltd												
The CitiPower Trust	A-	A-	A-	A-	A-	A-	BBB+	BBB+	NR	NR	NR	NR
United Energy Distribution P/L	BBB	BBB	BBB	BBB	BBB	BBB	BBB	BBB	BBB	BBB	A-	A-
Victoria Power Networks Pt/L	NR	NR	NR	NR	NR	NR	NR	NR	BBB+	BBB+	BBB+	BBB+
Victoria Power Networks (Finance) P/L	NR	NR	NR	NR	NR	NR	NR	NR	BBB+	A-	A-	A-
NSW Electricity Networks Finance P/ L	NR	NR	NR	NR	NR	NR	NR	NR	NR	BBB	BBB	BBB
Ausgrid Finance P/ L	NR	NR	NR	NR	NR	NR	NR	NR	NR	BBB+	BBB+	BBB
Network Finance Company P/L	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	BBB+	BBB+
Industry median (yearly)	**BBB+/ A-**	**A-**	**BBB+**	**BBB+**	**BBB**	**BBB**	**BBB+**	**BBB+**	**BBB+**	**BBB+**	**BBB+**	**BBB+**

Source: Bloomberg (S&P Global, Moodys), AER analysis

Notes:
1. The 2018 data is as at 20 June 2018, while all other years are as at 31 December.
2. ATCO Gas Australia, DBNGP Trust and DBNGP Finance are not under AER regulation.
3. The above ratings for NSW Electricity Networks Finance and Network Finance Co are S&P Global equivalent of Moodys ratings as these corporates are rated by Moodys only (Baa2 and Baa1 respectively).
4. APT Pipelines is rated Baa2 (LT issuer), DBNGP Finance is rated Baa3 (senior secured) and Ausgrid Finance is rated Baa1 (senior secured) by Moodys - however they are all rated BBB by S&P Global.
5. For some of the service providers there is now more than one related entity listed in the table above, which may affect the calculation of the median. However overall and after considering this factor, we still consider BBB+ to be the appropriate benchmark.

In our view, this indicates that those service providers have collectively maintained stable credit ratings over an extended period, which includes the GFC. All debt issuers within the sample have maintained investment grade credit ratings (between BBB– and A–) over the period. Whilst Table 42 does show that the median credit rating has moved between BBB and A-, the six most recent years of data support a rating of BBB+. We consider that this recent concentration of ratings at BBB+ provides sufficient evidence that this is the appropriate benchmark credit rating. While some submissions

argued that a BBB+ credit rating would be conservative, most supported its adoption.[1382]

Other stakeholders did not agree with this view. The Major Energy Users submitted that[1383]:

> the observed data reflects the reality of the BEE and its low risk profile as the revealed data includes for more than the BEE activities. The MEU considers that rather than taking an average of the revealed data, the AER should recognise that the revealed data is conservative and needs to be adjusted to a higher level of credit rating. In this regard, the MEU considers that the credit rating for the BEE should be A or A-, similar to that shown for ETSA and Ausnet which probably more closely reflect the BEE than other firms in the AER listing.

We do not agree that the A or A- rating would be appropriately reflective of the industry's credit risk profile because:

- Direct analysis of the credit ratings faced by energy networks indicates a median credit rating of BBB+. In our view, this is the best and most direct source of evidence on the benchmark credit rating.
- In our view there is no clear basis on which to conclude that ETSA and AusNet more clearly reflect the risks in providing regulated services than other networks in the sample.

However, as we discuss in detail in section 10.5, we have recognised that the current use of broad-BBB credit rating band in implementing the benchmark credit rating may not be appropriately reflecting the actual cost of debt and we are proposing a change to use a combined weighted average of broad-BBB and broad-A curves.

10.2 The role of the Chairmont report

We engaged Chairmont Group (Chairmont) to assist us in obtaining and analysing actual debt data from a total of 11 privately owned service providers, for comparison to the broader corporate debt market. We requested all debt instruments and financial hedging instruments issued between 1 January 2013 and 31 December 2017 as well as the issuer's debt portfolio outstanding as at 1 January 2013. Chairmont developed this data into an energy infrastructure credit spread index (EICSI) and provided us with:[1384]

- A report setting out its methodology, reasons for that methodology and high level conclusions.
- The data included in the EICSI series on which we could undertake further analysis.

[1382] See appendix A for a detailed summary of submissions.

[1383] Major Energy Users, Estimating the allowed return on debt discussion paper, p7

[1384] Chairmont Consulting, *Aggregation of return on debt data report*, 28 April 2018

In engaging Chairmont, we requested assistance in aggregating actual debt issuance information in order to undertake a sense check of our approach compared to actual practices in the industry. Having considered Chairmont's report, some stakeholders recommended that this series should have a direct role in estimation of the return on debt. For example, the Consumer Reference Group submitted that:[1385]

> The Chairmont report has generated an Energy Infrastructure Credit Spread Index (EICSI) which from Graph 1 of the report ranges from a spread of just over 120 basis points to 160 basis points. This is compared to the current AER Index in Graph 2, with the AER index ranging from about 170 to 270 basis points.
>
> …
>
> This provides the possibility of an alternative approach which is to set the return on debt by using the EICSI result directly – to allow some space for over-performance a rate of return that allowed a spread of 160 basis points on the Bank Bill Swap Rate is the most accurate estimate of the efficient debt financing cost of a benchmark efficient entity.

At this time, we do not intend to rely directly on the EICSI or similar historical index directly to estimate the return on debt. We hold this view because:

- We consider the analysis is best used as a 'sense check' on our benchmark characteristics and how we implement them.
- In our view, the use of third party data series remains appropriate and a relatively transparent and testable way to estimate the return on debt. By checking our approach against the actual data, our view is that we can refine our selection of third party data sources over time to better reflect observed practices while retaining the benefits of using third party data series.
- Chairmont has adopted general principles for inclusion and exclusion of specific debt instruments within its sample (EICSI). Our view is that these principles are reasonable and result a fit-for-purpose series for a 'sense check'. Nonetheless, we recognise that:
    - Networks have, in submissions and in further discussions about their specific responses, raised a number of methodological concerns about the analysis in the Chairmont report and, in some limited cases, made recommendations about specific debt instruments that should be included in or excluded from the sample.
    - We address these in sections 10.3, 10.5 and appendix B. At this stage, we are not persuaded that it is necessary to change the selection of debt instruments within the EICSI sample. However, we do agree that some of these concerns require further consideration and analysis. As such, we are not currently of the view that the EICSI should be used determinatively.

[1385] Consumer reference group, Estimating the allowed return on debt—Response to discussion paper, May 2018, p 4

Nonetheless, we are of the view that the evidence suggests that spreads on issued debt appears to have been less volatile than our current approach. We intend to continue collecting data in line with this request so that in future guideline reviews we can evaluate whether this is a consistent outcome over time.

10.3 Benchmark term

We need to specify the benchmark debt term for a debt portfolio in order to estimate the allowed return on debt for a service provider. The benchmark term:

- establishes the period over which the trailing average is calculated
- determines the period of the transition to the trailing average
- is an input to obtaining yields to estimate the return on debt.

Our decision is to maintain the current benchmark debt term of 10 years. In our issues paper we proposed that we would not conduct an extensive review of our approach to setting the benchmark term but instead update the empirical elements of our current consideration of the benchmark term.

Most service providers and investors submitted that we should continue to rely on the 10-year benchmark term.

In response to discussion paper, networks and investors raised a series of reasons in support of maintaining the 10-year term, including:

- that the 10-year transition to the trailing average return on debt implies a level of regulatory commitment to the approach over a number of regulatory periods
- that there remains a conceptual basis to expect networks to issue longer term debt to match the lives of their assets
- a series of contextual factors such as implementation of the transition and the privatisation of networks within the sample suggesting that the past 5-year sample may not reflect 'business as usual' with respect to the term of debt issuance
- methodological concerns with the use of a simple average of term on issued debt over 2013–17 as an indicator on which to base conclusions about the appropriate term of debt.

Consumers and retailers submitted a range of different views:

- CCP16 and the CRG pointed to evidence of shorter term issuance over the past 5 years but did not recommend a departure from a 10-year benchmark due to the uncertainty and complexity of changing the term while utilities are in the process of responding to the transition to a trailing average approach[1386].

[1386] Consumer Challenge Panel 16, Submission to the AER on its allowed rate of return on debt discussion paper, 30 May 2018, p25-26 ; Consumer reference group, Estimating the allowed return on debt—Response to discussion paper, May 2018, p3

- The MEU submitted that even a 7.5 year benchmark term to maturity may overstate the required return on debt[1387].
- The CRG and MEU recommended alternative approaches return on debt should be based on the average observed spreads of debt in our sample. This would not require an estimate of the benchmark term[1388].
- Energy Australia recommended the reduction of the benchmark term of debt to 7.5 years[1389].

Having regard to these submissions and the evidence available to us, we consider the benchmark 10-year term remains appropriate.

Our key reasons for this view are that:

- Conceptually, we expect service providers would seek to issue long term debt where possible to match the lives of their assets. In our view, this continues to support use of a 10-year benchmark term.
- Consideration of service providers' actual debt raising practices and relevant market circumstances over 2013–17 does not reveal clear conclusions.
- Over the period for which we have collected actual debt data (2013-17) we have implemented a transition to the trailing average return on debt approach. This was a material change to the return on debt approach, and we expect it would have impacted debt raising practices to some extent. Based on the data available to us, it is unclear whether or not the observed debt issuance patterns are a transient adjustment in response to our transition to a trailing average approach.
- A simple average estimate of terms at issuance (over 2013-17) within the sample of collected actual debt data suggests an average term of 7.4 years. However, we agree with the view expressed by service providers in their submissions[1390] that a simple average across instruments in the sample may understate the 'true' observed term of debt over 2013–17 where particular short term debt facilities have been refinanced numerous times over the period without growing in value.

As we detail below, we have conducted further analysis to ascertain whether the benchmark debt term of 10-years was still appropriate for estimation of allowed return on debt. We are satisfied that a 10-year term remains consistent with the evidence.

[1387] Major Energy Users, Submission on Estimating the allowed return on debt discussion paper, 28 May 2018, p5

[1388] Consumer reference group, Estimating the allowed return on debt—Response to discussion paper, May 2018, p4; Major Energy Users, Submission on Estimating the allowed return on debt discussion paper, 28 May 2018, p5-6

[1389] Energy Australia, Submission to AER review of rate of return guideline Return on Debt, 21 June 2018, p1-2

[1390] See section 10.9 for a detailed summary of submissions.

This view was supported by the majority of stakeholders through their submissions to our discussion paper on estimating the return on debt allowance.[1391] In this section, we set out further analysis on:

- Conceptual expectations for the benchmark term of debt
- Implications of the EICSI for the benchmark term
- Contextual factors affecting the 2013–17 sample, including:
    - The impact of transition to a trailing average return on debt
    - Differences in term profiles between networks
- Interaction with the form of the trailing average.

Conceptual expectations

We consider that a business will, within the constraints of the market for corporate bonds, aim to match the length of the debt term to the asset life in order to minimise refinancing risk. However, we consider this is subject to consideration of the term premium of longer term issuance.

We maintain our view from the 2013 Guidelines in which we concluded that:[1392]

> A significant proportion of regulated energy assets are long-lived. We observe that electricity transmission lines and gas pipelines are depreciated for regulatory purposes over as long as 60 years.[1393] Accordingly, we consider that the entity will seek to fund the long-lived energy assets with longer debt tenors in order to manage refinancing and interest rate risk. By issuing longer term debt the entity reduces the frequency with which it must approach the market, thereby reducing the risk associated with not being able to secure funding at the time when it is required, or at rates that are higher or lower than those it currently pays. In approaching the market less frequently there is less risk associated with changing interest rates, which reduces the volatility in debt servicing costs and the likelihood of mismatch between the business' cash flows and its debt servicing obligations.

[1391] AusNet, Response to the AER's discussion paper on estimating the allowed return on debt, 30 May 2018, p1-3; APA, Submission responding to return on debt discussion paper, p11; APGA, Submission to the AER discussion paper estimating the allowed return on debt, p8-10; Network Shareholder Group, Submission to the AER's discussion paper on estimating the allowed return on debt, 31 May 2018, p1, 4; Energy Networks Australia, Response to AER discussion paper estimating the allowed return on debt, p1, 7-13; SA Power Networks, Australian Gas Infrastructure Group, Citipower, United Energy & Powercor (the Businesses), AER discussion paper - estimating the allowed return on debt, p1-3; Consumer Challenge Panel 16, Submission to the AER on its allowed rate of return on debt discussion paper, p24-26; Queensland Treasury Corporation, Estimating the allowed return on debt discussion paper submission to the Australian Energy Regulator, May 2018, p1-3

[1392] AER, *Final rate of return guideline—Explanatory statements*, December 2013, P. 136.

[1393] As indicated by PTRM models from the following determinations: AER, *Final decision: Envestra access arrangement Vic, Part 2: Attachments*, March 2013; AER, *Final decision: Aurora distribution determination*, April 2012; AER, *Final decision: SPI Networks (Gas) access arrangement*, March 2013

> However, longer-term debt costs more than shorter-term debt in normally functioning markets, as debt holders require compensation for the risks associated with committing capital over a longer period of time. This will lead the entity to trade-off the increase in refinancing risk and the increase in transactions costs due to more frequent issuance associated with shorter-term debt against the increased cost of longer-term debt. The AOFM stated, 'a debt portfolio that reprices less frequently gives rise to less volatile debt servicing cost outcomes… Experience suggests that this risk reduction usually comes at appreciable cost.'

The outcome of this trade-off between refinancing risk and cost may vary over time. For this reason, we consider that the benchmark term of debt is also an empirical question. In the remainder of this section, we have considered evidence from actual debt raising by service providers over 2013–17.

Implications of the EICSI for benchmark term

With respect to benchmark term, Chairmont indicated that the average debt term across all instruments within the EICSI sample was 7.4 years.

In our discussion paper, we recognised that a simple average approach to averaging the term at issuance of instruments within the sample has potential limitations. Chairmont identified a series of possible factors by which this average could be weighted, including:[1394]

- Size
- Term
- Credit rating
- Pricing date clustering.

In doing so, Chairmont identified that:[1395]

> There are a range of adjustment methods that may be used to create an adjusted EICSI. Some of these are outlined below, however a weighted index would introduce significant model risk. There is no uncontroversial method to weight reported spreads for factors which influence the relative spread level. The danger is that any adjustment method could reduce the clarity and informational benefit of collecting and aggregating actual industry spread data. This is an area which AER and the industry may wish to further explore.

Chairmont's comments relate specifically to the aggregation of spread information. We have discussed in greater detail our analysis of spreads on issued debt in section 10.5. However, we consider the same is true with respect to developing a measure of the terms of debt at issuance over the 2013–17 sample period. Specifically, with respect to

[1394] Chairmont, Aggregation of return on debt data, April 2018, pp. 12–13

[1395] Chairmont, Aggregation of return on debt data, April 2018, p. 12

estimation of an appropriate benchmark term of debt, we consider that alternative weighting systems for an average term at issuance might address potential shortcomings of a simple average.

In our discussion paper, to test the sensitivity of the simple average to size of debt issuance, we also presented an average of term issued weighted by the size (face-value at issuance) of the debt issued as a proportion of the total face-value of debt in the sample. We found that there was no significant difference between unweighted and weighted average debt term of the sample with the weighted term being 7.5 years compared to 7.4 years for unweighted.

Similarly, the ENA and other network stakeholders submitted that the use of a simple average would over-represent short-term debt. For example, the ENA submitted that:[1396]

> [C]onsider a firm that behaves exactly in accordance with the AER's assessment of the benchmark efficient approach to debt financing. That firm will have a staggered-maturity portfolio of 10-year debt, of which 10% will be refinanced each year. It may also have one or more tranches of short-term debt for liquidity and/or working capital purposes – assume for this example that such debt is rolled over every 3 months. In this case, in any 12-month period, there will be:
>
> - four observations of the short-term debt being refinanced;
> - one observation of a 10-year bond being refinanced; and
> - zero weight given to the nine 10-year bonds that were not refinanced during the period.
>
> Thus, the short-term debt will be materially over-represented and the majority of the long-term debt will be omitted from the calculation entirely.

We agree that this is a potential limitation in relying on a simple average 'term at issuance' measure over a five-year period. Of the ENA's recommended alternative measures, we consider that calculation of a sector-wide portfolio over the five-year sample may avoid this potential limitation. This would require us to undertake a similar process to Chairmont in determining debt instruments in the portfolio at the commencement of 1 Jan 2013 should be included and excluded from the sample. This is a complex process requiring some amount of expert judgement and we have not been able to undertake this analysis in time for this draft guideline. Also, because the starting portfolio at the time of the 2013–17 sample would reflect debt issuance practices under the 'on-the-day' debt regime, we would still need to draw conclusions about the extent to which this was indicative of normal debt raising practices under the trailing average regime.

[1396] Energy Networks Association, *Estimating the allowed return on debt—Response to the AER discussion paper*, 31 May 2018, p11

For these reasons, we consider establishment of a portfolio return on debt is likely to be a useful exercise in future guideline reviews. We intend to continue collecting this data to develop a long-term time series to aid in this analysis.

Interaction with the form of the trailing average

In arriving at the proposed retention of the current benchmark term of 10 years, we have taken into consideration that the trailing average approach and the transition from an 'on-the-day' debt approach to the trailing average depend on the benchmark term. Under this approach[1397]:

- We have initially adopted a 10-year transition path in which:
    - The first year is estimated as over a single averaging period with a 10 year term.
    - In subsequent years of the 10-year transition period, the portfolio estimate is updated to include 10 per cent of a further tranche of 10-year debt. The weighting of the first year estimate (initially weighted at 100 per cent) is reduced by 10 per cent per year each year.
- Once the 10-year transition is complete, the return on debt in any year will reflect annual estimates over the current year and preceding 9 years, weighted at 10 per cent per year.
- If we were to adopt a different benchmark term or change it during the transition period, it would be necessary to undertake a further transition between approaches or make adjustments to the trailing average calculation methods in order to achieve the NPV=0 principle which underpins the building block revenue framework. The implementation of this change would require a further complex transition from midway through the ongoing transition based on the 10-year term.

On this issue, CCP16 submitted that:[1398]

> Clearly, there is a strong argument that the adoption of a benchmark term of 10 years contributes to a conservative (i.e. overestimate) ROD. The question of what to do about this is more complex and difficult. The primary difficulty is the uncertainty and complexity of changing the term while most utilities are in the process of adjusting their debt portfolios as part of transitioning to the trailing average of 10-years. Given the extensive analysis and debate (and administrative and judicial reviews) we would not propose that the AER change its current approach to better approximate a benchmark term based on the actual behaviour of the NSPs as part of the new Guideline – although we would not rule it out as a suitable approach beyond the transition period.

Similarly, we stated the following at the time of our previous guideline review:

[1397] AER, *Discussion paper – Estimating the allowed return on debt*, May 2018, p35

[1398] CCP sub-panel 16, Submission to the AER on its allowed rate of return on debt discussion paper, May 2018, p. 25.

> …in moving to a trailing average approach we consider that we are committing to a debt term for the period nominated. To change the benchmark debt term in response to updated debt information would not be conducive to regulatory stability. In light of this, we propose to use a 10 year debt term for estimating the return on debt and for setting the period of the trailing average. It also means that a 10-year transition will apply.[1399]

Whether the debt issuance patterns are temporary or typical

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 guideline will apply. For the reasons set out in this chapter, we consider that analysis of actual debt issuance practices is an important information source on which to base this conclusion. However, due to the timing of the relevant determinations, many of the service providers in the sample would only have had one or two years of revenue determinations under the current approach. In our view, this may be too limited a time series on which to base conclusions about longer term practices in response to the trailing average return on debt approach.

Complicating interpretation of the sample period further, many of the networks in the sample appealed aspects of our determinations to the Australian Competition Tribunal, specifically including the approach to estimate the return on debt. The process of resolving these appeals and finalising the relevant determinations has taken several years, and is yet to be finalised in some cases. It is therefore unclear when, if at all, any of the service providers affected by these determinations would adopt new debt raising strategies in response to the new approach.

In addition, the sample includes newly privatised networks for which privatisation processes took place during the period where we might expect the transition to the trailing average to be underway. Debt raising practices during the initial acquisition of an asset may not reflect 'business as usual' debt raising practices.

We also recognise that debt issuance from service providers or their parent companies are unlikely to respond only to the approach we adopt to estimating the return on debt. As identified in previous reports by Chairmont, there are a range of different strategies a service provider could adopt depending on its appetite for risk[1400].

Differences in debt term profile between service providers

In our discussion paper, we also estimated the weighted average (by face value at issuance) term at issuance for each issuer of debt to assess whether or not terms are common across the sector.

[1399] AER, *Better Regulation Explanatory Statement Rate of Return guideline*, December 2013, p137

[1400] Chairmont Consulting, *Financial practices under regulation: past and transitional,* October 2015*,* pp. 75-84

We found that some issuers had an average debt term at issuance at around 10 years including some with in excess of 10 years, while other issuers had an average debt term at issuance of at or around 5 years. After further analysis our view is that:

- The networks with average terms issued at or around 5 years appear as though they may be impacted by the tendency for a simple average of debt instruments issued over a relatively short sample to over-represent short-term debt
- We have had regard to this possibility of over-representation in reaching our view on the empirical evidence on benchmark term.

As we identified in developing the 2013 Guidelines,[1401] the choice of term at issuance reflects a trade-off between:

- Refinancing risk— this 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 because they are expensive. 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. For example, if lenders knew that a company needed to refinance its debt at a certain time or risk bankruptcy, they might raise the interest rates that they demand from the company.
- Higher overall portfolio costs—the need to manage refinancing risk is balanced against the overall cost of the benchmark efficient entity's debt portfolio. For example, a longer average term of debt for a debt portfolio means lower refinancing risk. But it also means the total cost of the debt portfolio is higher. Hence, the efficient debt financing practices would address this trade–off.

Different average terms between the service providers could be a reflection of different appetites for refinancing risk across the sector. The nature of a benchmark term allows for the possibility that different networks might adopt strategies facing more or less risk and either benefit from or face the consequences of that risk. For this reason, neither the lower nor higher-risk approach necessarily reflects the most efficient approach.

10.4 Choice of third party data provider

In our 2013 Guidelines and subsequent regulatory determinations we decided to source debt data from the RBA and Bloomberg. Since then we have become aware of two additional data sources: Thomson Reuters and S&P Global. For our 2018 Guidelines our decision is to continue to source data from RBA and Bloomberg and to also source data from Thomson Reuters. Specifically, we will rely on:

- RBA estimates from its F3 data series
- Bloomberg estimates from its BVAL series (BVSCAB and BVSCAE)

[1401] AER, Final rate of return guideline—Explanatory statement, December 2013, p 104

- Thomson Reuters estimates from its blended AUD corporate series (BBBAUDBMK and AAUDBMK).

In contrast, we will not use third party yield data from S&P Global at this point in time.

Stakeholder submissions generally supported continued reliance on the Bloomberg and RBA curves but there were mixed views on:

- Whether to include the Thomson Reuters or S&P Global curves—the CRG supported inclusion of the new curves.[1402] CCP16 supported inclusion of the Thomson Reuters curve, and subject to further testing, the adoption of the S&P Global curve contingent on availability of a reliable longer historical series.[1403] Networks, investors and QTC all submitted that we should maintain the current approach of using BVAL and RBA curves only.[1404]
- What weight to put on the curves—for example, CCP16[1405] and the CRG proposed we should give greater weight to the RBA curve compared to the other curves.

Having regard to the available evidence, we consider none of the RBA, BVAL or Thomson Reuters methodologies is clearly superior. Our view is that the combined use of the three data providers will contribute to achievement of the NEO and NGO to the greatest degree. Our key reasons for this view are:

- 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 Thomson Reuters have their unique strengths and weaknesses, but we are not satisfied that any curve is clearly superior.
- All of the curves from all three 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.
- In our view, applying equal weight to each of the three 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 average from different weighting schemes will be material over time.
- An average of the three data providers reduces the impact of shocks in any one of the individual curves. This will reduce potential volatility. Further, the use of three data providers incorporates a natural contingency in the event that one of the data providers ceases publication.

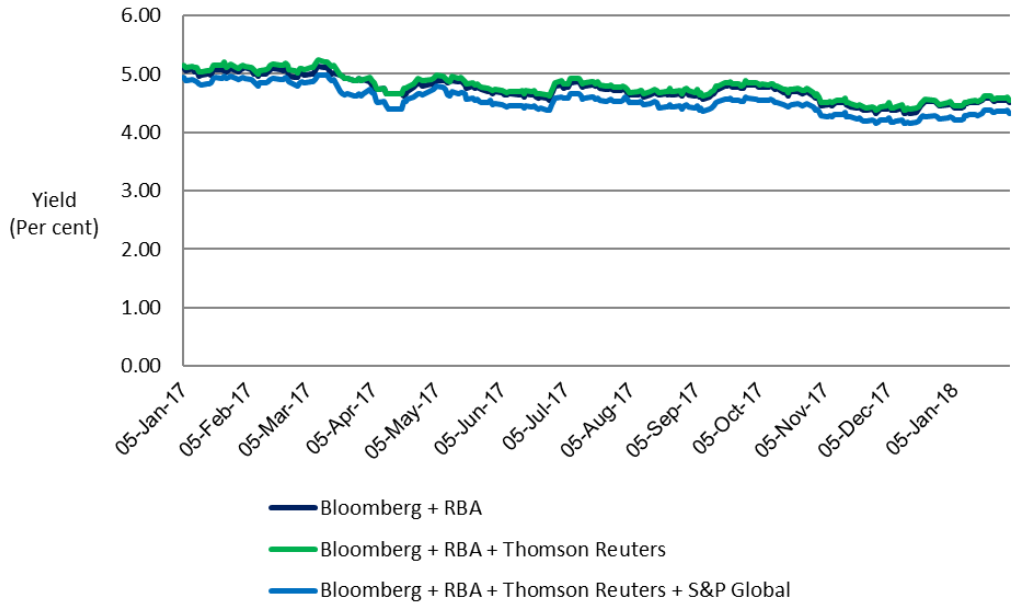
[1402] CRG, Estimating the allowed return on debt—Response to discussion paper, May 2018, pp. 2–3

[1403] CCP16, Submission to the AER on its allowed rate of return on debt discussion paper, May 2018, p. 21.

[1404] See section 10.9 for a detailed summary of submissions.

[1405] CCP16, Submission to the AER on its allowed rate of return on debt discussion paper, May 2018, p. 21; CRG, Estimating the allowed return on debt—Response to discussion paper, May 2018, pp. 2–3

Figure 29 Impact of including the Thomson Reuters and S&P Global curves



Source: Bloomberg, RBA, Thomson Reuters, S&P Global, AER analysis.

Our detailed analysis of the four curve providers is set out in full in our discussion paper. In the remainder of this section, we discuss:

- reasons for our decision to rely on Thomson Reuters curves
- reasons why we will not rely on the S&P Global curves at this time
- weighting of the data providers
- the RBA's recent updates to its historical data series.

Reasons for our decision to rely on the Thomson Reuters curve

Based on evaluation of available information on the curve methodologies, we hold the view that all four curves have strengths and weaknesses and none is clearly superior with respect to either the bond selection criteria or curve fitting methodology. Overall, there is a substantial overlap between the curves in terms of bond selection criteria, though each curve has distinctive characteristics. In our view none of the differences are clearly ‘right’ or ‘wrong’.

Based on the factors set out in our analysis in the decision paper, we are satisfied that the Thomson Reuters data series are fit for purpose.

The analysis of technical characteristics in the RBA, Bloomberg and Thomson Reuters debt series have been addressed in prior reports by the ACCC's Regulatory Economics Unit and by Dr Lally.[1406]. A comparison of the bond selection criteria and curve fitting methodologies of the four data providers is set out in our May 2018 return on debt discussion paper.

In contrast, the ENA submitted that the Thomson Reuters curve performs poorly against four criteria it sets out in its submission.[1407] We do not agree that either the BVAL or RBA curves are superior to the Thomson Reuters curve in overall fitness for purpose. We set out our views on the ENA's submissions in the table, below.

[1406] ACCC Regulatory Economics Unit, Thomson Reuters Credit Curve Methodology – Note for the AER, April 2017, Lally, Implementation issues for the cost of debt, November 2014; ACCC, Regulatory Economic Unit, Return on debt estimation: a review of the alternative third party data series – Report for the AER, August 2014.

[1407] Energy Networks Australia, Estimating the allowed return on debt, Response to AER Discussion Paper, May 2018, p. 15.

Table 43 AER responses to ENA submissions on the Thomson Reuters curve

ENA submission	AER comments
The main 'blended' Thomson Reuters curve places no restrictions on the ownership or country of risk	We agree that our data series would ideally include only debt issuers with Australia as a country of risk. However, all curves include material departures from our benchmark companies. For example, all of the possible curves include bonds which are not Australian regulated utilities. In our view, there is no clear basis to conclude that differences in sovereign risk characteristics will be more material than those departures from the benchmark. As such, we consider the benefits of the broader data series outweigh the costs of this difference compared to our service providers.
As the Discussion Paper notes, the Thomson Reuters curve is intermittent in its availability. If this intermittency is due to the underlying curve-fitting methodology used by Reuters, as suggested in the Issues Paper, then the availability of the Thomson Reuters curve may continue to be sporadic over time.	As noted in the discussion paper, Thomson Reuters does not extrapolate its curve beyond the longest term bond in its sample. However: • Thomson Reuters has published a 10 year estimate on approximately 75 per cent of business days since April 2015 • Even where it does not publish 10 year estimates, Thomson Reuters has published 8 and 9 year estimates on 97 per cent of business days. This is consistent with normal practice for the RBA curve, which typically publishes its 10 year estimate with an 'effective term' of 8–9 years.[1408]
The adoption of up to four different yield curves in order to determine the return on debt allowance would be overly cumbersome, complex and burdensome on stakeholders with no obvious offsetting benefit. ENA supports the relatively simple approach of using two reliable data sources—RBA and Bloomberg—which appears to have been working effectively for a number of years.	We recognise the additional costs and administrative costs from the inclusion of additional curves in our sample. However, in our view, the benefits of a greater mix of curve providers outweigh those incremental costs. In particular: • The Thomson Reuters curve requires fewer adjustments for use than (for example) the RBA curve. In our view, the incremental administrative burden of adding this curve provider to our methodology is low. • Additional curves provide a greater level of mitigation against idiosyncratic outcomes from a particular curve or the temporary or ongoing cessation of publication of a curve.

Source: Energy Networks Australia, Estimating the allowed return on debt, Response to AER Discussion Paper, May 2018, pp. 15-17; AER analysis.

Reasons for our decision not to rely on the S&P Global curves at this time

In general, our view is that consideration of data providers' methodologies is the most important criteria on which to base our decision on the choice of data series. However,

[1408] The average 'effective tenor' over the full series is 8.79 years.

in this case, the S&P Global's Australian-dollar-denominated curves produce outcomes which are materially different to the other curve providers and to our expectations: [1409]

- Over the data series we have available, the S&P Global broad-A and broad-BBB curves produce very similar results where we would expect a more material difference. In contrast, the BVAL, RBA and Thomson Reuters curves as well as S&P Global's US-dollar-denominated curves exhibit a more material difference.
- For the majority of the period since December 2013, the S&P Global Australian-dollar-denominated broad-BBB yield curve produce yields estimates below the 'A' rated curves from the other curve providers.

We recognise that there may be valid drivers of the differences between curve estimates. However, disaggregation of the drivers of these differences is complex due to the proprietary nature of curve estimation and we have not been able to reconcile the differences at this time.

Weightings for the data providers

We are satisfied that a simple average of the three curves will result in a return on debt that is fit for purpose. This is because:

- On the bond selection criteria (including approach for identifying outliers) and curve fitting (or averaging) methodologies, we consider that the approaches employed by RBA, Bloomberg and Thomson Reuters have their unique strengths and weaknesses, but we are not satisfied that any curve is clearly superior.
- All three curves require adjustments from their published form to make them fit-for purpose, and we are not satisfied that either can be more simply or reliably adjusted to estimate the return on debt than the other. We also note that selecting curves based on their required adjustments may come at a cost of the contingency value in using multiple curves.
- The three curves have regularly produced materially different results at particular points in time. The curves have their strengths and shortcomings, but it is not clear to us that one approach is clearly superior.
- A simple average of the three curves will reduce the likely price shock if either curve becomes unavailable or produces erroneous estimates during the period.
- The published curves are widely used and market respected.
- Queensland Transport Corporation (QTC) submitted that the current approach of using equally weighted curves such as RBA and Bloomberg is appropriate. The Australian Pipeline and Gas Association (APGA) submitted that we should consider the pros and cons of each curve when deciding on weightings.

[1409] To assist in our analysis, S&P Global has kindly provided us with a longer historical time series of monthly data than is currently publicly available. We have had regard to this analysis in reaching our decision.

Currently the RBA and BVAL curves are weighted equally. The weighting is based on findings from Lally. In particular, Lally derived formulae to demonstrate that, subject to some assumptions, the mean squared error (MSE) of the two variable estimator would be reduced with equal weighting.[1410] In our previous decisions we mentioned that while we could make simplifying assumptions to include a new curve at equal weight, it is unclear if these would be reasonable without further analysis.

However, reliance on the MSE estimator in these circumstances relies on assumptions about the underlying bias of the series. That is a complex exercise which, in our view, exhibits diminishing returns on top of an already complex approach. In our view, a simple average of the curves:

- Is intuitively reasonable
- Gives equal weight to the strengths and weaknesses of the three curves, which is generally consistent with our evaluation of the curves
- Mitigates equally against price shocks in the event that any one curve temporarily or permanently ceases to be published.

The RBA's revisions to its historical data series

In its 5 June 2018 data release, the RBA made a series of historical revisions to its F3 data series.[1411] We rely on the RBA data sources in our return on debt approach. Following this update, we sought further information from the RBA about the specific nature of any changes.[1412] . We received a response from the RBA on 4 July and have published it on our website with this draft guideline.[1413] Due to the timing of its receipt, we have not yet had an opportunity to consider its substance. Based on the information currently available to us, our draft decision is to continue to rely on the RBA's estimates because:

- In its published documentation for the curve, the RBA has not flagged material changes to its methodology as set out in the original bulletin article. Our analysis of the fitness for purpose of the RBA curve reflects the methodology set out in the bulletin. To the extent that the RBA has refined its implementation of that methodology, we remain satisfied that use of the RBA series within our curve-mix will contribute to achievement of the NEO and NGO.
- The RBA has previously updated its methodology, including historical data revisions, to better capture the conversion of US Dollar bonds into Australian dollar

[1410] Lally, *Implementation issues for the cost of debt*, 20 November 2014, pp. 7–21

[1411] See RBA, Changes to statistical tables, 5 June 2018—Available at: http://rba.gov.au/statistics/tables/changes-to-tables.html

[1412] AER, Letter to the RBA—Revisions to statistical table F3, 26 June 2018.

[1413] RBA, Letter to the AER—Revisions to statistical table F3, 4 July 2018.

equivalents.[1414] Stakeholders have continued to support reliance on the RBA curve since those changes.

We also note that the revisions in the RBA curve:

- bring the estimated outcomes closer into line with the estimates from the BVAL curve
- reduces by a small margin the differences between our approach and the spreads on networks' actual debt instruments.

10.5 Implementation of the benchmark credit rating

In this section, we discuss the implementation of the broad-credit rating band we adopt for estimation. While our benchmark credit rating has been BBB+, curve providers typically offer Australian Dollar debt curves as broad-BBB (BBB-,BBB,BBB+) or broad-A (A-,A,A+). We are not aware of a curve that directly estimates AUD corporate BBB+ debt. As a result, we have to make a choice about which broad credit rating band or combination of bands best gives effect to our target credit rating, which has been BBB+.

Our draft guideline approach is to adopt a weighted average of the broad-BBB and broad-A curves offered by Bloomberg (BVAL), RBA and Thomson Reuters. Specifically, our estimates of the 10-year AUD corporate yield from each curve provider will:

- Be weighted 1/3 of the 10-year estimate derived from the broad-A curve for a provider
- Be weighted 2/3 of the 10-year estimate derived from the broad-BBB curve for a provider.

We consider that this weighted average will contribute to achievement of the NEO and NGO to the greatest extent because:

- For the reasons discussed in this chapter, we consider credit ratings are imperfect measures of debt risk. However, we consider the use of a 'broad-BBB' series alone will, other things held constant, overestimate the return on debt required for a BBB+ rated entity.
- Similarly, we consider sole reliance on a broad-A curve will overestimate the return on debt required for a BBB+ rated entity.
- Therefore, some combination of broad-BBB and broad-A curves should provide the best fit to a BBB+ benchmark rating. In our view, a 2/3 broad-BBB: 1/3 broad A rating is most likely to match a BBB+ benchmark credit rating.[1415]

[1414] See RBA, Changes to statistical tables, 5 June 2017—Available at: http://rba.gov.au/statistics/tables/changes-to-tables.html ; RBA, *Letter to the AER— Questions regarding aggregate measures of Australian corporate bond spreads and yields (statistical table F3)*, July 2017.

- Our analysis of actual debt instruments raised by service providers compared to our current approach suggests that:
    - When term and date of issuance are controlled for, the use of broad-BBB curves has, over 2013–17, overestimated by approximately 27 basis points the spreads at which service providers have issued debt
    - When term and date of issuance are controlled for, a weighted average of 2/3 broad-BBB:1/3-broad A curves has, over 2013–17, overestimated by approximately 9 basis points the spreads at which service providers have issued debt

Why we consider a broad-BBB curve is conservative

For the reasons discussed in this chapter, we consider credit ratings are imperfect measures of debt risk. However, we consider the use of a 'broad-BBB' series alone will, other things held constant, overestimate the return on debt required for a BBB+ rated entity.

In regulatory determinations made after the 2013 Guidelines, we have acknowledged that reliance on a broad-BBB curve only is likely to overestimate the yield for a BBB+ benchmark.[1416]

This is because, to the extent that credit ratings are an informative measure of credit risk, we expect:

- reliance on a broad-BBB curve is likely to overestimate the level of credit risk (and ultimately the required yields) of a BBB+ benchmark credit rating− because the benchmark credit rating (BBB+) is the highest rating band amongst the constituents, the inclusion of any of the lower rated bonds in the sample (BBB or BBB-) would, other things held constant, overestimate the required return on debt for the benchmark credit rating
- reliance on a broad-A curve only would underestimate the level of credit risk (and ultimately the required yields) for a BBB+ benchmark credit rating because all constituents (A- ,A ,A+) are higher rated than the BBB+ benchmark credit rating
- some combination of broad-BBB and broad-A curves should therefore provide the best fit to a BBB+ benchmark credit rating. As a conceptual expectation, our view is that a 2/3 broad-BBB: 1/3 broad A rating is most likely to match a BBB+ benchmark credit rating.

[1415] We explain our reasons for this view in more detail in appendix 0.

[1416] See for example: AER, *Final determination— AusNet Services transmission determination 2017-2022— Attachment 3: Rate of return*, April 2017, p. 340

Spread comparison at matched terms − evidence that the current approach (broad-BBB curve only) is conservative

The term to maturity of debt issuance appears to be a material driver of the differences between the AER approach and EICSI at points in time during the observed sample (2013-17). However, for the reasons set out in section 10.3, our draft decision is to maintain a 10-year benchmark term. Nonetheless, in our view, analysis of the EICSI sample supports a conclusion that service providers have outperformed our current approach to a material extent even once we control for issuance of debt at shorter terms than the 10-year benchmark.

To assess this, we have undertaken a comparison of credit spreads for debt instruments within the EICSI against the AER approach at a matching term on the commencement date of the debt instrument.

Specifically, we have compared the spreads on issued debt against an average credit spread estimated using the BVAL and RBA broad-BBB curves at matched-terms.[1417] For example, if a debt instrument was issued with 5 years' term of maturity on 1 Jan 2013, we have compared its credit spread against a simple average of the BVAL and RBA broad-BBB curve estimates also issued at a 5 year term on 1 January 2013.[1418] Where there is a difference between these two credit spreads, this implies a difference caused by factors other than term or the timing of debt issuance.

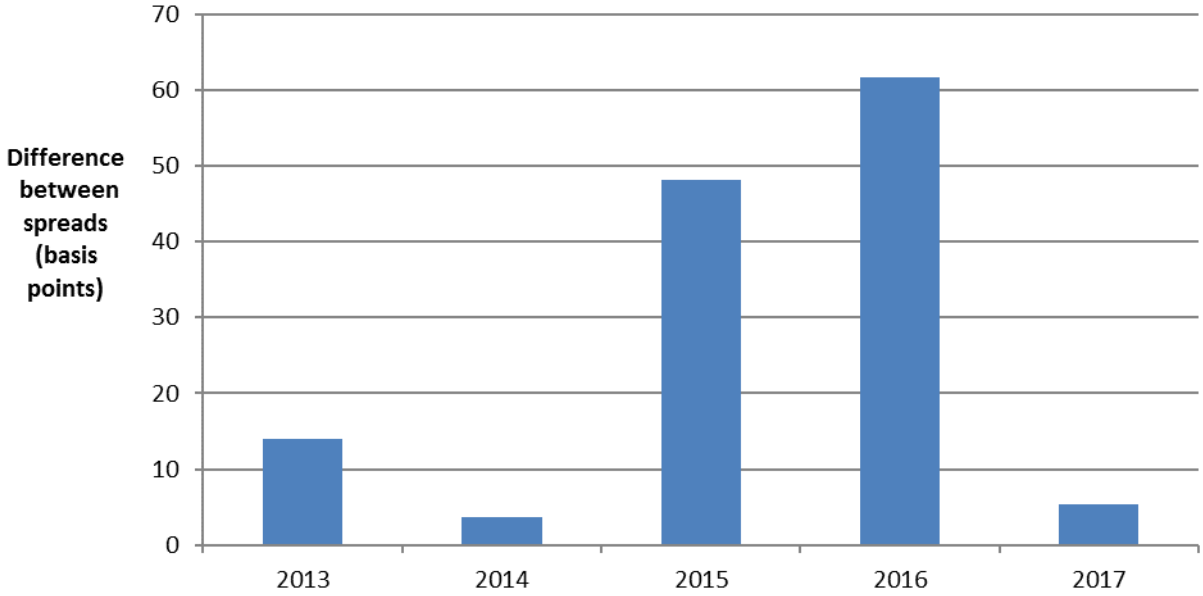
Our analysis suggests that debt within the EICSI is raised at, on average, approximately 27 basis points less than equivalent debt estimated using the an average of the BVAL and RBA broad-BBB curves.[1419] However, as set out in Figure 30, there is time-variation in these spread differences.

[1417] In some cases, there is no corresponding BVAL or RBA estimate because the term of issued debt is longer term than the longest published term at issuance by either of the curve providers. We have not calculated a 'difference estimate' in these cases because they would require strong assumptions to extrapolate the curves. This excludes approximately 10 per cent of the sample. However, we have undertaken a sensitivity check using a conservative assumption (spreads held constant from longest published term) and it does not appear to materially change the result.

[1418] We have interpolated the third party yield curves between their published terms using linear extrapolation. For the RBA curve, the shortest published term to maturity is 3 years. We have used the rate of change of the spread to swap between the 3 and 5 year terms to interpolate estimates at 1 and 2 year terms to maturity. Bloomberg typically publishes its BVAL estimates at a greater number of term points, resulting in less need for interpolation.

[1419] This has been updated since our discussion paper to reflect the RBA's revisions to its historical F3 data series.

Figure 30 Comparison of spreads on debt instruments against the Bloomberg and RBA broad-BBB estimate at matching term to maturity



Source: AER analysis, Bloomberg, RBA.

Note: The figure presents annual averages of matched-term spread differences. It has been updated since the discussion paper to incorporate the RBA's June 2018 revisions to its F3 statistical table.

This time variation appears to be driven by a range of factors. In particular, there has been more variation in the published third party yield curves than in the spreads on issued debt.[1420]

Spread comparison at matched terms− weighted average of broad-BBB and broad-A curve

In section 10.1, we discussed the service providers' benchmark credit rating.

To implement this benchmark credit rating, we would ideally select a third party yield curve based on bonds of a credit rating matching our benchmark. However, both providers that we currently rely on (Bloomberg and RBA) and the two additional providers whose curves we are now also considering (Thomson Reuters and S&P Global) publish curves based on broad credit-rating bands. This means that, rather than including only BBB+ rated bonds, the curves we have relied on to date are 'broad-BBB' curves and include BBB-, BBB and BBB+ rated debt.

We have also received expert advice in the past indicating that credit ratings are an informative but not perfect proxy for the risk of debt.[1421] This is because:

[1420] On this point, we observe that the RBA curve has been more volatile than the BVAL curve.

- credit ratings are primarily an indicator of the risk of default, whereas required returns on debt also depend on other factors including the likely loss given default[1422]
- credit ratings depend on the use of evaluative judgement by the credit rating agencies
- issues from different industries within the same credit rating band respond differently.

When considering how best to implement the benchmark credit rating, there are alternatives to the use of the broad-BBB curve alone. One possible alternative is combined use of both broad-BBB and broad-A (including A-, A and A+ rated debt). This could be in the form of either a simple or weighted average.

By comparing the outcomes of alternative approaches against actual return on debt information such as the EICSI, we may be able to better inform a view on the best broad-rating curves to implement our benchmark.

To illustrate the possible impacts of a change to our implementation of the benchmark credit rating, Figure 32 below illustrates the outcomes if we had adopted a weighted (2/3 broad-BBB, 1/3 broad-A) average of broad-BBB and broad-A curve estimates over 2013–17. This follows the same 'matched-term differences' approach underlying Figure 30. This weighting system should, on average, more closely match an average credit rating of BBB+ compared to the use of a broad-BBB curve alone.

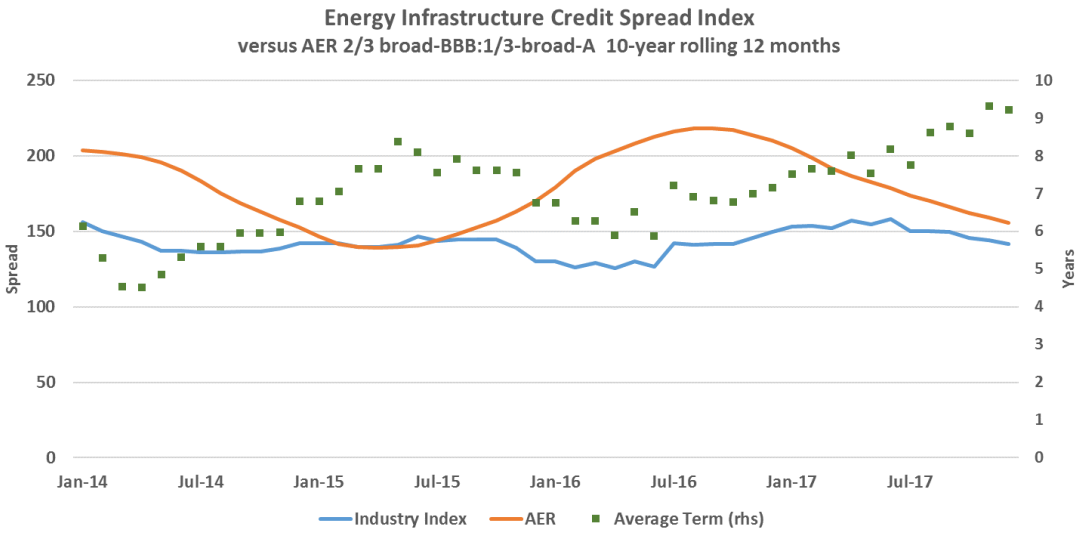
The average difference across all issuances over the five year sample, captured in Figure 32, is approximately 9 basis points. This follows the same 'matched-term differences' approach underlying Figure 30. That is, service providers issued debt at spreads to swap 9 basis point below the weighted average calculated using the AER's approach to implementing the benchmark credit rating.

Figure 31, below, shows that, by using a weighted average of broad-A and broad-BBB yield curves rather than BBB-only, the industry index and AER series converge where the average term in the industry index comes closer to 10 years. Where the average term is shorter than 10 years, there remains a difference between the industry index and AER series. However, due to the effects of the use of broad-A and broad-BBB curves, this difference is narrower than it would be using our current approach.

[1421] See for example: ACCC Regulatory Economic Unit, *Thomson Reuters Credit Curve Methodology – Note for the AER*, April 2017, p. 8-11;

[1422] ACCC, Regulatory Economic Unit, *Return on debt estimation: a review of the alternative third party data series – Report for the AER*, August 2014, p. 23

Figure 31 Impact of using a 2/3:1/3 average of broad-A and broad-BBB yield curves— after adjustment for June 2018 RBA data revisions[1423]

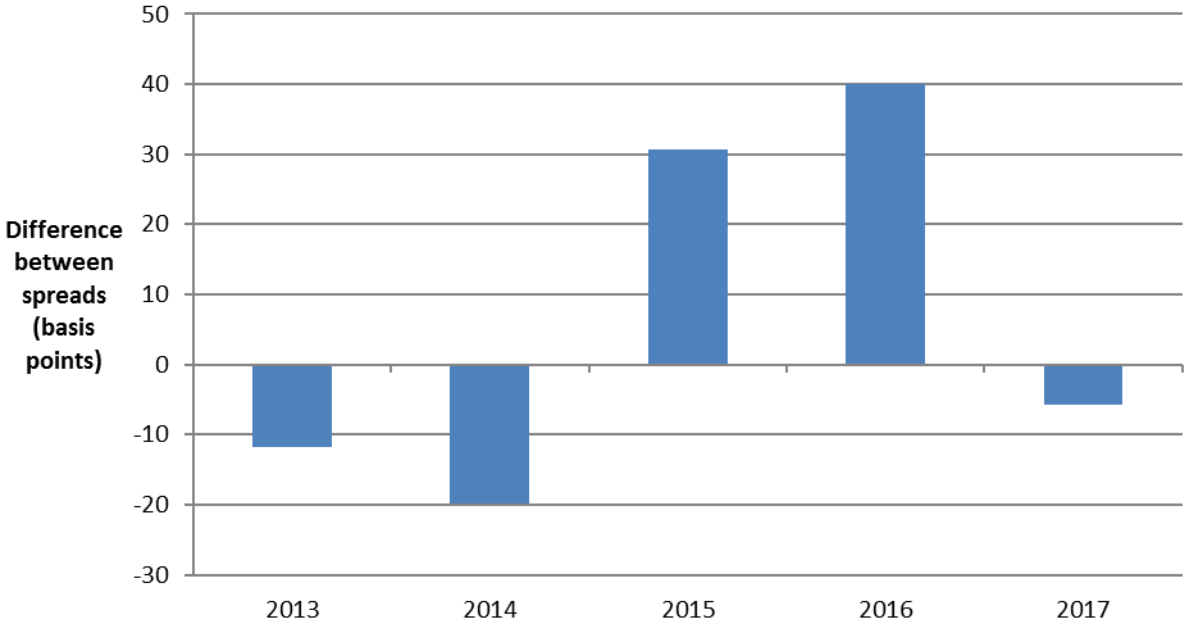


Source: AER analysis, Chairmont spreadsheet.

Figure 32, below, illustrates the differences between credit spreads at issuance once we have controlled for the effects of term. Where there is an average difference between credit spreads in Figure 32, this is likely to be driven by factors other than term. It does not imply that in 2013, for example, networks raised debt at higher spreads than the 2/3 broad-BBB: 1/3 broad-A average using a 10 year benchmark term. We note that there was a substantially higher number of individual debt issuances in 2016 and 2017. For this reason, the differences for those years in Figure 32 have been more influential in calculating an overall average difference across the five year sample.

[1423] Note: The 'spread' axis in this figure refers to the credit spread in basis points. Compared to the discussion paper, we have updated this figure to reflect the RBA's historical revisions to its F3 data series.

Figure 32 Comparison of spreads on debt instruments against the Bloomberg and RBA weighted average broad-BBB and broad-A estimate at matching term to maturity



Source: AER analysis, Bloomberg, RBA

Note: The figure presents annual averages of matched-term spread differences. It is based on a 2/3 broad-BBB 1/3 broad-A weighted average estimate. It has been updated since the discussion paper to incorporate the RBA's June 2018 revisions to its F3 statistical table.

While there is some time-variation in the sample, we are satisfied that the use of this weighted average of broad-A and broad-BBB curves would have resulted in a closer fit between the AER's approach and the actual spreads at which service providers raised debt over 2013−17. In particular:

- the average outperformance over the sample at matched terms is +9 basis points compared to +27 basis points using broad-BBB only
- average annual outperformance and under-performance appears to be roughly symmetrical—there are 2 years in the sample in which the average matched-term difference is positive and 3 years in which it is negative including one year where the negative average is below 10 basis points.

Submissions on spread comparisons at matched terms

Some stakeholders raised methodological concerns about the analysis of differences at matched terms.

In particular, the ENA submitted that these comparisons of spreads at matched terms unreasonably excluded debt at terms of greater than 10 years.[1424] Our analysis in this section is limited to instruments at 10 or fewer years because the RBA curve is never published at terms longer than 10 years. In order to compare spreads on actual debt issued against spreads using our current approach, we consider it is appropriate to limit any extrapolation beyond the longest term published by the curve providers we currently rely on.

However, we consider our sensitivity testing of instruments at or longer than 10 year terms supports our overall conclusions:

- Bloomberg has published BVAL estimates of up to 30 years since April 2015. We have tested the sensitivity of our conclusions on longer term debt by estimating the spread differences at matched terms using the BVAL curve only, which allows us to capture the majority of longer term debt in the sample.
- The average difference for debt instruments issued at terms of 10 years or longer compared against the use of broad-BBB Bloomberg data is approximately 22 basis points. That is, on bonds with terms at or greater than 10 years for which there is published BVAL data at a common or longer term, service providers have issued debt at, on average, 22 basis points below what is estimated under the BVAL curve.
- This analysis includes approximately 77 per cent of the debt instruments in the EICSI sample that have a term at issuance of ten years or longer. For the remaining 23 per cent there is neither BVAL nor RBA data published at a corresponding or longer term.

Beyond this, the ENA made a series of further submissions on general methodological issues relating to the EICSI and our analysis of it.[1425] These include submissions relating to:

- The inclusion or exclusion of callable debt
- Overweighting of short term instruments in a simple average
- Exclusion of subordinated debt
- Treatment of fees
- Exclusion of 2018 data.

These issues were outlined in further detail in a CEG memorandum provided to the AER as a late submission on 21 June 2018. We discuss our views on these issues in more detail in appendix B. Having had regard to these issues, we remain of the view that analysis of spread differences at matched terms suggests that:

[1424] ENA, *Estimating the allowed return on debt—Response to the AER discussion paper*, May 2018, p. 22.

[1425] ENA, *Estimating the allowed return on debt—Response to the AER discussion paper*, May 2018, pp. 18–23.

- When term and date of issuance are controlled for, the use of broad-BBB curves has, over 2013–17, overestimated by approximately 27 basis points the spreads at which service providers have issued debt
- When term and date of issuance are controlled for, a weighted average of 2/3 broad-BBB:1/3-broad A curves has, over 2013–17, overestimated by approximately 9 basis points the spreads at which service providers have issued debt.

10.6 Adjustments to published data

We rely on published third party yield curves in order to implement our return on debt approach. However, in some cases these published third party yield curves require minor adjustments to meet the requirements for our estimation process. Table 44, below, 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. Our draft decision on extrapolation, interpolation, and conversion is to adopt a common approach to the published curves.

Extrapolation

Where the published curve has a maximum published effective term of less than the target term to maturity,[1426] 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 CGS component of the published yield to 10 years using the two longest published estimates and will add this to a 10 year CGS
- If a curve ceases publishing a curve with a longest published term of greater than or equal to 7 years, we will not rely on that curve.

In the past, we have received advice from Lally indicating that linear extrapolation is reasonable where the extrapolation term range is relatively small.[1427] In decisions made since our 2013 Guidelines and having regard to this advice from Lally, we extrapolated the published 5 or 7 year BVAL estimate to 10 years using the corresponding margin in the RBA curve.

However, we propose now to adopt a consistent approach across all three curve providers. Specifically, we will rely consistently on linear extrapolation where a curve provider publishes a curve with a longest term between 7 and 10 years. We reach this view because:

[1426] We distinguish a published 'effective' term because the RBA, while publishing a 10 year yield estimate, identifies in the F3 table that the 'effective term' can differ from 10 years. We understand that, for example, a published 10-year RBA yield estimate is made up of a 10 year base rate and an approximately 10 year credit swap component. To correct for this, we extrapolate the credit spread component so that the effective term of the estimate is 10 years.

[1427] Lally, *Implementation issues for the cost of debt*, November 2014, pp. 38–−44.

- In our view, all three curve providers have strengths and weaknesses. Further, there is no reason we are aware of to expect that any single curve provider is more likely than the other providers to continue publishing its yield curve estimates to 10 years. In principle, our view is therefore that our extrapolation approach for any one curve should not rely on the continued publication of another curve.
- We have designed our approach in the context of a binding methodology to be applied to determinations over a four year period to which we expect a binding rate of return instrument would apply. For this reason, we consider it is preferable to adopt an extrapolation approach which does not depend on the continued publication of other curves.
- Since 2015, all three curve providers have generally published yield curves at both broad A and broad BBB credit rating bands of at least 7 years. As such, recent evidence suggests that the need to extrapolate from a 7 year estimate may be infrequent. The addition of a further curve provider to our curve mix should diminish the materiality of the extrapolation approach applied to any one curve.
- The RBA curve publishes its 10 year estimates with an effective term that has consistently been less than 10 years and commonly less than 9.[1428] We have relied on linear extrapolation to convert this into a yield estimate with an effective term of 10 years. Similarly, the Thomson Reuters broad-A and broad-BBB curves are most commonly published to a 10 year term, but where they are not they are almost always published to 9 or 8 year maximum terms.[1429] As such, for consistency with our approach used to extrapolate the RBA curve we would otherwise rely on linear extrapolation from 8 or 9 years for the Thomson Reuters curve. In light of the practical benefits of a consistent and simple extrapolation approach across all three curve providers, we consider the extension of linear extrapolation back to 7 years to be an incremental change.

Interpolation

Where we need a value for which there is no published estimate but it lies between two 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.[1430] This requires assumptions about the linearity of spread movements over the course of the

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[1428] See RBA, F3—Aggregate measures of Australian corporate bond spreads and yields, Available at: http://rba.gov.au/statistics/tables/#interest-rates

[1429] See Table 43 in section 10.4.

[1430] 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.

month. We have discussed the potential effects of these assumptions in previous decisions.[1431]

Conversion to an effective annual rate

The effective annual rate is calculated by taking the nominal rate and 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 44 Necessary adjustments to published yield curves

Curve	Necessary adjustments
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 and small 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. Also, as a consequence 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 and 10 year estimates. In addition, RBA estimates require conversion to an effective annual rate.
Thomson Reuters	Thomson Reuters typically publishes a daily 10 year estimate so the only necessary adjustment is conversion to an effective annual rate. However, Thomson Reuters does not extrapolate beyond the longest term in its bond sample and the availability of its 10 year estimate may vary.
S&P Global	Over the period its curve has been offered (since January 2017), S&P Global typically published a daily 10 year estimate so the only necessary adjustment is conversion to an effective annual rate.

Source: AER analysis, Bloomberg, RBA, Thomson Reuters, S&P Global.

10.7 Averaging periods

In our view, our current approach for determining averaging periods remains mostly appropriate for the purposes of implementing the return on debt approach. However, we consider some incremental changes are necessary to allow for the nomination and acceptance of averaging periods to occur without the exercise of any discretion. Table 45, below, sets out a set of requirements for return on debt averaging periods which are contained in clause 18 of the draft rate of return guidelines. We are satisfied the

[1431] See for example: AER, *Final determination— AusNet Services transmission determination 2017-2022— Attachment 3: Rate of return*, April 2017, pp. 204–209.

provisions in clause 18 for return on debt averaging periods will contribute to achievement of the legislative objectives. We have introduced two new criteria beyond those specified in our current approach. As set out in clause 18, the averaging periods nominated by a service provider will be kept confidential, to continue the practice in our current approach.

Table 45 Return on debt averaging period criteria - Clause 18 of draft rate of return guideline

Clause no.	Criteria	Previous criteria	Comments
Cl 18(a)	An averaging period for a regulatory year must finish no earlier than 12 months prior to the commencement of a regulatory year.	n/a	This criterion, in combination with the other criterion below, establishes unambiguous limit on the period in which an averaging period can occur. By allowing for a 12 month window prior to the averaging period, this should: • avoid service providers being forced to raise debt in some months during which some participants choose to stay out of the market • allow service providers which raise debt as part of a corporate group to select averaging periods which overlap
Cl 18(b)	An averaging period for a regulatory year must finish no later than 3 months prior to the commencement of a regulatory year.	n/a	This criterion, in combination with the other criterion below, establishes unambiguous limit on the period in which an averaging period can occur. In particular, the 3 months minimum between end of an averaging period and commencement of a regulatory year is necessary for the calculation of annual updates to apply during annual pricing processes.
Cl 18(c)	An averaging period for a regulatory year must be observed over a period of 10 or more consecutive business days up to a maximum of 12 months.	Observed over a period of 10 or more consecutive business days up to a maximum of 12 months	Averaging daily estimates over a number of days smooths out short term volatility in the annually updated return on debt allowance.
Cl 18(d)	An averaging period for a regulatory year must be specified prior to the commencement of the regulatory control period.	It should be specified prior to the commencement of the regulatory control period.	This allows us to substantively assess the service provider's proposal. This avoids the practical difficulties with either (1) creating a new process for approving averaging period proposals or (2) assessing averaging period proposals during the annual pricing process, which is meant to be a compliance check that takes place over a short time frame.
Cl 18(e)	An averaging period for a regulatory year must take place in the future.	At the time it is nominated, all dates in the averaging period must take place in the future.	If a regulated service provider can select an averaging period by looking at historical yields, it may introduce an upward bias.

Cl 18(f)	An averaging period for a regulatory year must be specified for each regulatory year within the regulatory control period.	An averaging period needs to be specified for each regulatory year within a regulatory control period.	This allows for the annual debt update. The annual debt update reduces the potential for a mismatch between the allowed and actual return on debt for the benchmark efficient entity.
Cl 18(g)	An averaging period for a regulatory year must not overlap for different regulatory years, although the averaging period is not required to be identical for each regulatory year.	The proposed averaging periods for different regulatory years are not required to be identical but should not overlap.	This avoids double counting averaging periods. This would detract from our specification of the trailing average, which weights periods equally. Not requiring periods to be identical helps preserve confidentiality and provide service providers with a degree of flexibility.
Cl 18 Note 19:	If the start date of any averaging period, nominated in accordance with clause 18 does not fall on a business day, then the start date of the averaging period must be deemed to be the next business day. If the end date of any averaging period, nominated in accordance with clause 18 does not fall on a business day, then the end date of the averaging period must be deemed to be the previous business day. This is to ensure that clause 18(a) and clause 18(b).	n/a	This sets out an adjustment mechanism for the start date and/or the end date of a nominated averaging period in cases where a nominated date falls on a non-business day (whether due to oversight or changes to public holidays subsequent to a regulatory proposal submission). Where an adjustment under Note 19 does not satisfy clause 18(c), the regulatory proposal will be deemed non-compliant and must be re-submitted, as per clause 18(a).

Source: AER analysis.

For the reasons set out in the table, we are satisfied that averaging periods based on these criteria will contribute to a return on debt approach that will promote achievement of the NEO, NGO and RPPs.

Averaging periods which do not meet these criteria

Based on the current draft legislation to implement a binding rate of return instrument, our expectation is that:

- service providers will be required to give effect to the binding rate of return instrument in making regulatory proposals
- we will be required to give effect to the binding rate of return instrument in making determinations.

In practice there is a possibility that, due to misunderstanding or oversight, a service provider may submit in its proposal averaging periods which do not give effect to the above criteria. If that is the case, our expectation is that the regulatory proposal would not be compliant with the rules requirements and would need to be re-submitted.

10.8 Contingencies

As discussed in section 9, our draft decision is to adopt an annually updating return on debt approach.

As a result, our decision on how to apply these 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. This principle applies equally if this guideline is binding.

For this reason, we have described series of contingencies below. These contingencies are set out formally in clause 19 of the draft rate of return instrument. They set out how we propose to estimate the annual return on debt in the event of revisions in the RBA's, Thomson Reuters' or Bloomberg's methodologies or other changes to data availability. The underlying principles for these contingencies are largely consistent with our current approach. However, we have updated and generalised aspects of our approach as a consequence of adding an additional curve provider and relying on two broad credit rating bands for each provider. 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—for example, in April 2015 Bloomberg commenced publication of a 10 year BVAL curve. Accordingly, for averaging periods where the 10 year estimate is available, we will adopt this estimate rather than extrapolating a shorter curve estimate.
- Where necessary, rely on the independent expert judgement of the RBA, Bloomberg and Thomson Reuters—In particular, where Thomson Reuters, 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 Guideline. However, this is not possible during the regulatory control or access arrangement period. In these circumstances, we therefore are faced with the two alternatives of ceasing to rely on the updated curve, or temporarily relying on the updated curve on the basis that we have assessed the data provider as credible. As we are satisfied that Thomson Reuters, the RBA and Bloomberg are credible and independent, but not that any curve is clearly superior, we consider it is preferable that we adopt the updated curve to limit stakeholders' exposure to the distinct characteristics of a single curve. This is consistent with our position of placing weight on both curves to minimise the mean squared error.
- 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 two of the three yield curve providers on a particular day, we will rely only on the remaining curve providers. While this results in a smaller data set, it reflects up-to-date data. Only where all third party yield curve providers cease publication will we rely on historical data.

Table 46 Contingencies for implementing the return on debt approach - Clause 19 of draft rate of return guideline

Clause No.	Event	Contingency approach
Cl 19 (a)	A curve provider on day i publishes either a broad A-rated or broad BBB-rated yield estimate with a term less than 10 years but greater than or equal to 7 years	The relevant yield estimate for day i must be linearly extrapolated to an exact term of 10 years in accordance with formulae set out in the (draft) rate of return guideline. For the avoidance of doubt, clause 19(a) also applies to all contingencies in clause 19, if it is necessary to extrapolate any yield estimates to an exact term of 10 years.
Cl 19(b)	A curve provider on day i does not publish both 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.	The yield for day i must be calculated in accordance with relevant clause in the (draft) rate of return guideline using the data from the remaining curve providers, subject to cl 19(c). For the avoidance of doubt, equal weighting must be adopted for the remaining curve providers. For example, if data is available only from two curve providers on day i, they will each have 50 per cent weighting.
Cl 19 (c)	All curve providers on day i do not publish both a broad A-rated and a broad BBB-rated yield estimate with term greater or equal to 7 years but less than or equal to an exact term of 10 years.	The applicable yield for day i will be calculated by: • calculating a simple average of the spread to10-year CGS over the preceding 100 business days for each broad A-rated and BBB-rated curve for all curve providers, which is added to: • the daily 10-year CGS yield estimates, to determine each curve provider's broad A-rated and broad-BBB rated yield estimates. For the avoidance of doubt, when calculating the average spread to 10-year CGS over the preceding 100 business days, all available daily yield estimates, for all curve providers must be used, as long as they have not been previously excluded to calculate the yield estimates due to clause 19(b). The daily 10-year CGS yield estimates must be calculated as set out in the (draft) rate of return guideline.
Cl 19 (d)	Any curve provider substitutes its current methodology for a revised or updated methodology	. The revised or updated methodology must be used to calculate the yield for day i as long as the yield estimates are obtained from the data sources as identified in the (draft) rate of return guideline. For the avoidance of doubt, if a curve provider ceases publication of its existing curves and publishes a new curve product, data sources other than those identified in the rate of return guideline, then we will not rely on the new curve product. The data provider will be taken to have ceased publication of the relevant curve.
Cl 19 (e)	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.
Cl 19 (f)	The RBA replaces its monthly publication with daily publication of yield estimates.	Linear interpolation is no longer necessary and the published daily estimates must be used to calculate the yield for day i and must be extrapolated to an exact term of 10 years if necessary in accordance with the rate of return guideline.
Cl 19 (g)	Either Thomson-Reuters or Bloomberg replaces their publication with another frequency of publication of yield estimates (for example, monthly).	The new yield estimates must be converted into daily yield estimates in accordance with relevant clauses in the rate of return guideline.

Source: AER analysis.

As addressed in section 10.4, the RBA has recently made material revisions to its historical data series on which our approach is based. In the next section, we discuss how this type of data change will be treated as a broader principle under this guideline.

How we will respond to retrospective changes in the data series we rely on

At the time we make determinations we use up-to-date information. For example, we use the most recent inflation estimates released prior to our final decisions. We follow this principle because:

- it contributes to estimates that are most reflective of efficient costs and most likely to promote achievement of the NEO/NGO and RPPs (and ARORO in the case of RoR)
- it is unbiased (changes can be positive or negative)
- each decision reflects market expectations, which should include the most up-to-date information, at the time of a decision. That is, the decision is appropriate in expectation.

Generally this principle is straightforward to apply, because decisions on parameter values within the rate of return typically apply only for one regulatory period. As a result, at each new determination, we consider afresh the estimate of a parameter or value.

In contrast, the adoption of a 10 year trailing average return on debt implies a methodology that spans multiple regulatory periods.

For most service providers this guideline will apply from year six of the transition to the trailing average return on debt. The portfolio estimates for year six (and onwards) in the transition path can be expressed as follows:

$$R_6 = (A_1 \times 50\%) + (A_2 \times 10\%) + (A_3 \times 10\%) + (A_4 \times 10\%) + (A_5 \times 10\%) + (A_6 \times 10\%)$$

$$R_7 = (A_1 \times 40\%) + (A_2 \times 10\%) + (A_3 \times 10\%) + (A_4 \times 10\%) + (A_5 \times 10\%) + (A_6 \times 10\%) + (A_7 \times 10\%)$$

$$R_8 = (A_1 \times 30\%) + (A_2 \times 10\%) + (A_3 \times 10\%) + (A_4 \times 10\%) + (A_5 \times 10\%) + (A_6 \times 10\%) + (A_7 \times 10\%)\%) + (A_8 \times 10\%)$$

$$R_9 = (A_1 \times 20\%) + (A_2 \times 10\%) + (A_3 \times 10\%) + (A_4 \times 10\%) + (A_5 \times 10\%) + (A_6 \times 10\%) + (A_7 \times 10\%)\%) + (A_8 \times 10\%) + (A_9 \times 10\%)$$

$$R_{10} = (A_1 \times 10\%) + (A_2 \times 10\%) + (A_3 \times 10\%) + (A_4 \times 10\%) + (A_5 \times 10\%) + (A_6 \times 10\%) + (A_7 \times 10\%)\%) + (A_8 \times 10\%) + (A_9 \times 10\%) + (A_{10} \times 10\%)$$

Where—

- Rn is the portfolio estimate in year n
- An is the annual estimate in year n

This illustrates that the portfolio estimates for year 6 and beyond depend in part on annual estimates for years 1 to 5 of the transition.

In line with determinations made since the 2013 Guidelines,[1432] our view is that:

- we will determine each annual estimate using the best information at the time
- once we have determined an annual estimate, we will continue to use that annual estimate for as long as it enters into a portfolio estimate.

Our key reasons for this view are that:

- This is consistent with the approach we've adopted to date, including for the Transgrid 2018-23 determination. This is the first instance of a service provider entering its second regulatory period under the trailing average approach.
- It is unbiased— in this instance, the changes would result in a downward revision to estimates. However, we consider there is an equal likelihood of any future revisions being upward or downward. During the current cycle of determinations we have not updated numbers in response to RBA data revisions where doing so would have increased annual estimates.
- It reduces regulatory uncertainty— in seeking to promote the NEO and NGO to the greatest degree, we weigh the consequences of any increase to regulatory uncertainty against the incremental improvement in estimates from the change in approach. With the passage of time and the benefit of hindsight, there could be a range of reasons why we now consider there are better estimates of numbers employed previously. In this case, it is probable that the updated RBA estimates are an improvement on its previous estimates. However, under CoAG's proposed legislative amendments for a binding rate of return instrument we must make a guideline that will be applied automatically. Therefore, we must account for any

[1432] See, for example, AER, Final decision: AusNet Services transmission determination—Attachment 3: rate of return, April 2017, p. 145.

unknown future changes. In any case, customers, networks and shareholders are likely to have made decisions based on the expectation that the previous estimates would continue to be employed.

Therefore, we consider the better view is to continue to use estimates that we previously set out in determinations even if there are reasons why we might now employ different estimates. Of course going forward, we will use the most up to date information to inform our decisions when developing new estimates. We are open to receiving submissions on this issue as we finalise the guideline.

10.9 Summary of submissions

This appendix details the submissions we have received from stakeholders as part of our review process to date, and notes how we have had regard to each submission.

Table 47 Summary of submissions on the return of debt

Key Point	Submission	Stakeholder	AER Response
Choice of curves	Support the review of third-party debt data series	Ergon Energy & Energex,[1433] CKI,[1434] Network Shareholder Group, [1435] ATCO,[1436] EUAA[1437]	As flagged in our issues paper, we have evaluated the available third party data series. Our analysis is set out in greater detail in the return on debt discussion paper and in section 10.4
	The RBA and Bloomberg third party data sources are well accepted and working well and should be maintained. Has a number of significant concerns in relation to the Reuters and S&P Global curves and considers that they should not be used at this stage	ENA[1438]	Our draft decision is to: • Maintain use of the BVAL and RBA curves; and • Add the Thomson Reuters blended AUD corporate curve to our curve mix. Our reasons for adopting the Thomson Reuters curve and not adopting the S&P Global curve are discussed in greater detail in section 10.4.
	Supports continued use of the current two providers. TR and S&P Global are not fit for purpose or appropriate. Further review of the new curves should be	SA Power Networks, Australian Gas Infrastructure Group, CitiPower, United Energy and Powercor[1439]	Our draft decision is to: • Maintain use of the BVAL and RBA curves; and • Add the Thomson Reuters blended AUD corporate curve

[1433] Ergon Energy and Energex, Submission on rate of return issues paper, December 2017, p5
[1434] Cheung Kong Infrastructure, Submission on rate of return issues paper, December 2017, p3
[1435] Network Shareholder Group, Response to issues paper on the review of the rate of return guideline, December 2017, p9
[1436] ATCO Gas Australia, Submission on rate of return issues paper, December 2017, p6-7
[1437] EUAA, submission – Submission on rate of return issues paper, December 2017, p8
[1438] Energy Networks Australia, Submission on Debt Paper, May 2018, p4
[1439] SAPN-CitiPower Powercor United Energy AGIG, Submission on Debt Paper, May 2018, p2

	done at the next guideline review.		to our curve mix. Our reasons for adopting the Thomson Reuters curve and not adopting the S&P Global curve are discussed in greater detail in section 10.4.
	The current approach of giving equal weight to the corporate yield estimates from the RBA and Bloomberg is appropriate Both estimates broadly move together over time and there is no evidence to suggest that either series is systematically biased upwards or downwards over the long-term The yield estimates produced by S&P Global have been materially and consistently lower than the simple average of the RBA and Bloomberg estimates. This may indicate a systematic downward bias, which makes the S&P Global series unsuitable for estimating the benchmark debt yield	QTC[1440]	Our draft decision is to: • Maintain use of the BVAL and RBA curves; and • Add the Thomson Reuters blended AUD corporate curve to our curve mix. Our reasons for adopting the Thomson Reuters curve and not adopting the S&P Global curve are discussed in greater detail in section 10.4.
	Supports continued use of the RBA and BVAL curves. Advice in the discussion paper does not give us confidence that TR and S&P Global are fit for purpose. Notes that TR estimates have been available since 2015 but not continuously	APGA[1441]	Our draft decision is to: • Maintain use of the BVAL and RBA curves; and • Add the Thomson Reuters blended AUD corporate curve to our curve mix. Our reasons for adopting the Thomson Reuters curve and not adopting the S&P Global curve are discussed in greater detail in section 10.4. We note that RBA's published 10 year estimate typically has an 'effective term' of 8 to 9 years. While TR does not extrapolate its curve and their 8 and 9 year estimates have been consistently available. We discuss this in greater detail in section 10.4
	No question regarding the market expertise of the four	APA[1442]	We agree that the RBA and BVAL curves have longer backcast time-

[1440] Queensland Treasury Corporation, Submission on Debt Paper, June 2018, pp3-4

[1441] Australian Pipelines and Gas Association, Submission on Debt Paper, May 2018, pp 5-6

[1442] APA, Submission on Debt Paper, May 2018, pp 4-6.

	providers. For overall fitness for purpose, the RBA and BVAL curves are superior as they have been subject to independent scrutiny. S&P Global and TR have relatively short series only.		series, and that a longer series is preferable where possible. However, we note that daily estimates of the Thomson Reuters AUD corporate curve has been published consistently since early 2015.
	Does not consider benefits in adding the two new curves, would not justify the additional administrative costs. Especially concerned with the S&P Global curve – not clear why it is such an outlier.	AusNet[1443]	In our view, the benefits of adding an additional data source, such as having an expanded curve mix to mitigate any shocks to outcomes in the event that a provider ceases publishing, outweigh the incremental administrative costs.
	Support the current use of the RBA and BVAL curves, and consider the other curves should be incorporated as back-up. RBA is useful as it publishes an A- curve. Availability of long time series is important.	Energy Australia[1444]	Our draft decision is to: • Maintain use of the BVAL and RBA curves; and • Add the Thomson Reuters blended AUD corporate curve to our curve mix. Our reasons for adopting the Thomson Reuters curve and not adopting the S&P Global curve are discussed in greater detail in section 10.4. We recognise that all of the curves have strengths and weaknesses, however: • All curve providers have made substantial information available regarding their bond selection criteria • There is a varying degree of public information available on the curve fitting methodologies for the four curve options, but in our view the providers have made a substantial amount of information available for public consultation. We set out this information in greater detail in the return on debt discussion paper. • We note that all of the third party yield curve providers have broad-BBB and broad-A rated curves available.
	Chairmont analysis is clear evidence that use of current data sources gives significantly higher return on debt allowance than the actual. MEU is concerned that the various sources of data is not transparent leading to no certainty that the data is appropriate or biased. The four series examined have failings to a varied extent. This implies that a combination of the available data series is therefore necessary.	Major Energy Users[1445]	
	CCP considers the TR	CCP16[1446]	In our view, there is substantial

[1443] AusNet Services, Submission on Debt Paper, May 2018, p3

[1444] Energy Australia, Submission on Debt Paper, May 2018, p2

[1445] Major Energy Users, Submission on Estimating the allowed return on debt Discussion paper, May 2018, pp 3-4

[1446] Consumer Challenge Panel 16, Submission to the AER on its allowed rate of return on debt discussion paper, 30 May 2018, pp 6,12

	series replicates the BVAL series on important bond selection criteria and to include TR with equal weighting would underweight the RBA series Add the TR series with a weighting of RBA 50 per cent, BVAL 25 per cent and TR 25 per cent. If S&P Global can provide a reliable longer time series, add S&P Global as well: RBA 50 per cent, BVAL, TR and S&P Global with 16.6 per cent each.		overlap between all four of the curve providers, but each have distinct characteristics. Further, we note that each provider has independently approached the question of how best to estimate AUD corporate bond yields. To the extent that BVAL and Thomson Reuters have adopted similar bond selection criteria, this might suggest that a majority of reliable providers have reached consensus. We consider there are strength and weakness in each of the providers curves but none are either superior or inferior to the other. Our draft decision is to apply equal (33 per cent) weighting to data from each of Bloomberg, the RBA and Thomson Reuters. Our reasons for this decision are set out in greater detail in section 10.4.
Weighting of the curve	Would not necessarily place the same weights we have placed on our findings, but acknowledge that Dr Lally and the Regulatory Economic Unit carried out comprehensive assessments of the RBA and BVAL curves	APGA[1447]	Our draft decision is to apply equal (33 per cent) weighting to data from each of Bloomberg, the RBA and Thomson Reuters. Our reasons for this decision are set out in greater detail in section 10.4.
	The benchmark debt yield should continue to be estimated by giving equal weight to corporate yield estimates from RBA and Bloomberg	QTC[1448]	Our draft decision is to: • Maintain use of the BVAL and RBA curves; and • Add the Thomson Reuters blended AUD corporate curve to our curve mix. Our reasons for adopting the Thomson Reuters curve and not adopting the S&P Global curve are discussed in greater detail in section 10.4.
	Weighting: 50 per cent RBA, 25 per cent BVAL, 12.5 per cent each TR and S&P Global. Each series should be separately weighted	CRG[1449]	Our draft decision is to apply equal (33 per cent) weighting to data from each of Bloomberg, the RBA and Thomson Reuters. Our reasons for this decision are set out in greater detail in section 10.4.
Benchmark Term	The 10 year benchmark	EE&E[1450] / CKI[1451]	Our draft decision is to maintain the

[1447] APGA, Submission on Debt Paper, May 2018, p4
[1448] QTC, Submission on Debt Paper, May 2018, p1
[1449] CRG, Submission on Debt Paper, May 2018, pp 2-3

	term should be maintained		current benchmark term of 10 years. Our reasons are set out in more detail in section 10.3
	If the actual cost of debt is relatively constant over time, the MEU considers that the term of debt should not be 'the driving force' in setting the allowed cost of debt. The MEU also recommends that the AER should undertake analysis where the term of debt is varied to see if this results in an outcome which more closely matches the observed cost of debt	Major Energy Users[1452]	We remain satisfied that a10 year benchmark term is appropriate for the reasons set out in 10.3. Having done so, we undertook analysis of spread differences at matched terms to test whether evidence of outperformance remained having taken term into account. We discuss this in greater detail in section 10.5
	Evidence does not support a change from 10 years. Chairmont report – understands the reasons for the absence of transparency in the analysis (but EISCI was about half of APA's credit spreads of past 6 years). Additional work is required before definitive conclusions can be drawn from the analysis.	APA[1453]	Based on APA's submission, it is unclear how APA's 'average interest rate' shown in their submission was calculated therefore unable to verify the comparison of APA's credit spreads to EISCI. To the extent APA's spreads to swap are high compared to the rest of the sample, this may reflect factors specific to APA.
	Does not agree 7.5 years should be a new benchmark term - AusNet is transitioning and longer term debt have been issued since 2013. AusNet debt maturity profile shows lengthening of debt term issued post 2013. Privatisation must have had an impact on the analysis. AER should present to stakeholders the materiality of the impact of privatisation. Consider inclusion of bank debt in the	AusNet[1454]	Our draft decision is to maintain the current benchmark term of 10 years. Our reasons are set out in more detail in section 10.3.

[1450] Ergon Energy and Energex, Issues paper - review of the rate of return guidelines, December 2017, p4-5

[1451] Cheung Kong Infrastructure, Submission on rate of return issues paper, December 2017, p3

[1452] Major Energy Users, Submission on Estimating the allowed return on debt discussion paper, 28 May 2018, p4-5

[1453] APA, Review of the rate of return guidelines APA submission responding to return on debt discussion paper, May 2018, p10

[1454] AusNet, Response to the AER's discussion paper on estimating the allowed return on debt, 30 May 2018, p1-2

	sample may need to be reviewed – AusNet only use these debt as an offset facility and usually undrawn.		
	Against lowering the term from 10 years. Evidence does not support a change from 10 years. APGA supports the AER working with stakeholders to develop a better understanding of the data and its implications.	APGA[1455]	Our draft decision is to maintain the current benchmark term of 10 years. Our reasons are set out in more detail in section 10.3
	Given the latest analysis, EA recommends reducing the tenor from 10 to 7.5 years – the AER adopted a 10 year term for the current RoRG when the average term at issuance by a representative sample of networks was 8.7 years. They do not consider additional regulatory uncertainty arises if a consistent principle is applied. Further transitioning may be required if this were to result in material differences to the current cost of debt estimate.	Energy Australia[1456]	Our draft decision is to maintain the current benchmark term of 10 years. Our reasons are set out in more detail in section 10.3
	The MEU considers that the AER assessment of the way each network addresses its debt is flawed in that there is an assumption that every network addresses its debt in the most efficient manner which will be in the long term interests of consumers. In fact, each network will address its debt management in the interests of its shareholders and therefore will be unique to each network MEU recommends that the AER should model more scenarios that simply the 10 years debt terms, e.g. modelling of a mix of credit ratings, various term of debt, to identify closer 'match to	Major Energy Users[1457]	In our view, networks have long term incentives to manage refinancing risks subject to cost and constraints of the markets. By periodically reviewing our benchmarks and implementation of those benchmarks having regard to actual debt raising practices, these behaviours can ultimately be reflected in forward looking regulatory allowances, promoting the long-term interests of consumers.

[1455] Australian Pipelines and Gas Association, Submission to the AER discussion paper estimating the allowed return on debt, 30 May 2018, p2, 8-9

[1456] Energy Australia, Submission to AER review of rate of return guideline Return on Debt, 21 June 2018, p1-2

[1457] Major Energy Users, Submission on Estimating the allowed return on debt discussion paper, 28 May 2018, p4

	the actual cost".		
	Supports the continued use of a 10-year tenor. The analysis by Chairmont does not support changing the current 10-year benchmark term	QTC[1458]	Our draft decision is to maintain the current benchmark term of 10 years. Our reasons are set out in more detail in section 10.3
Averaging Periods	It is important for service providers to set their own return on debt averaging periods in order to issue (or price) their debt to reasonably match their allocated allowance	ENA[1459]	We agree with this submission. Under our draft guidelines, service providers are able to nominate their averaging periods subject to a range of criteria that are unambiguous but allow substantial flexibility in terms of timing and length.
	Supports the current approach to return on debt averaging periods but submits that the further conditions set out in revenue determinations (no later than 25 business days before a service provider submits a pricing proposal and commence no earlier than 12 months and 25 business days) should be specified	EE&E[1460]	We agree with this submission and have implemented similar criteria although our draft guideline criteria are specified relative to commencement of a regulatory year. This is because not all service providers submit pricing proposals.
	Averaging periods should be set by the AER and be consistent	Major Energy Users[1461]	We agree that our current approach for estimating averaging periods remains mostly appropriate for the purposes of implementing the return on debt approach.
Credit Rating Band	Even using a 2:1 ratio to weight the A and BBB series only slightly closes the gap between the AER series and the industry index.	CRG[1462]	We propose to adopt a 2/3:1/3 weighting of broad BBB to broad A curves. We consider a broad-BBB yield curve is likely to overstate the yield required for a BBB+ benchmark. For the reasons set out in this chapter, we consider this is supported on both a conceptual and empirical basis.
	Should continue to use broad-BBB. AER suggested combination of 2/3 broad-	APA[1463]	We propose to adopt a 2/3 broad-BBB 1/3 broad-A weighting. We consider a broad-BBB yield curve is

[1458] Queensland Treasury Corporation, Submission to the AER estimating the allowed return on debt discussion paper May 2018, p1-3

[1459] ENA, Submission on rate of return issues paper, December 2017, p17

[1460] EE&E, Submission on rate of return issues paper, December 2017, p4

[1461] Major Energy Users, Submission on rate of return issues paper, December 2017, p15

[1462] Consumer Reference Group, Estimating the allowed return on debt - response to discussion paper, 29 May 2018, p3

[1463] APA, Submission responding to return on debt discussion paper, 31 May 2018, p11

	BBB and 1/3 broad-A is not supported		likely to overstate the yield required for a BBB+ benchmark. For the reasons set out in this chapter, we consider this is supported on both a conceptual and empirical basis.
	Should continue to use broad-BBB. AER suggested combination of 2/3 broad-BBB and 1/3 broad-A is not supported.	APGA[1464]	We propose to adopt a 2/3:1/3 weighting of broad BBB to broad A curves. We consider a broad-BBB yield curve is likely to overstate the yield required for a BBB+ benchmark. For the reasons set out in this chapter, we consider this is supported on both a conceptual and empirical basis.
	While Chairmont's results are not definitive, clearly confirm the view of consumers and CCP16 that the AER's current approach on RoD is conservative. Suggests we should focus on developing our own debt database. Recommends adopting a weighted average of the broad-A and broad-BBB series, the actual weighting is still an open question	CCP16[1465]	We consider the EICSI and our analysis of spread differences are matched term support a conceptual expectation that the use of a broad-BBB credit rating is likely to be conservative. We agree and intend to continue collecting data in line with the current request and further refinement
Benchmark credit rating	EA estimates the current approach of using a broad-BBB adds about 10-15BP to the cost of debt. "A tiered credit rating approach using a credit rating of A- and then BBB might provide a more accurate credit rating profile across the industry."	Energy Australia[1466]	We do not agree. We consider the empirical evidence indicates the industry (median) credit rating is BBB+. However for implementation methodology, we are proposing a weighted average of broad-BBB and broad-A which we consider better reflect the BBB+ level credit based on our analysis.
	MEU considers that AER has to implement an approach &/or implementation which reasonably better matches the actual costs of debt as	Major Energy Users[1467]	For the reasons set out in this chapter, we consider the empirical evidence supports our proposal to maintain the benchmark credit rating of BBB+. We do not agree. We consider the empirical evidence indicates the industry (median)

[1464] Australian Pipelines and Gas Association, Submission to the AER discussion paper estimating the allowed return on debt, 30 May 2018, p4

[1465] Consumer Challenge Panel 16, Submission to the AER on its allowed rate of return on debt discussion paper, 31 May 2018, p4, 9 & 28

[1466] Energy Australia, Response to AER discussion paper estimating the allowed return on debt, 30 May 2018, p1

[1467] Major Energy Users, Submission on Estimating the allowed return on debt discussion paper, 28 May 2018, p3

	seen in Chairmont's report. 'The credit rating for the BEE should be A or A-, similar to that shown for ETSA and AusNet which probably more closely reflect the BEE than other firms in the AER listing': MEU does not consider 'the observed data reflects the reality of the BEE and its lower risk profile as the data includes more than BEE activities'.		credit rating is BBB+. However for implementation methodology, we are proposing a weighted average of broad-BBB and broad-A which we consider better reflect the BBB+ level credit based on our analysis.
	APGA states that the majority of credit ratings from companies in our sample are BBB or BBB+.	APGA[1468]	The proportion of companies in our sample in our discussion paper[1469] rated BBB+ was 50 per cent, 71 per cent were rated BBB or BBB+ which was less than those rated BBB+ or A- which counted for 78 per cent. We have consistently estimated our benchmark credit rating using the median which in our view, best estimates the central tendency of the sample.
	Suggests a BBB+ benchmark credit rating would be conservative.	ENA[1470]	The proportion of companies in our sample rated BBB+ was 50 per cent, 71 per cent were rated BBB or BBB+ which was less than those rated BBB+ or A- which counted for 78 per cent. We have consistently estimated our benchmark credit rating using the median which in our view, best estimates the central tendency of the sample.
Overall approach and implementation	Possible alternative approach for the rate of return - a defined margin (160bp) over BBSW	CRG[1471]	Based on the evidence before us, the spreads at which networks raise debt appear to be more stable on average than the third party curves. In principle, we agree that this may support some reliance on a fixed average margin, possibly in addition to a variable component reflecting third party yield curves. However we do not proposed to adopt this approach at this stage as, in our view, it is too material a change in approach to be made on

[1468] Australian Pipelines and Gas Association, Submission to the AER discussion paper Estimating the allowed return on debt, 30 May 2018, p4

[1469] AER, Discussion paper - Review of rate of return guideline - Estimating the allowed return on debt, May 2018, p15

[1470] Energy Networks Association, Estimating the allowed return on debt - Response to AER discussion paper , 31 May 2018, p6

[1471] CRG, Estimating the allowed return on debt - response to discussion paper, 29 May 2018, p2

			empirical grounds over a five year sample.
	AER should estimate a DRP based on the Chairmont analysis of 150BP. Debt allowance for 2019 should be 90day BBSW + identified debt allowance Analyse the 2018 actual debt data and incorporate it into the debt cost series and refine the DRP to be applied for 2020.	Major Energy Users[1472]	Based on the evidence before us, the spreads at which networks raise debt appear to be markedly more stable on average than the third party curves. In principle, we agree that this may support some reliance on a fixed average margin, possibly in addition to a variable component reflecting third party yield curves. However we do not proposed to adopt this approach at this stage as, in our view, it is too material a change in approach to be made on empirical grounds over a five year sample.
	Submit that we should maintain the current RoD approach and implementation methodologies. Any changes should meet a high threshold. Do not consider that the information presented by the AER in the paper supports a change to the benchmark term or credit rating. Indicates that analysis of networks' actual debt cost is inconsistent with an incremental review Submits that the EICSI is inappropriate because, among other reasons, there are no pure play NSPs in the sample	Network Shareholder Group[1473]	We do not propose to change the approach as we consider there was not sufficient evidence to support it. However we are proposing a change to the mix of credit rating band in implementation methodology as based on our analysis, it will better reflect the benchmark credit rating which is maintained at BBB+ We do not agree. Like all other aspects of the benchmark regulatory framework, examination of outturn performance is a useful source of evidence for considering the appropriate forward looking performance.
	Considers Chairmont's analysis has material limitations. Want to work further with AER to fully understand the analysis. As it stands, it does not provide sufficient evidence to warrant any change to the RoD approach	SA Power Networks, Australian Gas Infrastructure Group, CitiPower, United Energy and Powercor[1474]	We would expect the risk of default and potential loss given default to be low for regulated NSPs compared to unregulated networks. As such, we expect the EISCI may, if anything, understate the difference between a pure-play service provider and benchmark spreads. Broadly, we consider Chairmont's approach in aggregating the EICSI

[1472] Major Energy Users, Submission on Estimating the allowed return on debt discussion paper, 28 May 2018, p6

[1473] Network Shareholder Group, Submission to the AER's discussion paper on estimating the allowed return on debt, 31 May 2018, p1 & 4

[1474] SA Power Networks, Australian Gas Infrastructure Group, Citipower, United Energy & Powercor (the Businesses), AER discussion paper - estimating the allowed return on debt, 31 May 2018, p2

			is reasonable and fit-for-purpose. We recognise that there may be some further refinement to take place, however we have sensitivity tested our conclusions for concerns raised by the networks to the extent we agree they are material. Our analysis is set out in this chapter.
	Supports the position put forward by the CRG that the rate of return settings have failed to achieve consumer outcomes. Particularly that: The reduction in risk faced by the service providers afforded by the rules are not reflected in lower returns through the rate of return settings; and the lack of data on actual returns against modelled returns, significantly reduces confidence in the AER's ability to make informed decision on the guidelines settings	Agriculture Industries Energy Taskforce[1475]	We recognise that achieving outcomes that promote the long-term interests of consumers require us to periodically review our approach to test it remains appropriate and reflective of efficient financing practices and a level of risk commensurate with the risk involved in providing network services. We have sought to achieve this outcome by re-evaluating both our benchmarks
	The ENA made a series of further submissions on general methodological issues relating to the EICSI and our analysis of it. These include submissions relating to: • Comparison of 12 month trailing averages • The inclusion or exclusion of callable debt • Overweighting of short term instruments in a simple average • Exclusion of callable and subordinated debt • Treatment of fees • Exclusion of 2018 data.	Energy Networks Australia[1476]	We agree to further engage with networks on Chairmont's analysis so that it is fully understood by the stakeholders. This was necessary to protect the confidential nature of the information. Our response to these issues in in appendix B. The comparison of spreads at matched term to maturity provided empirical evidence that the networks have materially and consistently outperformed our current approach.
	On Chairmont's EICSI time series, APGA points that a	APGA[1477]	We acknowledge that market rates may move over time and regulatory

[1475] Agriculture Industries Energy Taskforce, Submission on Debt Paper, 1 June 2018, p2

[1476] Energy Networks Australia, Response to AER discussion paper estimating the allowed return on debt, 31 May 2018, p3, 21-22

[1477] Australian Pipelines and Gas Association, Submission to the AER discussion paper Estimating the allowed return on debt, 30 May 2018, p7

	number of final decisions occurred over the period when the difference between spreads and issuance is at its lowest.		determinations may be made when these rates are relatively high or low. Past patterns in this regard may not continue in the future.
	Submits that networks have considerable flexibility in tenor and volume of debt they issue.	CCP16[1478]	Our discussions with the networks and our analysis on the data suggest that the networks have some flexibility but are constrained to an extent by refinancing and liquidity management within treasury policies which also involve rating agency compliance.
	Submits that the AER's sample considers only regulated firms. Suggests the sample should include broadly comparable unregulated firms Submits that the actual debt cost analysis should not include NSW privatisations Argues that low refinancing risk is necessary to maintain BBB+ credit rating at high gearing levels. To address refinancing risk, QTC indicates a service provider should refinance early and reinvest the proceeds in a risk free asset to offset the cost The current transition should be left to run its course	QTC[1479]	We do not agree that the EICSI should exclude newly privatised networks. We note that, as part of its methodology, Chairmont has excluded special purpose debt such as bridging loans. To the extent that the acquisition phase in network privatization is not reflect of 'business as usual' debt raising, we consider Chairmont's criteria appropriately control for this. We are not persuaded that debt issued by newly privatized networks after the initial acquisition phase should be excluded from the sample.

[1478] Consumer Challenge Panel 16, Submission to the AER on its allowed rate of return on debt discussion paper, 31 May 2018, p5

[1479] Queensland Treasury Corporation, Estimating the allowed return on debt discussion paper submission to the Australian Energy Regulator, 4 June 2018, p1-2

11 Imputation credits

Our draft decision is to set a value for imputation credits (or gamma value) of 0.5 from a range of 0.3 to 0.6.[1480]

Our estimate of 0.5 is rounded to one decimal place from an estimate of 0.53 based on the product of an estimated utilisation rate of 0.6 and an estimated payout ratio (or distribution rate) of 0.88. Given the precision of the underlying data we consider rounding the value of imputation credits to one decimal place is appropriate. This is consistent with our existing approach set out in the 2013 Guidelines.

We have used a payout ratio of 0.83 in this draft instrument to be internally consistent with our rounded gamma value of 0.5 and our utilisation rate of 0.60.

We have continued to apply a 'utilisation' approach to estimating the value of imputation credits, an approach found to be open to us by the Full Federal Court in May 2017.[1481] In coming to this decision we have reviewed the relevant evidence and weight to put on this evidence.

The change in our estimated value of the imputation credits to 0.5 relative to our most recent TransGrid determination released in May 2018 (that applied 0.4) reflects further consideration of the relevant material in this review process. This is driven by:

- Placing primary weight on Lally's updated distribution rate estimate from the financial reports of the top 20 ASX listed firms. This suggests a distribution rate of at least 0.88.[1482] Previously, we placed most reliance on the Australian Taxation Office (ATO) franking account balance (FAB) data that suggested a distribution rate of 0.7 for all equity and 0.75 for listed equity.[1483] However, the ATO in a recent note and subsequent meeting advised the AER that the ATO FAB data should not be used for detailed time series analysis of Australia's imputation system.[1484] In light of the ATO's advice and having considered all the other information before us, we now place no reliance on the ATO FAB data. We also no longer consider a market wide distribution rate is appropriate for the benchmark efficient entity.

[1480] In this document we use 'value of imputation credits' and 'gamma' interchangeably. It is common to refer to the value of imputation credits as gamma.

[1481] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, p. 216.

[1482] We note a distribution rate of 0.88 and a utilisation rate of 0.6 give a value of imputation credits of 0.53. This is rounded to 0.5 if we keep one decimal place for the value of imputation credits. To ensure consistency between rate of return parameters given we have used an overall value of imputation credits of 0.5 and a utilisation value of 0.6 (for MRP), this implies a distribution rate of 0.83.

[1483] See the AER's draft decision for TransGrid or ElectraNet for detail.
The AER, *draft decision: TransGrid transmission determination 2018 to 2023- Attachment 4: Value of imputation credits*, September 2017; The AER, *Draft decision for ElectraNet transmission determination 2018 to 2023, Attachment 4- Value of imputation credits*, October 2017

[1484] ATO, ATO Note – Franking account balance – tax of time series data from Taxation Statistics, 9 May 2018; AER, AER minute of 21 June 2018 ATO meeting with ATO staff and comments on ENA summary, 5 July 2018.

- An increase in the utilisation rate estimates from the equity ownership approach. Our most recent updated estimates based on Australian Bureau of Statistics (ABS) data for all equity suggests a range for the utilisation rate of 0.6 to 0.7, whereas the utilisation rate for all equity and listed equity in our most recent ElectraNet draft decision suggested a range of 0.57 to 0.68 and 0.38 to 0.55.[1485] The most recent quarters' ABS equity ownership data supports a utilisation rate based on all equity of around 0.65.[1486]

This document does not attempt to cover in detail the theoretical, empirical and legal debate that has occurred since 2013. Rather, it focuses on the incremental change in information since 2013, our understanding of the law as clarified by the Full Federal Court, and the material put before us in this process. For parties interested in more detail on the theoretical, legal and empirical debates over this period, we recommend reading the 2013 Guidelines explanatory documents, the Full Federal Court decisions for Ausgrid and South Australia Power Networks (SAPN), the Australian Competition Tribunal decisions for SAPN and ActewAGL Gas Distribution, and our most recent decision on the value of imputation credits as set out in the attachment 4 for the ElectraNet Draft Decision.[1487]

While there is support for a slightly higher value of imputation credits of around 0.6 based on the most recent all equity Australian equity ownership rate of 65 per cent and a distribution rate of at least 0.88 based on Lally's updated work, we consider an incremental move upwards to 0.5 appropriate at this time. The use of 0.60 for the utilisation rate is also consistent with Lally's most recent advice.[1488]

We also note for the purposes of consistently estimating the post company tax return on equity, we have applied a value for the utilisation rate of 0.6. We consider a value of imputation credits of 0.5 when used with a consistently estimated vanilla rate of return based on a utilisation rate of 0.6 will best achieve the National Electricity Objective / National Gas Objective (NEO/NGO) in light of the evidence currently before us.

11.1 Introduction

Imputation credits are valuable to investors and are therefore a benefit in addition to any cash dividend or capital gains they receive from owning shares. Under the

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[1485] The AER, *Draft decision for ElectraNet transmission determination 2018 to 2023, Attachment 4- Value of imputation credits*, October 2017

[1486] The most recent December 2017 ABS data release indicates the point estimate of the domestic equity ownership of the Australian equity market at December 2017 is 0.65.

[1487] The AER, *Explanatory statement- Rate of return guideline*, December 2013; The AER, *Explanatory statement- appendices- Rate of return guideline*, December 2013; Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017; Federal Court of Australia, *SA Power Networks v Australian Competition Tribunal (No 2) [2018] FCAFC 3*, Jan 2018, para. 56; Australian Competition Tribunal, *Application by SA Power Networks [2016] ACompT 11*, 28 October 2016; Australian Competition Tribunal, *Application by ActewAGL Distribution [2017] ACompT 2*, 17 October 2017; The AER, *Draft decision for ElectraNet transmission determination 2018 to 2023, Attachment 4- Value of imputation credits*, October 2017

[1488] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 18.

Australian imputation tax system, investors can receive an imputation credit for income tax paid at the company level.[1489] For eligible investors, this credit offsets their Australian income tax liabilities. If the amount of imputation credits received exceeds an investor's tax liability, that investor can receive a cash refund for the balance.

The National Electricity Rules and National Gas Rules (NER/NGR) recognise that a service provider's allowed revenue does not need to include the value of imputation credits. Under the NER/NGR, service providers are to recover revenue that compensates them for their efficient costs in providing network services. This includes, among other things, a return to be provided to equity investors (return on equity) that is required to promote efficient levels of investment. The more that imputation credits are valuable, the less return that equity investors require from dividends and capital gains. However, the estimation of the return on equity is not adjusted directly to account for imputation credits.[1490] Therefore, an adjustment for the value of imputation credits is required. This adjustment could take the form of a decrease in the estimated return on equity itself.

An alternative but equivalent form of adjustment, which is employed by the NER/NGR, is via the revenue granted to a service provider to cover its expected tax liability. Specifically, the NER/NGR require that the estimated cost of corporate income tax be determined in accordance with a formula that reduces the estimated cost of corporate tax by the 'value of imputation credits' (represented by the Greek letter, γ, 'gamma').[1491] This form of adjustment recognises that it is the payment of corporate tax which is the source of the imputation credit return to investors.

11.1.1 Approach to date

To estimate gamma, we have used the Monkhouse (1996) formula. The Monkhouse formula is a common way to model the value of imputation credits to investors. It implies that the value of imputation credits is the product of a payout ratio and a utilisation rate. However, both of these parameters are conceptually complex and difficult to estimate. Experts on the value of imputation credits have advocated a range of values that investors place on generated imputation tax credits. These span from zero, meaning no value, to one, meaning full value, and different points within this range.

In 2009, the AER conducted its own review of the value of imputation credits as part of the 2009 WACC review. In that review, we adopted 0.65 as the value for imputation credits, made up of:

- a payout ratio of 1

[1489] Income Tax Assessment Act 1997, parts 3–6.

[1490] While the return on equity is not reduced to take into account the value of imputation credits, we note our estimate of the market risk premium (MRP) does consider the value we use for imputation credits to ensure it reflects the value to investors in the domestic Australian market inclusive of credits.

[1491] NER, cll. 6.4.3(a)(4), 6.4.3(b)(4), 6.5.3, 6A.5.4(a)(4), 6A.5.4(b)(4), 6A.6.4; NGR, rr. 76(c), 87A.

- a utilisation rate of 0.65—calculated as an average of the Beggs and Skeels dividend drop off study (0.57)[1492] and the Handley and Maheswaran tax statistic study (0.74).[1493]

We then applied a value of imputation credits of 0.65 in the Queensland and South Australian electricity distribution determinations. Energex and Ergon successfully appealed this decision to the Tribunal. The Tribunal set the payout ratio to 0.7 and commissioned a dividend drop off study from SFG.[1494] The Tribunal adopted SFG's recommendation that the utilisation rate (or theta) be set at 0.35.

In 2011, we adopted a value of imputation credits of 0.25, which was the product of:

- A payout ratio (F)—0.7
- A utilisation rate (θ)—0.35.

This was on the basis of the Australian Competition Tribunal adopting these values.[1495]

In the development of the 2013 Guidelines the AER conducted a further review of the value of imputation credits. In that review, we proposed that the value of imputation credits should be set with regard to a benchmark efficient entity informed by market wide behaviour rather than with regard to industry or firm specific values.[1496] Applying this approach, we adopted 0.5 as the value of imputation credits in the AER Rate of Return Guideline published in Dec 2013. This was the product of:

- A payout ratio of 0.7
- A utilisation rate of 0.7

Since 2015, we have adopted a value for imputation credits of 0.4 for the final decisions released in 2015, 2016, 2017 and 2018, from within a range of 0.3 to 0.5.[1497] This was a departure from the value of 0.5 estimated in our 2013 Guidelines, which we made after re-examining the relevant evidence and estimates.

We departed from the 2013 Guidelines reasoning by not relying upon the 'conceptual goalposts approach'. This was based on advice from Handley indicating this approach is not a reasonable approach to estimating the utilisation rate.[1498] In addition, in the 2013 Guidelines we considered that the equity ownership approach supported a

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[1492] D. Beggs and C.L. Skeels, *'Market arbitrage of cash dividends and franking credits'*, The economic record, Vol. 82, No. 258, September 2006, p. 247.

[1493] J.C. Handley and K. Maheswaran, *'A measure of the efficacy of the Australian imputation tax system'*, The economic record, Vol. 84, No. 264, March 2008, p. 90.

[1494] Australian Competition Tribunal, Application by Energex Limited (No 2) [2010] ACompT 7, October 2010, para. 147.

[1495] Australian Competition Tribunal, Application by Energex Limited (Gamma)(No 5) [2011] ACompT 9, May 2011, para. 42.

[1496] AER, *Rate of return guideline*, December 2013, p. 23.

[1497] We first adopted this value on our November 2014 draft decisions for Ausgrid and others.

[1498] J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, September 2014, p. 31.

utilisation rate of between 0.7 and 0.8. After the publication of the 2013 Guidelines we re-examined the relevant data from the national accounts. This resulted in us updating and refining our estimates. The updated estimates from the equity ownership approach indicated a lower utilisation rate.[1499]

We have also had regard to the distribution rate for listed equity estimated from ATO data and estimated from the 20 largest ASX-listed firms in estimating the value of imputation credits. However, we have placed no weight on the estimate from ATO franking account balance data in light of recent ATO advice. We agree with Lally's advice that the distribution rate is a firm-specific parameter and with his recommendation that a distribution rate estimated from listed equity is a more appropriate benchmark than an estimate based on all equity data.[1500] We noted in the 2013 Guidelines we only considered the distribution rate across all equity.

We now consider that:

- It is open to us to have regard to evidence from all equity and/or listed equity only
- It is not necessary to combine estimates of the distribution rate and utilisation rate from the same dataset.

11.2 AER's assessment approach

In this section we set out the approach we have taken to assessing proposals on the value of imputation credits. This approach includes consideration of:

- the requirements of the NEL/NGL and NER/NGR
- legal processes
- our definition of the benchmark efficient entity
- interrelationships
- issues discussed in the concurrent evidence session and submissions

11.2.1 Regulatory requirements

The objective of the adjustment for the value of imputation credits is to reduce the cost of corporate income tax such that only the proportion of company tax which is expected to be retained by the government is reflected in the corporate income tax building block. That is, the adjustment is an estimate of the company tax paid which the government subsequently transfers to investors when they utilise imputation credits.

[1499] AER, *Draft decision: Ausgrid distribution determination 2015-16 to 2018-19, Attachment 4: Value of imputation credits*, November 2014, pp. 14-19.

[1500] Lally's view on this issue appears consistent with the views of Gray. See Frontier Economics, *An appropriate regulatory estimate of gamma*, June 2015, pp. 12–13; M. Lally, Gamma and the ACT decision, 23 May 2016, p. 5.

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. This 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:
>
> $ETC_t = (ETI_t \times r_t)(1 - \gamma)$
>
> Where:
>
> ETIt 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

11.2.2 Legal processes

Since the 2013 Guidelines review the key issue that has been in dispute over the past few years is the meaning of "value" in the statutory context. Most of the businesses have taken the word "value" as the market value of imputation credits to investors as reflected in market prices and have proposed that the value of imputation credits should be examined principally through implied market value studies.

By contrast, we have taken the view that the value of imputation credits is a post company tax (post-tax) value before the impact of personal taxes and transaction costs.[1501] Importantly, the concept of 'value' must be considered in this context. As such, we view the value of imputation credits as the proportion of company tax expected to be returned to investors through the utilisation of imputation credits (a 'utilisation' approach to theta and to the value of imputation credits).

The issue has been considered in a number legal processes and we consider is largely settled after the Full Federal Court's decisions for Ausgrid and SAPN.[1502] The Court in its May 2017 and January 2018 decisions upheld the AER's decision on the value of imputation credits and considered it was not an error of construction for the AER to

[1501] Post-tax refers to after company tax and before personal tax.

[1502] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79,* May 2017; Federal Court of Australia, *SA Power Networks v Australian Competition Tribunal (No 2) [2018] FCAFC 3*, Jan 2018.

focus on utilisation rather than on implied market value.[1503] In coming to the decision for this draft instrument, we have taken into account the outcome of the recent litigation. We consider our interpretation of the value of imputation credits is consistent with the result of the recent litigation and will contribute to the achievement of the NGO and NEO. We discuss the outcome of the recent litigation in detail in Appendix A.

11.2.3 Definition of a benchmark efficient entity

The NER/NGR refer to a 'benchmark efficient entity'. We consider that the benchmark efficient entity (BEE) is to be taken as having 'a similar degree of risk' as that which applies to the particular service provider in providing its 'regulated' network services.[1504] This is consistent with the Full Federal Court's decision that was handed down in May 2017.[1505] The definition of a benchmark efficient entity we use for determining the rate of return is identical to the definition we use for determining the value of imputation credits in this draft instrument. We also note that as the NER and NGR are drafted, the benchmark firm pays tax at the relevant Australian corporate tax rate.

We consider one important element of the definition of a benchmark efficient entity is 'operating within Australia'. This is because the location of a business determines the conditions under which the business operates. This includes the regulatory regime, tax laws, industry structure and broader economic environment that impact the risks faced by the service provider in the provision of its regulatory services. An additional consideration that is particularly relevant to the value of imputation credits is that we recognise that both domestic and foreign investors participate in the Australian market. That is, we consider that the defined market is an Australian domestic market that recognises the presence of foreign investors to the extent that they invest in the Australian market. This is important for determining a value of imputation credits because typically domestic investors are eligible to utilise imputation credits while foreign investors are not.

11.2.4 Interrelationships

The NER/NGR recognise that a service provider's allowed revenue does not need to include the value of imputation credits. The NER/NGR adjust for the value of imputation credits via the revenue granted to a service provider to cover its expected tax liability. This form of adjustment recognises that it is the payment of corporate tax which is the source of the imputation credit returned to investors.

[1503] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79,* May 2017, para. 756.
Federal Court of Australia, *SA Power Networks v Australian Competition Tribunal (No 2) [2018] FCAFC 3*, Jan 2018, para. 56.

[1504] By regulated services we mean services that are subject to 'full' revenue cap or price cap regulation. This will be firms we regulate that provide standard control services and prescribed transmission services

[1505] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017. Para. 537.

The value of imputation credits is also interrelated with the market risk premium (MRP). The definition of the MRP in the Sharpe-Lintner capital asset pricing model (CAPM) should account for the capitalised value of imputation credits. Accordingly, in our determination of the return on equity in the draft instrument we adjust estimates of the MRP in a manner consistent with our determination of the value of imputation credits. This is also required by the NER/NGR.[1506]

11.2.5 Issues from the concurrent evidence session and submissions

We released an issues paper in October 2017 outlining key areas of the Guideline review process. In March 2018, we released a discussion paper on imputation credits to provide background on the matters to be discussed at the concurrent evidence session and questions to frame that discussion.[1507] We have received a number of submissions from stakeholders in response to the papers we released on the value of imputation credits and in relation to issues discussed in the concurrent evidence session. In reaching our decision for this draft instrument, we have taken into account the issues discussed in the stakeholder submissions as well as the issues raised by the experts in the concurrent evidence session. We respond to these issues in detail in Appendix A.

The key issues on the value of imputation credits raised by the stakeholders include:

- whether a direct estimate of the value of imputation credits for the benchmark efficient entity can be obtained from the ATO tax statistics[1508]
- the suitability of adopting the distribution rate of firms in the 20 largest ASX listed firms or the market as a whole as a proxy for the benchmark efficient entity[1509]
- whether a distribution rate can be estimated from a set of comparators[1510]

[1506] NER, cll. 6.5.2(d)(2), 6A.6.2(d)(2); NGR, r. 87(4)(b).

[1507] AER, *Discussion paper gamma*, March 2018

[1508] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 12; NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 3; CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 74; Joint Energy Networks, *submission to the AER*, 4 May 2018, pp. 6-7; Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6; ATCO Gas, *Submission to the AER: Review of rate of return guideline-evidence sessions*, 4 May 2018

[1509] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 11; NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 18; APGA, *Submission to the Issues Paper*, 12 December 2017, p. 10; Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6; CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, pp. 77-78

[1510] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 16.
CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 131.

- whether a utilisation of 1 may be appropriate given that the model assumes the national equity markets are segmented and hence all the assets in the equity markets are owned by domestic investors and there is no foreign investment[1511]
- issues with using the ABS equity ownership data for estimating the utilisation rate[1512]

11.3 Our draft approach

Having considered all the information before us, consistent with our approach since the 2013 Guidelines, we propose that the value of imputation credits within the building block revenue framework is an estimate of the expected proportion of company tax which is returned to investors through utilisation of imputation credits. This 'utilisation' approach considers that the value of imputation credits is a post-tax value before the impact of personal taxes and transaction costs.[1513] This is consistent with the Officer framework, which models the value of imputation credits via the parameter gamma (usually labelled using the Greek letter, γ):[1514]

> γ [gamma] is the proportion of tax collected from the company which gives rise to the tax credit associated with a franked dividend.

This 'utilisation' approach to the value of distributed imputation credits was confirmed as legally open to us by the Full Federal Court in May 2017 where the Court found it was not an error of construction for the AER to focus on utilisation rather than on implied market value.[1515]

Further, and consistent with the Monkhouse formula and our approach since the 2013 Guidelines, we propose to estimate gamma as the product of two parameters:[1516]

The payout ratio, which is the proportion of imputation credits generated by the benchmark efficient entity that are distributed to investors.[1517]

[1511] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, pp. 106-108; CRG, *Submission to the AER on its Rate of Return Guideline Review*, May 2018, p. 60.

[1512] ENA, Response to AER Issues Paper, 12 December 2017, p. 37;
Cheung Kong Infrastructure, Review of the Rate of Return Guideline, 12 December 2017, pp. 5-6;
APGA, Submission to the AER: Review of rate of return guideline, 4 May 2018, p. 16;
ENA, Response to discussion papers and concurrent expert evidence sessions, 4 May 2018, p. 91.

[1513] Post-tax refers to after company tax and before personal tax.

[1514] R. Officer, 'The cost of capital of a company under an imputation tax system', Accounting and finance, May 1994, vol. 34(1), p. 4.

[1515] Federal Court of Australia, Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79, May 2017, para. 756.

[1516] See P. Monkhouse, 'The Valuation of Projects Under the Dividend Imputation Tax System', Accounting and finance, 1996, vol. 36(2), pp. 185–212.

[1517] The imputation credit payout ratio is distinct from the dividend payout ratio, which is the proportion of available firm free cash flow distributed to equity holders via dividends. This choice of terminology is consistent with the draft instrument and most submissions on this issue. It is sometimes called the distribution rate or the access fraction, and in equations is sometimes referred to using the symbol F.

The utilisation rate, which is the extent to which investors can use the imputation credits they receive to reduce their personal tax.[1518]

We propose that the value of imputation credits, in particular the distribution rate, be set with regard to a benchmark efficient entity using appropriate benchmark estimates rather than with regard to market wide behaviour. We do not consider the observed distribution rates of private firms under the Australian imputation system are reflective of an appropriate benchmark distribution rate. Whereas, we consider the utilisation rate is appropriately set as a market wide parameter.

Applying this approach, overall, the evidence suggests a range of estimates for the value of imputation credits might be reasonable. We propose to choose a value of imputation credits of 0.5 from within a range of 0.3 to 0.6.

11.3.1 Payout ratio

In estimating the payout ratio, we propose to continue to use the cumulative payout ratio approach we have adopted since the 2013 Guidelines. This approach calculates the proportion of imputation credits generated (via tax payments) that have been distributed by companies over a certain period of time. We have considered the strengths and limitations of the relevant evidence. The body of evidence includes:

- An estimate by Lally based on the top 20 ASX-listed firms' financial reports
- ATO tax statistic based estimates
- estimates of potential comparators' distribution rates based on the data from the financial reports

Our estimate of 0.83 for the distribution rate is based on:

- giving primary weight on the updated estimate from Lally's top 20 ASX-listed firms' financial reports, which suggests an estimate of at least 0.88 after adjusting for the credits recycled
- having regard to ATO tax statistics estimate (dividend data), which suggests an estimate of 0.57 for all equity
- having regard to the distribution rate of the comparators from the same industry as the BEE, which suggests an estimate of 1 based on Lally's analysis
- ensuring consistency between parameters given we have used an overall value of imputation credits of 0.5 and a utilisation value of 0.6.

Our previous approach was to place primary weight on the ATO tax statistics for estimating the distribution rate. However, based on evidence and advice since the

[1518] More formally, the utilisation rate is the complex weighted average (by value and risk aversion) of individual investors' utilisation rates. In turn, these reflect each investor's expected ability to use imputation credits to reduce their tax (or get a refund).

2013 Guidelines, we have reconsidered the merits of the various indicators. We propose to place primary weight on the estimate by Lally based on the imputation credit distributions of the 20 largest ASX-listed firms from 2001 to 2017 for this draft instrument. This is because:

- the data for top 20 ASX firms is of high quality given it is audited and subject to scrutiny in financial markets[1519]
- the ATO in its note to us recommends the AER not use the tax statistics as the basis of a detailed macro analysis of Australia's imputation system[1520]
- the distribution rate for listed equity from the alternative approach (ATO FAB tax statistics) contains significant unresolved discrepancies and we now consider this data unsuitable for time series analysis[1521]

In submissions to the AER, some businesses propose a direct estimate of the value of imputation credits from the ATO tax statistics.[1522] This approach uses the estimated imputation credits redeemed and imputation credits created based on ATO tax statistics to give a direct estimate for gamma. We consider this approach is subject to a number of drawbacks. In particular, this approach implies a market wide distribution rate. For this draft instrument, we no longer consider a market wide distribution rate is appropriate for a BEE given that:

- Lally considers most of the regulated firms are either listed or owned by listed firms. Therefore, a distribution rate estimated from listed equity would be appropriate for the BEE.[1523]
- many unlisted firms are owned by individuals who have an incentive to reduce dividends to limit the amount of tax paid at higher marginal personal rates. Therefore, the dividend policy of these firms would be different from the BEE and a distribution rate from all equity will result in an overcompensation for the BEE.

A national gamma from the ATO tax statistics includes firms that make losses and disappear from the tax system without distributing their accumulated credits. The implied market wide distribution rate under this approach appears to have limited

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[1519] M. Lally, *Gamma and the ACT Decision*, May 2016, p. 26.

[1520] The ATO, *ATO note to the AER*, 9 May 2018

[1521] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 19.

[1522] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 12; NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 3; CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 74; Joint Energy Networks, *submission to the AER*, 4 May 2018, pp. 6-7; Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6; ATCO Gas, *Submission to the AER: Review of rate of return guideline-evidence sessions*, 4 May 2018; ENA; *Response to additional AER and Australian taxation Office materials- estimating the value of imputation credits*, 29 June 2018; N. Hathaway (Capital Research), Memorandum - *Response to three questions asked by the ENA,* 28 June 2018.

[1523] M. Lally, *The estimation of gamma,* November 2013, pp. 10-11; M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 19.

connection with the BEE. Rather, it will underestimate the efficient distribution rate of the BEE.

APA and APGA propose that the ATO tax statistics could give a reliable gamma estimate for the BEE once the market wide distribution rate is adjusted based on Wheatley's advice.[1524] We note the adjusted gamma estimate from the ATO tax statistics supports a value of imputation credits of at least 0.5. The detailed discussion on Wheatley's proposed approach is set out in Section A.4.3. Moreover, APGA and CCP16 propose that the AER should examine the distribution rate of the BEE by referring to the distribution rate of comparator companies.[1525] We note the distribution rate of the comparator firms from the same industry as the BEE also supports a higher distribution rate. Our detailed reasoning for this draft decision on the payout ratio including our detailed response to the businesses' submissions is set out in Appendix A.

11.3.2 Utilisation rate

In estimating the utilisation rate, we have considered the strengths and limitations of different sources of information. This includes:

- the equity ownership approach that uses the ABS data
- estimates based on ATO tax statistics
- estimates from implied market value studies

We consider the current evidence suggests a utilisation rate of approximately 0.6 is appropriate. In coming to a utilisation rate of 0.6, we have updated the data to the latest releases and we place:

- significant reliance upon the equity ownership approach, which suggests a range for the estimate of 0.6 to 0.7 for all equity
- some reliance upon tax statistics, which suggests an estimate of 0.61 based on dividend data for all equity
- limited reliance upon implied market value studies, which suggest a range for the estimate of 0 to 0.5. In particular, the adjusted estimate from SFG's dividend drop off study suggests a utilisation rate of 0.4[1526]

[1524] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 116; APA, *Submission responding to discussion papers and expert evidence*, 4 May 2018, pp. 11-12; APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 18.

[1525] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 16; CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 131.

[1526] Since the 2013 Guidelines we have considered that implied market value studies support an estimate of the utilisation rate between 0 and 0.5. The SFG dividend drop off study is one common type of implied market value studies that was adopted by most businesses. The businesses previously proposed a utilisation of 0.35 from SFG's study. We consider implied market value studies, if they are to be used at all, need to be adjusted for the incorrect estimates of the post company pre-personal tax value of cash dividends which would expect to also result in an incorrect estimate of the value of imputation credits. Based on Handley and Lally's advice, we consider the

- We note our estimate of the utilisation rate in our recent determinations was based on the data for all equity and listed equity. However, for this draft instrument, we have primarily relied on a utilisation rate estimated from data on all equity. In coming to this decision, we have had regard to the experts' advice in the concurrent evidence session and also stakeholder submissions. We agree with Lally that the utilisation rate is a market wide parameter and therefore is appropriately estimated based on data for all equity. [1527]
- We no longer consider a utilisation rate based on listed equity would give an appropriate utilisation estimate for the BEE, although we note that the current estimate of Australian ownership of listed equity is 58 per cent and combining this with a distribution rate of 88 per cent would still support a value for gamma of 0.5.

Another key issue raised by the stakeholders and the experts on the utilisation rate is that the Officer model assumes the equity markets are segmented.[1528] This implies a utilisation rate of 1 as it assumes all the assets in the equity markets are owned by domestic investors and there is no foreign investment. However, we consider the assumption of no foreign investment and no foreign investors would not reflect the empirical reality (of foreign investment in the Australian domestic market). In light of this we consider a more appropriate way for estimating the utilisation rate is to recognize the existence of foreign investors and therefore we interpret the utilisation rate as a weighted average over the utilisation rates of all investors in the Australian market.

The ENA submitted that an estimated distribution rate from the top 20 ASX firms suffers from the same issues as identified with ATO Franking account balance data.[1529] We do not agree with this submission. First, the top 20 ASX firms used to estimate the distribution rate are stable through time and therefore this analysis does not suffer the material entry and exit problems inherent in the use of aggregate ATO FAB data. For example, in the ATO FAB data set some firms will disappear over time due to liquidation causing leakage. Second, the data used for analysis of the distribution rate of the top 20 ASX firms is audited financial data and therefore is expected to be more reliable than the ATO FAB data which is based informational data on tax filings.

Our detailed reasoning for this draft instrument on the utilisation rate is set out in Appendix A.

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estimate from SFG's dividend drop off study should be interpreted as an estimate of around 0.4. Our detailed discussion on implied market value studies is set out in the attachment 4 to our determination for ElectraNet. The AER, *Draft decision for ElectraNet transmission determination 2018 to 2023, Attachment 4- Value of imputation credits*, October 2017

[1527] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 95.

[1528] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, pp. 106-108; CRG, *Submission to the AER on its Rate of Return Guideline Review*, May 2018, p. 60.

[1529] ENA; *Response to additional AER and Australian taxation Office materials- estimating the value of imputation credits*, 29 June 2018

A Value of imputation credits: detailed analysis

In this appendix, we set out further material for our draft decision on the value of imputation credits. We respond in detail to the issues discussed in the concurrent evidence session and also issues raised in stakeholder submissions. In this draft instrument, we have adopted a value of imputation credits of 0.5 having considered all the material before us. This appendix is structured under the following headings:

- rule requirements
- recent litigation on the value of imputation credits
- issues discussed in the concurrent evidence session and businesses' submissions
- reasons for approach

A.1 Rule requirements

Unlike many other aspects of the NER/NGR, there is no specific objective we must achieve for the value of imputation credits and no specific factors we must take into account in estimating it. The allowed rate of return objective does not specifically apply to the value of imputation credits. However, the rate of return must be determined on a nominal vanilla basis that is consistent with our estimate of the value of imputation credits.[1530]

In this context, the conceptual rate of return framework developed by Officer in a 1994 paper informs our approach to interpreting and estimating the value of imputation credits.[1531] This is because:

- The NER/NGR's cost of corporate income tax formula (shown above) mirrors Officer's framework for the treatment of imputation credits, including through the use of the parameter denoted by the Greek letter 'gamma'.[1532]
- We have received expert advice that Officer's definition of the nominal vanilla rate of return provides the basis for the rate of return framework in the NER/NGR.[1533] Previous statements by the consultant for the majority of the service providers', Gray, and their industry association appear to support this consideration:
    - During the AEMC's 2012 rule change process, Gray advised the AEMC that '…there are a number of different WACC formulas that can all be identified

[1530] NER, cll. 6.5.2(d)(2), 6A.6.2(d)(2); NGR, r. 87(4)(b).

[1531] R. Officer, 'The cost of capital of a company under an imputation system', *Accounting and finance*, vol. 34(1), May 1994, pp. 1–17.

[1532] R. Officer, 'The cost of capital of a company under an imputation system', *Accounting and finance*, vol. 34(1), May 1994, equation 2.

[1533] J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, pp. 7–8.

as post-tax nominal definitions of WACC. Officer (1994), in the paper that forms the basis for the regulatory rate of return framework, sets out four such definitions…'[1534]

- During the development of the 2013 Guidelines, the Energy Networks Association (ENA) submitted '[t]he fundamental economic framework in relation to dividend imputation was set out by Officer (1994)…'[1535]

The NER/NGR require that we determine the rate of return on a nominal vanilla basis that is consistent with our estimate of the value of imputation credits.[1536] The Officer framework provides a means for doing this. It provides a consistent framework for determining the rate of return for a business, which takes into account the value that investors expect to receive from utilising imputation credits.[1537] An important implication of this is that the value of imputation credits (or gamma) is not a standalone concept or parameter. It is part of a broader framework, and should be interpreted and estimated accordingly.

Consistent with the expert advice we have received, we consider that the Officer framework provides the basis for the rate of return framework in the NER/NGR. We therefore also consider that estimating the value of imputation credits consistent with the Officer framework will best promote the NEO/NGO [1538] and other requirements of the NER/NGR.

To this end, we have had regard to the differing expert opinions on the proper interpretation of the value of imputation credits parameter in the Officer framework. As discussed in section A.4.2, we accept Handley's expert advice on the Officer framework. An important aspect of this advice is that the framework is on a 'before-personal-tax and before-personal-costs' basis.[1539] That is, 'the per dollar value of an imputation credit γ gamma should be measured prior to any personal tax on the credit and prior to any personal costs associated with the receipt of the credit'.[1540] A detailed consideration of Handley's advice on the Officer framework is set out in section A.7.3 of attachment 4 to our determination for ElectraNet.[1541]

By determining a value of imputation credits in a manner consistent with the Officer framework, we consider that we are making our decision in a manner that will or is

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[1534] SFG, *Response to submissions on rule change proposals, Report for the AEMC*, 5 November 2012, para. 2.

[1535] ENA, *Response to the Draft Rate of Return Guideline of the Australian Energy Regulator*, 11 October 2013, p. 49.

[1536] NER, cll. 6.5.2, 6A.6.2; NGR, r. 87.

[1537] For a detailed discussion of the Officer framework, see: J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, pp. 7–12.

[1538] NEL, s. 16(1)(a); NGL, s. 28(1)(a).

[1539] Although the term 'personal' is used, we note that classes of investors other than individual persons can value imputation credits (for example, superannuation funds and charities). Therefore, an alternative characterisation might be 'before-investor-tax' and 'before-investor-costs'.

[1540] J. Handley, *Report prepared for the Australian Energy Regulator: Further advice on the value of imputation credits*, 16 April 2015, p. 5.

[1541] The AER, *Draft decision: ElectraNet transmission determination 2018 to 2013, Attachment4- Value of imputation credits*, October 2017,

likely to contribute to the achievement of the NEO/NGO.[1542] In taking this approach we have applied a 'utilisation' approach to estimating the value of imputation credits. We consider a 'utilisation' approach to the value of imputation credits consistent with the rate of return framework in the NER/NGR.

Further, when exercising our discretion in making the relevant parts of a decision, we must take into account the revenue and pricing principles (RPP).[1543] The RPP provide, amongst other things, that:[1544]

- a service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs providing network services and complying with regulatory obligations
- a service provider should be provided with effective incentives in order to promote economic efficiency with respect to the network services it provides, and
- a price, charge or tariff for the provision of a regulated service should allow for a return commensurate with the regulatory and commercial risks involved in providing the network services.

Therefore, the value of imputation credits we adopt must ultimately promote the achievement of the NEO/NGO (via its application in the estimated cost of corporate income tax building block) and must take into account the RPP.

With reference to the language of the RPP, this requires the exercise of our discretion in determining a tax building block (including the exercise of our discretion in determining the adjustment for the value of imputation credits) that is:

- not too low, in that it contributes to providing a reasonable opportunity to recover at least efficient corporate tax costs
- not too high, in that it contributes to a return that is not excessive and is commensurate with the relevant risks.

We consider that finding the right balance is best served by having regard to the merits of the full range of relevant evidence. We explain our consideration of, and reliance upon, the range of relevant evidence in this draft instrument. We determine a value of imputation credits that in combination with our allowed return on equity that is estimated consistently, we are satisfied achieves a balance between the opportunities for service providers to recover at least efficient costs but that is commensurate with relevant risks.

[1542] NEL, s. 16(1)(a); NGL, s. 28(1)(a).
[1543] NEL, s. 16(2)(a)(i); NGL, s. 28(2)(a)(i).
[1544] NEL, ss. 7A(2)–(7); NGL, ss. 24(2)–(7).

A.2 Recent litigation on the value of imputation credits

The issue that has been in dispute over the past few years is the interpretation of "value" in the statutory context. It was heard by the Ausgrid Tribunal and the decision was handed down in February 2016.[1545] The Ausgrid Tribunal considered the AER had erred in adopting a conceptual approach to gamma that defines it as the value of imputation credits that are available for redemption.[1546] The Ausgrid Tribunal found this due to us placing most reliance on the equity ownership approach and effectively defining the utilisation value as the proportion of distributed imputation credits that are available for redemption.[1547] The Ausgrid Tribunal considered that such an approach:[1548]

> 'is inconsistent with the concept of gamma in the Officer Framework for the WACC which underlies the rules and the objective of ensuring a market rate of return on equity by making an adjustment to the revenue allowance for taxation to take account for imputation credits.'

We sought judicial review of the Ausgrid Tribunal's decision in the Full Federal Court and our applications were heard in October 2016. The decision of the Full Federal Court was handed down on 24 May 2017.[1549] The Court found it was not an error of construction for the AER to focus on utilisation rather than on implied market value.[1550] It accepted the AER's submission that the Rules require consistency in the way the relevant building blocks interact, that is, after company tax but before personal tax and personal costs.[1551] The Full Federal Court found the Tribunal erred in concluding that the value of imputation credits is (only) the value claimed or utilised as demonstrated by the behaviour of the shareholder recipients of the imputation credits.[1552] The Full

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1545 Australian Competition Tribunal, *Application by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, 26 February 2016.

1546 Australian Competition Tribunal, *Application by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, 26 February 2016, para. 1100; United Energy, *Submission on AER preliminary determination - Submission on gamma*, 26 April 2016; CitiPower/Powercor, *Submission on implications of recent Australian Competition Tribunal Decision*, 18 April 2016; ActewAGL, *Implication of recent Tribunal decisions for final decision and updates to the allowed rate of return and forecast inflation estimate*, 12 May 2016.

1547 Australian Competition Tribunal, *Application by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, February 2016, para. 1100.

1548 United Energy, *Submission on AER preliminary determination - Submission on gamma*, 26 April 2016; CitiPower/Powercor, *Submission on implications of recent Australian Competition Tribunal Decision*, 18 April 2016; ActewAGL, *Implication of recent Tribunal decisions for final decision and updates to the allowed rate of return and forecast inflation estimate*, 12 May 2016; Australian Competition Tribunal, *Application by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, 26 February 2016, para. 1100.

1549 Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017.

1550 Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, para. 756.

1551 Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, para. 752.

1552 Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, para. 754.

Federal Courts decision on this point is consistent with the approach we have taken in all regulatory decisions released since November 2014.

The Australian Competition Tribunal's decision for ActewAGL Distribution in October 2017 further upheld the AER's decision on the value of imputation credits.[1553] The Tribunal considered that it was open to the AER to consider both listed and all equity consistent with matching the distribution and utilisation rate estimates for each of those categories.[1554] It accepted that the AER was entitled to come to the view that the Rules require that the value of imputation credits be measured before investor taxes and costs.[1555] It accepted the expert advice that "before investor taxes and costs" means the value of imputation credits is to be estimated before allowing for the impact of those taxes and costs and that market studies, in particular, the dividend drop-off study, which takes into account of the investor's costs do not meet that requirement.[1556] The Tribunal further came to the following conclusions:[1557]

- The AER made no relevant error in its choice of the period over which it considered equity ownership data. That approach was open to it, and as explained by it, reasonable.
- The AER made no relevant error in choosing the estimate that it did from within the equity ownership range. Its manner of choice, as described in its Final Decisions, was clearly open to it.
- The reliability of the tax statistics is unclear. The AER did not err in giving some reduced weight to tax statistics; nor did it err in the manner in which it took them into account, as set out in detail in its Final Decisions.

The Full Federal Court's January 2018 decision for SAPN also affirmed the AER's interpretation of the value of imputation credits.[1558] We consider this issue has been largely settled following the two Full Federal Court's decisions. The Full Federal Court found that it is not an error of construction for the AER to focus on utilisation rather than on implied market value.[1559]

[1553] Australian Competition Tribunal, *Tribunal decision in ActewAGL – re Application by ActewAGL[2017] ACompT 2*, October 2017

[1554] Australian Competition Tribunal, *Tribunal decision in ActewAGL – re Application by ActewAGL[2017] ACompT 2*, October 2017, para. 299.

[1555] Australian Competition Tribunal, *Tribunal decision in ActewAGL – re Application by ActewAGL[2017] ACompT 2*, October 2017, para. 337.

[1556] Australian Competition Tribunal, *Tribunal decision in ActewAGL – re Application by ActewAGL[2017] ACompT 2*, October 2017, para. 338.

[1557] Australian Competition Tribunal, *Tribunal decision in ActewAGL – re Application by ActewAGL[2017] ACompT 2*, October 2017, para. 346, 347, 348,351.

[1558] Federal Court of Australia, *SA Power Networks v Australian Competition Tribunal (No 2) [2018] FCAFC 3*, Jan 2018, para. 56.

[1559] Federal Court of Australia, *SA Power Networks v Australian Competition Tribunal (No 2) [2018] FCAFC 3*, Jan 2018, para. 56; Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, para. 756.

A.3 Issues from the concurrent evidence session and submissions

We released an issues paper in October 2017 outlining key areas of the Guideline review process.[1560] In March 2018, we released a discussion paper on imputation credits to provide background on the matters to be discussed at the concurrent evidence session and questions to frame that discussion.[1561]

At the concurrent evidence session, the experts retained by relevant stakeholders expressed their views on various issues in estimating the value of imputation credits. The key issues discussed at the concurrent evidence session included:

- the AER's conceptual approach in estimating the value of imputation credits
- the definition of a benchmark entity
- the appropriate comparator companies
- the strengths and weaknesses of each source of evidence in estimating the gamma parameters

A number of general agreements were reached over the following issues:

For the purpose of estimating the distribution rate, a benchmark efficient entity should be defined as a corporate entity who pays tax at the full Australian statutory rate and does not have any foreign operations [1562]

The Officer model assumes the national equity markets are segmented. In a segmented market, all the equities are held by Australian investors and there is no foreign investment. Therefore, the appropriate estimate of the utilisation rate implied by the Officer model would be 1.[1563]

We have considered the issues raised by the experts in the concurrent evidence session and also the issues proposed by the stakeholders in their submissions in coming to our draft decision on the value of imputation credits. Table 48 sets out the key issues raised by stakeholders and the experts. We also provide a summary of our response. Our detailed response to the issues raised by the experts and stakeholders is covered in sections below.

[1560] The AER, *Issues paper- Review of the rate of return guidelines,* October 2017

[1561] The AER, *Gamma discussion paper*, March 2018

[1562] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 72.

[1563] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 69.

Table 48 issues on the value of imputation credits

Key point	Submission	Stakeholder	AER response
Overall approach	Limiting the review to the updating of earlier empirical analysis would not be in accordance with the Rule. The AER should re-examine the implementation of its approach to estimating its 'cash flow' interpretation of gamma.	APA[1564], ENA[1565], Spark Infrastructure[1566]	We have re-examined our conceptual framework of estimating the value of imputation credits, as well as the approach we have adopted to estimate the parameter in this draft instrument. We consider our current 'utilisation' approach is consistent with the Rules and will contributing to the achievement of the NEO and NGO.
	The value of imputation credits should be interpreted as the market value. Theta should be far below the AER's redemption rate.	Gray[1567], Wheatley[1568], Sadeh[1569]	We consider our interpretation of the value of the imputation credits is consistent with the Officer framework that the parameters need to be estimated on a pre-personal tax and cost basis. We do not consider the market value interpretation of the parameter is consistent with the framework.
	The AER's current 'utilisation' approach is consistent with the Full Federal Court's decision that is before investors' taxes and costs. The issue is largely settled.	Lally[1570], Partington[1571], Ergon Energy and Energex[1572], Public Interest Advocacy Centre[1573], EUAA[1574]	We agree.
	A gamma of 0.5 will result in an effective adjusted tax allowance of 15 per cent which is closer to the reality of the actual taxation	CCP16[1575]	Based on the most recently updated empirical evidence, we consider a value of imputation credits of 0.5 would result in an

[1564] APA, *APA submission responding to AER issues paper,* 12 December 2017, p. 12.
[1565] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 3.
[1566] Spark Infrastructure, *Response to issues paper on the review of the Rate of Return Guideline*, December 2017, p. 10.
[1567] EPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 68.
[1568] EPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 68.
[1569] EPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 68.
[1570] EPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 68.
[1571] EPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 68.
[1572] Ergon Energy and Energex, *Ergon Energy and Energex submission on AER Issues Paper*, 12 December 2017, p. 7.
[1573] PIAC, *PICA letter to the AER*, December 2017, p. 2.
[1574] EUAA, *EUAA submission to AER Rate of Return Review issues paper*, December 2017, pp. 9-10
[1575] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 132.

	paid by the networks but will still overcompensate the firms given the imputation benefits.		overall return that is (at least) sufficient to compensate the investors of the BEE.
	The actual tax paid by networks is far under the amount of tax assumed by the AER and has reservations about the assessment of utilisation and distribution rates that are used. A value of imputation credits of 0.4 is much too conservative and needs to be increased.	CCP16[1576], Major Energy Users[1577], AIET[1578]	We have re-examined our approach for estimating the value of imputation credits and updated the empirical evidence. Having considered all the information before us, we propose to increase the estimate from 0.4 to 0.5 for this draft instrument.
	The AER should consider the composition of the empirical evidence used to update the value of imputation credits as well as that of the benchmark efficient entity. This includes consideration of the suitability of adopting the distribution rate of firms in the ASX 20 or the market as a whole as a proxy for the benchmark efficient entity given that various business models exist among listed businesses. There should be consistency across the empirical evidence used to estimate the rate of return. The AER should examine the strengths and weaknesses of each empirical evidence.	ATCO Gas Australia[1579], Cheung Kong Infrastructure[1580]	We have considered the composition of the empirical evidence used to update the value of imputation credits in this draft instrument. We have considered the relative strength and weaknesses of each piece of empirical evidence in estimating the value of imputation credits. We also define the benchmark efficient entity. However, we consider it is difficult to identify a set of companies that are most consistent with the BEE. We consider our approach for estimating the value of imputation credits for the benchmark efficient entity is consistent with the approach we have taken in estimating the other parameters in the rate of return.
	The AER should set out clearly how the updated empirical analysis has been used and distilled into a point estimate	Cheung Kong Infrastructure[1581], Energy Networks Association[1582], AusNet Services[1583], Spark Infrastructure[1584]	We have transparently set out how we have assessed the empirical evidence for estimating the parameters of the value of imputation credits and how we have chosen the point estimate for the vale of imputation credits.

[1576] CCP (subpanel 16), *CCP Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, p. 113.

[1577] Major Energy Users, *Submission by the MEU to the review of the rate of return guideline*, 18 December 2017, p. 17.

[1578] Agriculture industries energy taskforce, *submission to AER discussion paper profitability measures for regulated gas and electricity*, December 2017, p. 12.

[1579] ATCO Gas Australia, *Response to Revie of Rate of Return Guideline – Issues Paper*, 12 December 2017, p. 9.

[1580] Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, p. 6.

[1581] Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6

[1582] ENA, *Response to AER Issues Paper*, 12 December 2017, pp. 35-38

[1583] AusNet Services, *Submission to AER issues paper*, December 2017

[1584] Spark Infrastructure, *Response to issues paper on the review of the Rate of Return Guideline*, December 2017, p. 10.

	Any change in the approach or parameter estimate should only occur if there is robust and reliable evidence that the parameter estimate is no longer the best estimate and will not give rise to rate of return or gamma that contributes to the achievement of the NEO/NGO to the greatest degree.	Joint Energy Networks[1585]	We have given our reasoning for the departures from some specific aspects of the 2013 Guidelines in this draft decision. In coming to the draft decision on the value of imputation credits, we have taken all the available information into account and we consider our current estimate for gamma is most likely to contribute to the achievement of the NEO/NGO.
	Theta is an economy wide measure and the distribution rate is firm specific and based on dividend distribution practice identified with the BEE.	APGA[1586]	We agree that theta (or the utilisation rate) is market wide parameter while the distribution rate is firm specific and should be determined based on the expected practice of the BEE.
	The AER's current approach values franking credits retained at zero, which is likely to downward bias the estimate for the value of imputation credits.	Partington[1587]	We agree. However, we consider assuming retained imputation credits have no value might be a reasonable assumption to the extent that imputation distribution rates are expected to remain constant overtime.
Benchmark efficient entity	The BEE pays at the statutory corporate tax rate and operates in Australia.	Agreed by the experts in the concurrent evidence session[1588]	We define a benchmark efficient entity to be taken as a domestic entity that operates within Australia and have 'a similar degree of risk' as that which applies to the particular service provider in providing its 'regulated' services. We note that as the NER and NGR are drafted, the benchmark firm pays tax at the relevant Australian corporate tax rate.
The distribution rate	Most of Lally's top 20 listed firms are banks or multinationals. The distribution rate estimate from Lally's 20 largest listed firms	ENA[1589], NSG[1590], APGA[1591], Cheung Kong Infrastructure[1592],	Given that the ATO tax statistics contains significant unresolved discrepancies, we depart from 2013 Guidelines and consider the data

[1585] Joint Energy Networks, *Submission on Rate of Return Guideline Review*, 4 May 2018, p. 6.
[1586] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 15.
[1587] EPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 74.
[1588] EPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 71.
[1589] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 11.
[1590] NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 18
[1591] APGA, *Submission to the Issues Paper*, 12 December 2017, p. 10
[1592] Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6

	does not give an accurate reflection for the BEE.	Sadeh[1593], Wheatley[1594]	from the financial statements for the top 20 listed firms gives a distribution rate that is likely to best reflect the expected distribution rate of a BEE based on Lally's advice.
	The AER should be explicit in how it is representing the BEE when it determines the distribution rate estimate.	CCP16[1595], APGA[1596]	We have had regard to the estimates of the distribution rate from varies empirical evidence. Our estimate of the distribution rate of 0.83 is based on our view an estimate of 0.88 is appropriate and then using a lower estimate of 0.83 that is internally consistent with a gamma value of 0.5 and utilisation rate of 0.6.. We expect our current approach for estimating the distribution rate would give a best estimate for the parameter.
	The service providers would have a lower distribution rate than the average entity because they need retain large proportion of profit to reinvest it into the businesses.	Sadeh[1597]	The evidence before us does not support this. The average real growth rate in RAB between 2013-14 and 2016-17 was approximately 1.9 per cent per annum. Moreover, the service providers are compensated for the depreciation on their regulated asset base through the allowed revenue they get from the regulator. We consider the BEE can also retain funds while distributing credits through the use of dividend reinvestment programs, or raise new equity capital in other ways.
	The distribution rate could be estimated from the equation below: $1 - \frac{I - D}{RAB * WACC}$.	CRG[1598]	This approach is based on the assumption that apart from the revenue compensation it gets from the regulator for asset depreciation, a BEE could only fund its investment through retained earnings. However, firms have access to different sources of finance to fund their investment.
	Lally's top 20 firms have material foreign income and it would not	Gray[1599], Cheung Kong	Lally considers the effect of including the firms with foreign

[1593] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 77.

[1594] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 78.

[1595] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 10.

[1596] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 15.

[1597] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 100.

[1598] CRG, *Submission to the AER on its Rate of Return Guideline Review*, May 2018, p. 59.

[1599] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 76.

	accord with the definition of the BEE. An estimate based on Lally's analysis will overestimate the distribution rate.	Infrastructure[1600], ENA[1601], APGA[1602]	operations is to underestimate the distribution rate for the benchmark firm.[1603] We consider the evidence supports that the benchmark firm with no foreign income should be able to distribute at least 88 per cent of its imputation credits.
	Lally's approach for estimating the distribution rate from financial statements is subject to various difficulties requiring adjustment.	Gray[1604], ENA[1605]	We consider the data from the financial statements is audited and should produce a significantly more reliable estimate for the distribution rate compared to the ATO tax data.
	The distribution rate should be based on all equity and the estimate for the listed equity has to be the upper bound.	Sadeh[1606]	We consider the distribution rate for the BEE should be estimated from listed equity given Lally's advice that the distribution rate is a firm-specific rather than a market-wide parameter. We agree that listed equity is likely to better reflect the distribution rate for the benchmark efficient entity. We do not consider the estimate for the listed equity is an upper bound.
	The AER should identify the comparator companies that are most consistent with the BEE in estimating the distribution rate.	APGA[1607], CCP16[1608]	In practice, it is difficult to construct a data set for such companies.
	The AER should look at relevant data on taxation and imputation policies of the relevant businesses.	CCP16[1609]	Lally examined the distribution rate of five companies from the same industry as the BEE and found a distribution of 1 for those firms for which the data is available.[1610] We have also examined the distribution rate of the five companies from their financial reports. Our number is close to Lally's estimates.
	The distribution rate could be	CCP16[1611]	A key issue with using the industry

[1600] Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6

[1601] ENA, *Response to AER Issues Paper*, 12 December 2017, p. 37.

[1602] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 16.

[1603] M. Lally, *Issues in the estimation of gamma*, April 2017, pp. 9-12.

[1604] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 77.

[1605] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 11.

[1606] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 100.

[1607] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 16.

[1608] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 131.

[1609] CCP (subpanel 16), *CCP Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, pp. 9-10

[1610] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 20.

[1611] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 131.

	calculated using actual behaviour of the individual network companies or a relevant group of companies that fit within the AER's definition of the BEE.		data is the set of firms is not large.
	The distribution rate for the BEE could be implied from the dividend payout rates of some suitable comparators.	Gray[1612]	We do not consider the imputation credits distribution rate could be implied from the dividend payout rate. They are two fundamentally different concepts.
ATO tax statistics	The AER should place limited weight on the estimates of the parameters from the ATO tax statistics.	CCP16[1613]	We agree.
	The AER should continue to seek refinement of the tax return data given it should be useful for estimating the payout rate and the utilisation rate.	CCP16[1614]	We have attempted to refine the ATO tax data. Consistent with Hathaway's findings we also find that there is a significant discrepancy associated with the tracking of imputation credits in the ATO data.
	The ATO tax statistics gives a direct estimate for the value of imputation credits.	ENA[1615], NSG[1616], CEPA[1617], Cheung Kong Infrastructure[1618], Gray[1619], Joint Energy Networks[1620], ATCO[1621]	We consider this approach for estimating gamma involves a number of potential issues and would not give a reliable estimate for the value of imputation credits for the benchmark efficient entity.
	The ATO tax statistics gives an estimate of an upper-bound for a 'utilisation' gamma.	ATCO[1622]	We do not consider the ATO tax statistics would give either a reliable estimate or an upper bound estimate for gamma given it is an estimate and given the reliability concerns with the ATO data.

[1612] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, pp. 112-114.

[1613] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 10.

[1614] CCP (subpanel 16), *CCP Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, pp. 9-10
CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 133.

[1615] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 12.
ENA, *Submission on rate of return issues paper, attachment C- Letter-Tax statistics*, 12 December 2017

[1616] NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 3.

[1617] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 74

[1618] Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6

[1619] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 74.

[1620] Joint Energy Networks, *Submission on Rate of Return Guideline Review*, 4 May 2018, pp. 6-7.

[1621] ACTO Gas, *Submission on rate of return guideline review*, 4 May 2018

[1622] ATCO Gas, *Submission on rate of return guideline review*, 4 May 2018

	The ATO tax statistics could give a reliable gamma estimate for the BEE once the market wide distribution rate is adjusted.	Wheatley[1623], APA[1624], APGA[1625]	The adjusted estimate of value of imputation credits from the ATO tax statistics indicates a value of slightly over 0.5. This is consistent with the value of imputation credits in the draft instrument.
	The distribution rate for the BEE could be inferred from the service providers' actual imputation credits distribution rate	Lally[1626]	We consider this approach may promote the businesses to adopt a distribution policy that would maximise their regulatory revenue. This may not necessarily be in the long term interest of the consumers, or consistent with achieving the NEO/NGO.
The utilisation rate	The model assumes the national equity markets are segmented. This implies a utilisation rate of 1as all the assets in the equity markets are owned by domestic investors and there is no foreign investment.	Lally, Gray[1627], CRG[1628]	We agree. However, we consider the assumption of no foreign investment and no foreign investors does not reflect the empirical reality.
	If one assumes that the presence of foreign investors must be reflected in the estimate of the utilisation rate, the ABS equity ownership data provides the natural estimate of the parameter.	Lally[1629]	We agree.
	The utilisation rate of the BEE should be estimated from the ABS data for all equity	CCP16[1630]	We agree.
	The AER should examine the composition of the shareholder base of the BEE in estimating the utilisation rate	ENA[1631]	We have considered the shareholder base of the BEE. The Officer CAPM assumes all the assets in the equity market are owned by domestic investors. This implies the BEE is owned by domestic investors and hence it suggests a utilisation of 1. However, we consider a utilisation rate of 1 would not reflect the reality.

[1623] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 116.

[1624] APA, *Submission responding to discussion papers and expert evidence*, 4 May 2018, pp. 11-12.

[1625] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 18.

[1626] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 95.

[1627] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, pp. 106-108.

[1628] CRG, *Submission to the AER on its Rate of Return Guideline Review*, May 2018, p. 60.

[1629] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 76.

[1630] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 132.

[1631] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 89.

	The utilisation rate estimate from the equity ownership approach does not take into account investors who receive imputation credits but do not redeem them.	ENA[1632], Cheung Kong Infrastructure[1633], Wheatley[1634]	Such matters are only significant to the extent that such non redemptions are significant and there is no evidence showing that. We also note we have used a utilisation rate at the bottom of our suggested range from ABS data for all equity and below the current point estimate from this data.
The equity ownership approach	The equity ownership estimates of the utilization rate based on the ABS data require filtering and adjustment, and may be subject to sampling error. The AER should seek further clarity to the issue on ABS data.	ENA1635, Cheung Kong Infrastructure[1636], APGA[1637]	We consider such data issues would also apply to the alternative approaches. For example the estimates based on ATO data also require filtering that may be subject to sampling error..
	The recent data released by the ABS raises more questions about the reliability of the equity ownership estimates than were apparent at the time of the 2013 Guidelines.	ENA[1638]	The updated ABS data is considered to be more reliable than the data released earlier by the ABS, given that the purpose for the ABS data revision is to improve the data quality. As a result, we consider the updated data would produce a more reliable estimate of the utilisation rate than the utilisation rate estimated from the earlier ABS release.
	The revision to the ABS data is based on a 'backcasting' exercise that could be less reliable than the estimates that it made at the time the historical data was collected	ENA[1639]	The data from the most recent December 2017 release which is not based on 'backcasting' exercise suggests a utilisation rate of 0.65 for all equity. This is within the range of 0.6 and 0.7 of the utilisation rate.
	The model assumes the equity market is either complete segregation or complete integration, the equity ownership approach in estimating the utilisation rate is not consistent	Gray[1640], NSG[1641], APGA[1642], Partington[1643]	We consider the utilisation rate consistent with the Officer model is 1. However, we do not consider this reflects the empirical reality.

[1632] ENA, *Response to AER Issues Paper*, 12 December 2017, p. 36.
[1633] Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6
[1634] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 76.
[1635] ENA, *Response to AER Issues Paper*, 12 December 2017, p. 37.
[1636] Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6
[1637] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 16
[1638] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 91, p. 11.
[1639] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 91.
[1640] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 108.
[1641] NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 18.
[1642] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 15.
[1643] EPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 69.

	with any equilibrium models		
	The AER should have some reliance on the equity ownership data while recognising it is an upper bounds to the extent that it does not factor in the 45-day rule. The AER should quantify the impact of this rule.	Gray[1644], APGA[1645], NSG[1646]	We consider the 45 day rule does not have a material impact on the utilisation rate. This is supported by Lally.1647 We have not been presented with any data that would suggest the 45 day rule is having any impact on the utilisation of imputation credits.
	The ABS data gives an appropriate reference point for estimating the market wide parameter of the utilisation of imputation credits.	CCP16[1648]	We agree.
	The value of imputation credits should be interpreted as the market value and the utilisation rate should be estimated from market value studies.	NSG[1649]	In light of the Full Federal Court's decision, we remain of the view our interpretation of the value of the imputation credits is open to us and consistent with the Officer framework under which the parameters need to be estimated on a pre-personal tax and cost basis. The estimates from the market value studies, which is on a post personal tax and personal basis basis, is not consistent with the allowed rate of return parameters and the post (corporate) tax framework in the NER/NGR.
Implied market value estimates	The role for the market based studies of the 'value of imputation credits' in the context of the building block regulatory regime is limited.	CCP16[1650]	We agree.

[1644] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 115.

[1645] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, pp. 16-17

[1646] NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 18.

[1647] M. Lally, *Gamma and the ACT Decision*, May 2016, pp. 20-21.

[1648] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 131.

[1649] NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 18.

[1650] CCP (subpanel 16), *CCP Submission to the AER on its Rate of Return Guideline Issues Paper*, December 2017, p. 113.
CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 130.

A.4 Reasons for approach

In this section, we discuss the reasons for reaching the draft instrument value of 0.5. In particular, we provide detailed analysis to the issues raised in the stakeholder submissions and also the issues raised by the experts in the concurrent evidence session. During the development of the Guideline, we also commissioned expert advice on the value of imputation credits from Dr Martin Lally.

A.4.1 The building block framework

Under the NER/NGR, we employ a building block framework to estimate revenue for service providers. The building block framework sets out how to estimate the various components (that is, 'building blocks') that make up a total revenue allowance.[1651] The function of this building block revenue estimate is to determine the revenue that a service provider requires to:

- fund its operating expenses.
- achieve adequate returns to raise debt and equity in order to finance its capital investments. This is made up of a rate of return on capital to compensate investors for the risks of investment. It also includes a return of capital (depreciation), which gradually returns the initial principal of the investment, and subsequent investments, back to investors.
- pay its tax liability.
- reflect any revenue increments or decrements from incentive mechanisms in the design of the regulatory regime.

Importantly, the building block framework is intended to compensate the service provider (and its investors) only for costs incurred by the service provider and not by its investors; that is, the framework is on a post-company before-personal-tax and before-personal-costs basis. Handley described this consideration as follows:[1652]

> The post-tax basis of the regulatory framework can be more fully described as an after-company-before-personal-tax framework. In other words, cash flows and returns are to be measured after company taxes but before personal taxes. By definition, this means that allowed revenues should include compensation for corporate taxes incurred by the regulated firm but not for personal taxes incurred by the firm's shareholders. Similarly, allowed revenues should include compensation for prudent, efficient costs incurred by the regulated firm but not for costs (including personal transactions costs) incurred at the shareholder level. Note, this does not mean that personal taxes and costs are being ignored or assumed not to exist – rather there is no need to explicitly include them in the modelling framework.

[1651] NER, cll. 6.4.3, 6A.5.4; NGR, r. 76.

[1652] J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, pp. 4–5 and footnote 2.

…

> The regulatory WACC framework is an after-company-before-personal-tax framework which requires explicit modelling of cash flows and returns after allowing for company tax but avoids most of the complications associated with having to model personal taxes - one complication which remains of course, is gamma. If one wanted to explicitly model personal taxes then an after-company-after-personal-tax WACC framework could be used instead.

In particular, Handley advised that the Officer framework provides the basis for the building block framework in the NER/NGR, and that the before-personal-tax and before-personal-costs interpretation is consistent with Officer.

There is no consensus among experts or regulators on the value of imputation credits or the techniques to use to estimate it. In the second current evidence session, the experts expressed their views on the issues relating to gamma estimation but without reaching a precise view on how they should be resolved. In particular, the experts retained by the businesses, Gray and Sadeh, expressed their different views on the AER's interpretation of the value of imputation credits proceeding on the basis of a 'utilisation' approach, but failed to provide any other "materially preferable" method to estimating gamma.1653 Some stakeholders in their submissions propose that the AER should examine its current interpretation of gamma in the review of the rate of return guideline.1654

For this draft instrument, we have re-examined the conceptual task of estimating the value of imputation credits. In response to a number of service providers' and experts' view that we prefer our conceptual valuation relative to a market mechanism derived value, and their concerns around our definition of gamma, we note:

- There is no market for imputation credits and therefore there is no directly observable market price.[1655]
- The value of imputation credits as estimated through a dividend drop off study:
    - is not a post company tax value before personal taxes and personal transaction costs, although Lally in his recent report to the AER argues this approach could give an estimate that is consistent with the model as long as it is appropriately adjusted[1656]

[1653] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 68.

[1654] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 3; APA, *APA submission responding to AER issues paper,* 12 December 2017, p. 12; Spark Infrastructure, *Response to issues paper on the review of the Rate of Return Guideline*, December 2017, p. 10.

[1655] We note that if there was a post-tax market for imputation credits they should trade for approximately their face value as this is the amount of post-tax cash flow from the government they entitle the claimant to receive from the government.

[1656] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 25.

- is not clearly measuring a value to long term investors supplying capital to the benchmark efficient entity (even when adjusted for differential tax impacts)
- is subject to significant uncertainty

- A number of limitations of these market value studies are discussed further in sections A.4.3
- Our definition of the utilisation value is consistent with Officer Framework underpinning the Rules that uses a post-tax Vanilla WACC, is consistent with the way we estimate the required return on equity, and is supported by Handley. Lally also considers our approach to imputation credits is consistent with the post-tax framework in the NER/NGR.[1657]
- The explicit recognition that this is a pre personal taxes and pre personal transaction costs value is simply explicit recognition of something implicit in the Officer Vanilla WACC framework. This framework determines the required return to the company (i.e. before personal taxes and personal transaction costs are incurred) consistent with the definition of the after-tax net cash flows set out in Officer.[1658]
- Our definition is consistent with the 'value' concept in the Rules given the Rules are requiring the AER to estimate a post-tax nominal Vanilla WACC consistent with Officer formula (12) in his 1994 paper, which as stated by Officer is one particular definition of "a company's after-tax cost of capital (WACC)" and "is determined by the definition used of after-tax operating income or really after-tax net cash flows".[1659] As these after-tax net cash flows are at the company level they are before personal taxes and personal transaction costs. This is supported by the advice of Handley and Lally.[1660]
- The Full Federal recently found:[1661]

> the expression "the value of imputation credits" is to be construed as a whole, in its context and having regard to the subject matter of the exercise. It would be an error to limit attention to the word "value" and give it a meaning in isolation.
>
> ….

[1657] M. Lally, *Gamma and the ACT Decision*, May 2016, pp. 11-12.

[1658] R. Officer, 'The cost of capital of a company under an imputation system', *Accounting and finance*, vol. 34(1), May 1994, p. 7.

[1659] R. Officer, 'The cost of capital of a company under an imputation system', *Accounting and finance*, vol. 34(1), May 1994, p. 6.

[1660] J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, pp. 4–5 and footnote 2; M. Lally, *Gamma and the ACT Decision*, May 2016, pp. 7, 11, 12.

[1661] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, p. 215 - 216.

> We accept the AER's submission that the context is the determination of a regulated return using a post-tax revenue model based on a nominal WACC. We accept the AER's submission that the Rules require consistency in the way the relevant building blocks interact, that is, a post-company tax and pre-personal tax and personal costs basis.
>
> ….
>
> it is not an error of construction for the AER to focus on utilisation rather than on implied market value.

Contrary to the Full Federal Court's finding, Ausgrid submitted a report from Frontier Economics that argues the value of imputation credits should be interpreted as the market value and the utilisation rate should be estimated from market value studies.[1662] We note the material on the value of imputation credits in the report submitted by Ausgrid is substantively similar to the Frontier report submitted by TransGrid in August 2017.[1663] Our response to the Frontier's report is set out in detail in attachment 4 of the AER's draft determination for TransGrid.[1664] The arguments in the report do not change our view on the conceptual framework for the estimation of the value of imputation credits.

We note that while our approach here to updating the estimates for theta (the utilisation rate) and the distribution rate is consistent with an incremental review, we did consider if departure from an incremental review was required in order to meet our legal requirements. We have determined it is not as we consider our current 'utilisation' approach is consistent with the Rules and will contributing to the achievement of the NEO and NGO.

A.4.2 The conceptual framework for the value of imputation credits

In this instrument, we view the value of imputation credits as the proportion of company tax returned to investors through the utilisation of imputation credits. Moreover, as noted above, it is the post-company pre-personal tax value of imputation credits to those investors that we seek to estimate. Our approach to interpreting and estimating the value of imputation credits is guided in the first instance by the conceptual framework developed by Officer.[1665] This is because:

[1662] Frontier Economics, *Estimation of certain aspects of the allowed rate of return*, April 2018, p. 182.

[1663] Frontier, *Estimating gamma within the regulatory context*, August 2017,

[1664] The AER, *Draft decision: TransGrid transmission determination 2018 to 2023- Attachment 4: Value of imputation credits*, September 2017

[1665] R. Officer, 'The cost of capital of a company under an imputation system', *Accounting and finance*, vol. 34(1), May 1994, pp. 1–17.

- The construction of the tax building block mirrors the treatment of imputation credits in the framework developed by Officer, including through use of the parameter denoted by the Greek letter 'gamma'.[1666]
- Handley advised that Officer's definition of the nominal vanilla rate of return provides the basis for the rate of return framework in the NER/NGR.[1667]
- The NER/NGR require that we determine the rate of return on a nominal vanilla basis that is consistent with our estimate of the value of imputation credits.[1668]

We do not contend that the Officer Paper is a "statute or a code". However, as the Officer Paper underpins the inclusion of gamma in the corporate income tax formula in NER 6.5.3 and NGR 87A, it is fundamental to a coherent understanding of the role of gamma in the regulatory scheme.

The Officer Paper specifically identified gamma in its WACC formulae to be the "proportion of tax collected from the company which gives rise to the tax credit associated with a franked dividend": It directly supports an interpretation of gamma which is focused on the utilisation or redemption of imputation credits, and an approach to theta which seeks to identify the proportion of investors that are eligible to utilise distributed imputation credits. So much is confirmed by Handley, who states:[1669]

> It is clear from Monkhouse (1996) that the second parameter refers to the utilisation value of a distributed imputation credit. This parameter is commonly denoted and called theta. It is also clear from the post-tax basis of the regulatory framework (and the Officer and Monkhouse WACC frameworks) that the item of interest is more precisely described as the after-company-before-personal-tax utilisation value of a distributed imputation credit.

The Officer Paper makes clear that gamma is:

(a) the proportion of tax collected from the company which gives rise to the tax credit associated with a franked dividend; *which is*

(b) the value of a dollar of tax credit to the shareholder; *with the result that*

(c) if the shareholder can fully utilise the imputation tax credits then the value of gamma =1.[1670]

Our approach to gamma, as drawing upon the Officer Paper, advances the NEO and the NGO and does not detract from those objectives. The purpose of including the

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[1666] R. Officer, 'The cost of capital of a company under an imputation system', *Accounting and finance*, vol. 34(1), May 1994, equation 2.

[1667] J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, pp. 7–8.

[1668] NER, cll. 6.5.2, 6A.6.2; NGR, r. 87.

[1669] Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, pp. 9, 17.

[1670] R. Officer, 'The cost of capital of a company under an imputation system', *Accounting and finance*, vol. 34(1), May 1994, p. 4.

gamma parameter in the corporate income tax formula is to ensure that investors are appropriately compensated having regard to the combined value of dividends, capital gains and imputation credits they receive.

The Officer Paper included the following explanation of gamma at pp. 2-4:

> Under an imputation system, credit is given to shareholders for the company tax implicitly levied on their dividend receipts, i.e. dividends paid after company tax has been levied which implies that the dividends have been taxed at the company level. Under a full imputation tax system, tax that is implicitly being levied on the dividends can be credited against any further tax liabilities of the shareholder (the recipient of the dividend).
>
> The proportion of company tax that can be fully rebated against personal tax liabilities is best viewed as personal income tax collected at the company level. In effect, the tax collected at the company level is a mixture of personal tax and company tax, the company tax being that proportion of the tax collected which is not credited (rebated) against personal tax. If all the collection of tax from a company is rebateable (in the Australian terminology if all the franking credits can be used against personal tax liabilities), then for that company's shareholders company tax is effectively eliminated. The tax the company pays is simply the shareholders' personal income tax being collected at the company level.
>
> The amount of tax collected from the company by the government is found by applying the effective tax rate (T) to the operating income less interest, i.e. $X_O - X_D$.
>
> This amount, i.e. $T(X_O - X_D)$ represents the amount of tax collected from the company but not all of this is company tax. A proportion (γ) of the tax collected from the company will be rebated against personal tax and, therefore, is not really company tax but rather is a collection of personal tax at the company level. Therefore, if we wish to define the effective company tax collection, we need to reduce T by the proportion γ.
>
> In these circumstances, the effective level of company tax paid is defined by:
>
> $XG = T(X_O - X_D) - \gamma \, . \, T(X_O - X_D)$
>
> $= T (X_O - X_D) (1-\gamma)$ (2)
>
> where
>
> T is the tax rate effective for the definition of assessable income as defined in (2), it is the effective rate which is levied at the company level and it is a mixture of company tax T(1-γ) and personal tax, T. γ, i.e. T= T(1-γ) + Tγ. Thus γ is the proportion of tax collected from the company which gives rise to the tax credit associated with a franked dividend. This franking credit can be utilized as tax

> credit against the personal tax liabilities of the shareholder. γ can be interpreted as the value of a dollar of tax credit to the shareholder.

The Officer Paper set out the following example of its interpretation of gamma:[1671]

> For example, if the shareholder can fully utilize the imputation tax credits then ("value") γ = 1, e.g. a superfund or an Australian resident personal taxpayer. On the other hand a tax exempt or an offshore taxpayer who cannot utilize or otherwise access the value in the tax credit will set γ = 0.

While the above passages of the Officer Paper describe gamma using slightly different permutations of language, it is clear that, at its core, gamma is conceptualised by Officer as being concerned with investors' utilisation of tax credits.

Officer describes gamma in different ways, and this is a potential source of ambiguity regarding what the parameter represents and therefore how one might estimate it in practice. Whilst Handley acknowledged that Officer describes gamma in seemingly different ways, he advised that, when examined closely, there is no ambiguity in the meaning of Officer. Handley advised:[1672]

> Similarly, Officer has described gamma in seemingly different ways. For example he refers to:
>
> *"A proportion (γ) of the tax collected from the company will be rebated against personal tax."*
>
> and shortly thereafter:
>
> *"γ can be interpreted as the value of a dollar of tax credit to the shareholder."*
>
> But again, there is no ambiguity. These terms can and have been used interchangeably because the underlying source of value of an imputation credit to shareholders is the consequent reduction in personal taxes in recognition of taxes that were previously paid at the corporate level. In other words, within the Officer framework, it is clear that gamma represents the utilisation or redemption value of imputation credits and this value corresponds to the proportion of company tax which is in effect a prepayment of personal tax by the company on behalf of its shareholders. It is this identification of the personal tax component of the company tax paid which is the central idea of the paper.

In other words, gamma in the Officer framework represents the proportion of company tax that is returned to investors through the utilisation of imputation credits and this is the value of imputation credits to investors. This is the interpretation of the value of imputation credits we adopted in the 2013 Guidelines.

[1671] R. Officer, 'The cost of capital of a company under an imputation system', *Accounting and finance*, vol. 34(1), May 1994, p. 4.

[1672] J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, p. 9.

For this draft instrument, we have reconsidered all the information before us. We propose to continue to adopt the interpretation of gamma as the proportion of company tax that is returned to investors through the utilisation of imputation credits. This interpretation is consistent with the Officer framework and is supported by advice from Handley. We consider our approach is consistent with the Officer framework and our estimation of the required return on equity. We consider what matters from a value to investor's perspective is the face value of imputation credits expected to be utilised as this reflects both the cost of these imputation credits to the service providers and the benefit that investors receive from these credits when utilised to reduce their tax payable (or to receive a refund from the government). The post company (pre-personal) tax value of an imputation credit when utilised is approximately[1673] its face value.

The Officer framework assumes all free cash flows (including imputation credits) are fully paid out each period. That is, the Officer framework is a 'perpetuity' framework. However, in reality not all imputation credits are necessarily paid out each period, nor are all other free cash flows necessarily paid out.[1674] For example, it is typical for a company to retain some earnings from a previous year to fund part of its future investment, rather than pay out all earnings as dividends and fully raise the funding of future investment from external sources. Work by Monkhouse (and others) extends the Officer framework by allowing for less than a full payout of cash flows and imputation credits each period. Handley advised that Monkhouse effectively shows that:[1675]

$$\gamma = F\theta + (1 - F)\psi$$

where:

- F is the proportion of imputation credits generated that are distributed in a period (the 'distribution rate').
- θ (theta) is the utilisation value to investors in the market per dollar of imputation credits distributed (the 'utilisation rate').
- ψ (psi) is the utilisation value of a retained credit to investors in the market.

From the expression for γ above, we have not explicitly included the value of retained credits, ψ, when determining the value of imputation credits. This is mainly because we recognise that investors can only use imputation credits to reduce tax or receive a refund once the credits have been distributed. There is also the practical problem of

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[1673] It is approximately equal due to the time value of money that impacts the present valuation of distributed imputation credits. However, we consider any discounting for this would be immaterial for the reasons discussed in section A.8.4 of attachment 4 to our determination for ElectraNet.
The AER, *Draft decision for ElectraNet transmission determination 2018 to 2023, Attachment 4- Value of imputation credits*, October 2017

[1674] This is evident in companies having positive franking account balances in aggregate.

[1675] Handley considered that, although Monkhouse does not use the term gamma, the interpretation is clear: J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, p. 11 and footnote 12.

how to quantify the value of retained credits. Handley acknowledged the potential for retained credits to have value, but also the difficulty in quantifying it:[1676]

> Retained imputation credits can be worth no less than zero but may be worth more than zero. Estimates of gamma using the traditional approach will therefore be downward biased to the extent that retained imputation credits have value. Although it is not possible to reasonably estimate the magnitude of the bias, its direction is clear.

We agree with Handley and consider assuming retained imputation credits have no value is a conservative assumption. We consider retained imputation credits have a positive value but it is difficult to quantify this value. There are many ways retained imputation credits could potentially benefit investors. For example, retained imputation credits may allow firms to conduct off market buy backs of their own stocks at a discount to prevailing market values. Off market buybacks can be structured in such a way that the purchase price is derived from both fully franked dividends and capital. Investors are prepared to sell back their shares at a discount as they derive value from imputation credits distributed and the capital gains loss that outweighs the capital loss they incur from selling at a discount.[1677] Shareholders that do not participate in off market buybacks benefit from capital appreciation of their shares as the firm's capital is brought back at a discount to the prevailing market prices. An example of a recently completed off market buy back completed a discount that likely was used to stream imputation credits to those who could utilise them most highly was by Caltex Australia.[1678]

However, we consider assuming retained imputation credits have no value might be a reasonable assumption to the extent that imputation distributions rates are expected to remain constant overtime. To the extent firms maintain in perpetuity a distribution rate less than a 100 per cent, the proportion of imputation credits that are not distributed are worthless. As we assume the historical cumulative payout ratios (for listed equity) are reasonable estimates of the future expected payout ratios, we consider our approach is appropriate.

A.4.3 Evidence underlying our estimate

This section discusses the distribution rate and utilisation rate in more detail. More specifically, it describes our approach to estimating these sub-parameters of the value of imputation credits. This includes reasons for the relative levels of reliance we place on the underlying sources of evidence.

[1676] J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, p. 14.

[1677] L. Gitman, R. Juchau and J. Flanagan, *Principles of Managerial Finance*, 6th Edition, 2011, p. 475.

[1678] Caltex Australia Limited, *Off-market buy-back booklet*, 26 February 2016; Caltex Australia Limited, *Caltex successfully completes $270m off-market share buy-back*, 11 April 2016.

The distribution rate

The 'distribution rate' (or payout ratio), represents the proportion of imputation credits generated by a benchmark efficient entity that is expected to be distributed to investors.

For this draft instrument, we have updated the empirical evidence to the latest release. We propose to adopt a payout ratio of 0.83. When combined with a utilisation rate of 0.6, this gives an estimated value for imputation credits of 0.5. In coming to a distribution rate of 0.83, we place primary weight on the distribution rate estimated from:

- the financial reports for the 20 largest ASX-listed firms

We also have regard to the distribution rate estimated from:

- the financial reports for the firms within the same industry as the BEE
- ATO tax statistics

Lally's 20 largest ASX-listed firms

Lally in his reports to the AER considers an appropriate estimate for the distribution rate of the benchmark efficient entity is estimated from the financial statements for the 20 largest ASX-listed firms.[1679] This is because he considers:

- the data from financial statements is of high quality given it is audited and subject to scrutiny in financial markets[1680]
- the data from the financial statements for the top 20 listed firms gives an estimated distribution rate for listed equity that is likely to best reflect the distribution rate of a BEE[1681]
- the listed equity distribution rate from the alternative approach (based on ATO tax statistics) contains significant unresolved discrepancies and the data is unlikely to be suitable for time series analysis[1682]

For this draft instrument, we propose to place primary weight on the distribution rate estimated from the financial statements of the top 20 ASX-listed firms having considered Lally's advice. We agree with Lally that the information from the financial statements is audited and hence it is less likely to produce a biased distribution rate estimate compare to the ATO tax data. Moreover, the ATO in its note recommends the

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[1679] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 19.
M. Lally, *Gamma and the ACT Decision*, May 2016, p. 29.

[1680] M. Lally, *Gamma and the ACT Decision*, May 2016, p. 26.

[1681] M. Lally, *Gamma and the ACT Decision*, May 2016, pp. 4–6, 18, 25. In making this choice, Lally considered there is a trade-off between statistical reliability (which is greater if a market-wide estimate is used) versus potential bias (worse from a sector-wide estimate). Lally discussed various issues with using firm-specific data, industry averages and market-wide data to estimate the distribution rate.

[1682] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 19.

AER to not use the tax statistics as the basis of a detailed macro analysis of Australia's imputation system. 1683 ATO staff also indicated in a meeting with AER staff and representatives from the ENA some limitations with the use of ATO data.[1684] In light of the ATO's note and subsequent discussions with ATO staff, and having had regard to the merits of the evidence before us, we consider a distribution rate estimated from the top 20 ASX-listed firms' financial statements would give us a best estimate for the distribution rate of the BEE.

Lally defines the distribution rate F as the imputation credits distributed divided by the company tax payments to the ATO:[1685]

$$F = \frac{DIST}{TAX}$$

Where the credits distributed is deduced from the fully franked dividends and the corporate tax rate over that period using the following formula:

$$DIST = DIV(\frac{T_c}{1 - T_c})$$

The dividend payments and the part that is fully franked are obtained from the "Dividends" note to the financial statements.[1686]

Lally considers that the tax payments to the ATO are less obvious because the tax payments shown in the "Cash Flow Statement" will include payments to foreign tax authorities and separate identification of the payments to the ATO is not generally made in financial statements. However, the franking balance of an entity will have changed due to tax payments to the ATO and the distributions of credits via dividends over the period t to t+k:

$$B_{t+k} = B_{t-1} + TAX - DIST$$

Which could be written as:

$$TAX = DIST + B_{t+k} - B_{t-1}$$

Where

F denotes the imputation credits distribution rate of a firm over the period t to $t + k$, $DIST$ the imputation credits distributed over the period, TAX the tax paid to ATO over the period, DIV fully franked dividends paid out over the period, B_{t-1} the franking account balance at time $t - 1$, B_{t+k} the franking account balance at time $t + k$, T_c the corporate tax rate over that period.

1683 The ATO, *ATO note to the AER*, 9 May 2018

1684 AER, AER minute of 21 June 2018 ATO meeting with ATO staff and comments on ENA summary, 5 July 2018

1685 M. Lally, *Estimating the distribution rate for imputation credits*, June 2018, p. 2.

1686 This data is drawn from the "Dividends" note to the Financial Statements for each year rather than the "Statement of Cash Flows", because the latter will not include dividends that are subject to a Dividend Reinvestment Plan.

Lally has now looked at the distribution rates for the period 2001 to 2017 of the top 20 ASX listed businesses.[1687] He considers more data would yield a more precise estimate but it also would raise the risk of bias arising from data that is not recent being unrepresentative of the current situation.[1688] Furthermore, the availability of financial statement data tails off from before 2000. Therefore, Lally considers it is appropriate to use the data since 2000.[1689]

Based on his approach, the most recent data gives a distribution rate of 0.88 after adjusting for the credits recycled within the companies over the period 2001 to 2017.[1690] We note a distribution rate of 0.88 and a utilisation rate of 0.6 give a value of imputation credits of 0.53, which we have rounded down to 0.5. To ensure consistency between the rate of return parameters and given we have used an overall (rounded) value of imputation credits of 0.5 and a utilisation value of 0.6 (used for estimating historically realised excess market returns), this implies a distribution rate of 0.83.

We consider a gamma value of 0.5 based on a utilisation rate of 0.6 and a distribution rate of 0.83 will result in equity investors in the benchmark efficient entity receiving an ex ante total return on equity commensurate with the efficient equity financing costs of a BEE. In coming to this decision we have also taken into account the submissions and the issues discussed in the concurrent evidence session on the distribution rate of a BEE.

Some businesses in their submissions argue that Lally's distribution rate derived from the financial statement of the top 20 listed firms does not give an accurate reflection for the benchmark efficient entity being a highly levered and capital intensive firm.[1691] Sadeh in the concurrent evidence session argued that the service providers retain large proportion of its profit to constantly reinvest it into the businesses and thus it would have a lower distribution rate than the average entity.[1692]

[1687] We note for a few firms the first few years financial reports in the 2001 to 2017 period were not available. Where this is the case Dr Lally has looked at the data from when it was available to the end of 2017.

[1688] M. Lally, Estimating the distribution rate for imputation credits, June 2018, p. 3.

[1689] Lally calculated the distribution rate for the period 2001 to 2017. However, the calculation for the distribution rate for that period requires the data from the 2000 financial statements.
M. Lally, Estimating the distribution rate for imputation credits, June 2018, p. 3.

[1690] The credit recycled refers to the credits flow within companies, eg company A pays company B franked dividends. This would lead to double-counting of distributed credits when estimating the distribution rate if it is not appropriately adjusted. Lally considers the distribution rate adjusted for credits recycled should be determined as follows: d=(DIST-DR)/(DIST+ΔFAB), where DIST denote the credits distributed by a firm over a period of time, DR is the credits received within that period and ΔFAB is the change in the franking account balance over that period.
M. Lally, *Estimating the distribution rate for imputation credits*, June 2018, p. 8.

[1691] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 11; NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 18; APGA, *Submission to the Issues Paper*, 12 December 2017, p. 10; Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6; CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, pp. 77-78.

[1692] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 100.

By contrast, CRG considers the electricity and gas network industry is in a mature market with largely mature technologies. Whereas they consider most firms listed on the stock exchange are in growth industries which can be expected to be withholding dividends to finance an expanding capital base.[1693]

Given the arguments above, we have examined the actual growth in the regulated asset base of the network businesses to get a better understanding of the BEE. In the submission to the AER, ENA submits that there has been little growth in RAB since the 2013 Guidelines. It submitted that the average real rate of growth in RAB between 2013-14 and 2016-17 was approximately 1.9 per cent per annum for the electricity networks across the national electricity market.[1694]

We do not consider the growth figure of 1.9 per cent supports the businesses and Sadeh's argument that the service providers would have a lower distribution rate than the average entity or Lally's top 20 ASX listed firms because they retain large proportion of its profit to constantly reinvest it into the businesses.[1695]

Moreover, we consider even if a service provider required a relatively large amount of equity capital to be invested into its asset base each year on top of the allowed revenue for the depreciation they get from the regulator, there are number of ways that firms could fund their growth. This includes through the use of dividend reinvestment plans and secondary equity raisings. In particular, dividend reinvestment plans allow companies to retain their earnings while still distributing a high proportion of their imputation credits generated to shareholders. Therefore, for a BEE that operates efficiently, we do not agree with the businesses that it is necessarily true that the BEE would retain a larger proportion of its profit to fund its growth and thus have a lower distribution rate than the average entity or Lally's top 20 firms.

We note of the firms within the top 20 ASX firms Lally examined, 17 have used dividend reinvestment plans between 2001 and 2017, with only BHP, CSL and Westfield appearing to have not run dividend reinvestment programs over the period.[1696]

We note the CRG proposes that the distribution rate could be estimated from the equation below:[1697]

$$1 - \frac{I - D}{RAB * WACC}$$

[1693] CRG, *Submission to the AER on its Rate of Return Guideline Review*, May 2018, p. 60.

[1694] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p .25.
RAB data collected from RFMs published by the AER as part of determinations for individual service providers, and from annual Economic Benchmarking RIN responses.

[1695] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 100.

[1696] Annual reports of the top 20 ASX listed firms examined by the AER. We note CSL annual reports were not readily available to AER staff for reporting years 2001 through 2004 and it is possible CSL ran a dividend investment program at some stage in this period.

[1697] CRG, *Submission to the AER on its Rate of Return Guideline Review*, May 2018, p. 59.

Where I denote the value of new and replacement asset, D the value of depreciation.

We have considered the CRG's proposed approach. We consider this approach is based on the assumption that apart from the revenue compensation it gets from the regulator for asset depreciation, a BEE could only fund its investment through retained earnings. However, as explained above, firms have access to different sources of finance to fund their investment, and may run dividend reinvestment programs to retain earnings while still maintaining a high franking credit distribution rate. Therefore, we do not consider the equation above based on the assumption would give a reliable estimate of the distribution rate.

Gray in the concurrent evidence session also argued that most of Lally's top 20 firms have material foreign income and it would not accord with the definition of the BEE.[1698] Lally recognizes that amongst the sample of 20 firms he looked at, many firms have foreign operations, which he considers are irrelevant to a BEE and these foreign operations could affect their distribution rate.[1699] However, he considers the effect of including the firms with foreign operations is to underestimate the distribution rate for the benchmark firm.[1700] This is based on his earlier analysis on the seven largest firms listed on the ASX which demonstrated that firms with more foreign income have a smaller distribution rate.[1701] If the firms with significant foreign operations are deleted at 25 per cent significant level, then the two principle candidates for deletion are BHP and Rio Tinto. This raises the estimated distribution rate from 0.88 to 0.95.[1702] Taking this into account, Lally considers the appropriate estimate for the distribution rate of the benchmark firm (which has no foreign operations) is at least 0.88.[1703]

The AER agrees that the lower distribution rates of BHP and RIO are materially reducing Lally's estimate of the distribution rate and exclusion of these would increase the estimate. We also note that the four lowest distribution rates in Lally's sample are Rio Tinto (Group) at 0.76, Woodside (Group) at 0.74, BHP (Group) at 0.70 and Woolworth (Group) at 0.78. The first three are relatively high risk mining companies and may not be particularly representative of the BEE that is relatively lower risk.

For the reasons outlined above, we do not consider that a distribution rate based on Lally's top 20 listed firms of 0.88 would be expected to overestimate the efficient distribution rate for the BEE. We consider the analysis and data supports that the BEE would be expected to be able to distribute at least 88 per cent of its credits while funding any required capital investment.

[1698] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 76.
APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 16.

[1699] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 6.

[1700] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 6.

[1701] M. Lally, *Issues in the estimation of gamma*, April 2017, pp. 9-12.

[1702] The distribution rate of 0.95 is calculated by AER staff based the figures in table 1 of Lally's report :
M. Lally, *Estimating the distribution rate for imputation credits,* June *2018, p.10.*

[1703] M. Lally, *Estimating the distribution rate for imputation credits,* June 2018, p. 9.

Lally has also examined the distribution rate of five firms from the same industry as the BEE over the last 10 years.[1704] Of the three firms for which the distribution rate can be estimated, Lally found a distribution rate of 1.[1705] This is higher than the distribution rate of 0.88 from Lally's updated analysis of the top 20 listed firms. Lally prior to his update of the distribution rates to 2017 considered this would support his earlier conclusion that the appropriate estimate for the distribution rate of the benchmark firm is at least 0.83.[1706] We consider this also supports his updated estimate based on data to 2017 of at least 0.88.[1707] We discuss this further below.

Gray also argued that Lally's approach for estimating the distribution rate from financial statements is subject to various difficulties requiring adjustment.[1708] One example involves BHP. Gray argued that BHP Ltd has distributed over $1 billion of credits in BHP Plc to UK shareholders as part of its 'dividend equalisation scheme' which are completely wasted.[1709] However, Lally considers this issue involves the utilisation rate rather than the distribution rate and hence it will not affect our estimates for gamma.[1710] We agree this is a utilisation rate issue.

Another example presented by Gray relates to AGL, which has had a $300 million tax liability overturned. Gray argued that this refund would affect the estimated distribution rate if the period used to calculate it included the refund but not the original tax payments.[1711] Lally considers the same issue would also affect the ATO data and this is not a good reason for not using financial statement data.[1712]

We note that in the 2013 Guidelines we considered the distribution rate should be estimated on a market wide basis given the challenges of estimating it on either a firm-specific or industry specific basis.[1713] Sadeh in the concurrent evidence session argued that the distribution rate should be based on all equity and the estimate for the listed equity has to be the upper bound.[1714] For this draft instrument, we departed from our previous approach and consider the distribution rate for the BEE should be estimated from listed equity. This is based on Lally's advice, including advice at the time of the 2013 Guidelines, that the distribution rate is a firm-specific rather than a market-wide parameter and the more recent Lally advice that an estimate from the top 20 ASX firms

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[1704] This includes APA Group, AusNet Services, DUET Group, Envestra and Spark Infrastructure.

[1705] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 20.

[1706] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 20.

[1707] M. Lally, *Estimating the distribution rate for imputation credits,* June 2018, p. 9.

[1708] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 77.

[1709] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 77.

[1710] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 31.

[1711] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 77.

[1712] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 31.

[1713] AER, *AER Explanatory statement – rate of return guideline*, Dec 2013, p. 164.

[1714] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 100.

supports an estimate of at least 0.88.[1715] Lally considers that most of the regulated firms are either listed or owned by listed firms. Therefore, a distribution rate estimate from listed equity would be appropriate for the BEE.[1716] Having considered the distribution rates achieved by the top 20 ASX firms from 2001 to 2017, we consider the BEE can be expected to distribute at least 88 per cent of its generated imputation credits. We also note a distribution rate estimate based on listed ASX firms is consistent with our primarily reliance on equity beta estimates from ASX listed firms for estimating the benchmark efficient firm's equity beta.

Further, we consider that many unlisted firms are owned by individuals who have an incentive to reduce dividends to limit the amount of tax paid at higher marginal personal rates. Hence, the dividend policy of these firms would be different from the BEE and a distribution rate from all equity will result in overcompensation for the BEE. Moreover, we do not consider the distribution rate based on listed equity has to be the upper bound.

The ENA submitted that an estimated distribution rate from the top 20 ASX firms suffers from the same issues as identified with ATO Franking account balance data.[1717] We do not agree with this submission. First, the top 20 ASX firms used to estimate the distribution rate are stable through time and therefore this analysis does not suffer the material entry and exit problems inherent in the use of aggregate ATO FAB data. For example, in the ATO FAB data set some firms will disappear over time due to liquidation causing leakage. Second, the data used for analysis of the distribution rate of the top 20 ASX firms is audited financial data and therefore is expected to be more reliable than the ATO FAB data which is based informational data on tax filings.

Having considered all submissions and the experts' advice in the concurrent evidence session, we consider an estimate of the distribution rate from the top 20 listed firms' financial reports would give us a better estimate of the distribution rate for the BEE than the distribution rate from the ATO FAB data on listed equity. In coming to this view we have had regard to the fact the ATO data on the distribution rate contains significant unresolved discrepancies and we consider is likely to result in a materially less reliable estimate of the distribution rate for the BEE. The ATO has recently advised the AER that this may be caused by the dynamic nature of the tax system meaning the FAB data is not suitable for time series analysis, although the dividend data may be somewhat more reliable for estimating a market wide distribution rate. We note the national value of imputation credits from the ATO tax statistics after adjusting for the BEE's distribution rate also supports a gamma of at least 0.5.

[1715] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 18.
M. Lally, *Estimating the distribution rate for imputation credits,* June 2018, p. 9.

[1716] M. Lally, *The estimation of gamma,* November 2013, pp. 10-11; M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 19.

[1717] ENA; *Response to additional AER and Australian taxation Office materials- estimating the value of imputation credits*, 29 June 2018

ATO tax statistics estimates

The ATO publishes aggregate statistics on the tax returns submitted by individuals, superannuation funds and companies, as well as on the imputation credits refunded to certain income tax exempt entities (for example, charities).[1718] It also publishes aggregate statistics on tax paid and franked dividends distributed by companies.

In the 2013 Guidelines we applied the cumulative payout ratio approach using ATO franking account balance data to estimate the distribution rate. This approach calculates the proportion of imputation credits generated (via tax payments) that have been distributed by companies over a certain period of time. For this draft instrument, we continue to adopt this approach. However, instead of placing primary weight on the data from the ATO on the accounts used by companies to track their stocks of imputation credits ('franking account balance') for calculating the distribution rate, we propose to place more weight on the data from the financial statements of the top 20 ASX firms.

In coming to this decision, we have considered all the relevant information before us including a report by Hathaway, which identifies a significant discrepancy associated with the tracking of imputation credits in the ATO data.[1719] Hathaway found the franking account balance (FAB) data and dividend payment data from ATO tax statistics gives two different estimates of the distribution rate. Given the underlying issues with the tax statistics, Hathaway suggests to 'urge all caution in using ATO statistics for any estimates of parameters concerned with imputation credits'.[1720]

We have updated the empirical evidence for this guideline. The FAB data suggests a distribution rate of 76 per cent for listed equity and 68 per cent for all equity.[1721] Whereas the dividend data suggests a distribution rate of 57 per cent for all equity. We consider the limitations of a distribution rate or utilisation rate from the ATO tax statistics include:

- It gives two estimates for each gamma sub-parameter.
- It is not clear which estimates should be used (although it now appears likely the FAB data is likely to be the less reliable).

[1718] These statistics are available at: https://www.ato.gov.au/About-ATO/Research-and-statistics/Taxation-statistics/. Accessed 9 April 2015.

[1719] N. Hathaway, *Imputation Credit Redemption ATO data 1988–2011 Where have all the credits gone?,* September 2013,

[1720] N. Hathaway, *Imputation credit redemption ATO data 1988–2011: Where have all the credits gone?*, September 2013, p. 5.

[1721] The cumulative payout ratio is for the period 2004 to 2016 based on Hathaway's advice that the ATO statistics are subject to a number of issues prior to 2004.
N. Hathaway, *Imputation credit redemption ATO data 1988–2011: Where have all the credits gone?*, September 2013, para. 32.

- The note based on the information from the ATO indicates potential issues with using the tax statistics to estimate the gamma parameters.[1722]

In addition to Hathaway's report, we have also taken into account a recent ATO note to the AER, a meeting with ATO staff to discuss the limitations with ATO data, a recent submission by the ENA, and a further note by Hathaway in reaching our draft instrument decision. The ATO in the note recommends the AER to not use the taxation statistics data as the basis of a detailed macro analysis of Australia's imputation system.[1723] In particular, the ATO has indicated a key concern is with the dynamic nature of the tax system meaning the FAB data is not suitable for time series analysis. This was confirmed in a subsequent meeting with ATO staff. Given the ATO has indicated the unresolved discrepancies in Hathaway's paper are likely driven by the issues with using the FAB data as the basis for a macro-economic analysis of the Australian imputation system, we have placed greater reliance on the other data. This means we now have somewhat more confidence in estimates from ATO data of credits created, credits redeemed and imputation credits distributed. We consider greater reliance is also justified given the combined ATO data (excluding the ATO FAB data) produces an estimated utilisation rate of around 0.6 which is close to the estimated utilisation rate based on the equity ownership approach based on ABS data. As noted above, in coming to this view we have considered discussions held between AER and ATO staff and ENA representatives on 21 June 2018. The background to these discussions is contained in an AER staff minute of the discussions.[1724]

Lally in his overview report expresses his concern with using the ATO data for estimating gamma parameters and suggests the use of financial statements for estimating the distribution rate.[1725] The CCP also proposes to place limited weight on the tax statistics, although some experts have suggested various ways in which these statistics might be used.[1726] It considers all the suggested methodologies face the same underlying issues.[1727]

The ENA and several service providers argue that the best estimate for gamma is to use credits redeemed to company tax paid from the ATO taxation statistics, which suggest a gamma of 0.34.[1728] This is supported by a note and subsequent

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[1722] The AER, *Note on ATO staff response to AER staff inquiries about Hathaway's 2013 report on imputation credit redemption*, 29 March 2018

[1723] The ATO, *ATO note to the AER*, 9 May 2018

[1724] AER, AER minute of 21 June 2018 ATO meeting with ATO staff and comments on ENA summary, 5 July 2018.

[1725] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 19.

[1726] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 10.

[1727] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 10.

[1728] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 12; NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 3; CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 74; Joint Energy Networks, *submission to the AER*, 4 May 2018, pp. 6-7; Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6; ATCO Gas, *Submission to the AER: Review of rate of return guideline-evidence*

memorandum from Hathaway that suggest the ATO data could provide a reliable estimate of gamma.[1729] Gray in the concurrent evidence session considered that the company tax paid and credits redeemed data from the ATO to be reliable and would provide a direct estimate of gamma across the economy.[1730]

However, Lally considers this approach suffers from four drawbacks. He states:[1731]

> "Firstly, even if gamma were correctly estimated, the Officer model also requires an estimate of the utilization rate in order to estimate the MRP, that estimate would presumably have to use the ATO data if gamma were estimated from the ATO data, and the unreliability of the ATO data in estimating the credits distributed (and hence the utilization rate) would then be problematic. Secondly, the ATO gamma data uses all companies, this implies that the credit distribution rate is estimated for all firms, this is inappropriate for the regulated businesses, and would underestimate their distribution rate. Thirdly, Hathaway's belief that the ATO data used to estimate gamma are "100% reliable" is contradicted by the ATO (as reported by the AER), in claiming that Hathaway has used the wrong figure for company tax. Fourthly, the fact that the ATO data offers two conflicting estimates of the credits distributed and neither Hathaway nor the ATO can reconcile this discrepancy ought to make any observer sceptical about anything drawn from the ATO database."

We agree with Lally that this approach for estimating gamma involves a number of potential issues. In particular, we consider that even if the credits redeemed and company tax paid calculated from the ATO taxation statistics were reliable, a market wide value of imputation credits which implies a distribution rate estimate from all equity is not representative of the value of imputation credits to the BEE. We consider the distribution rate of a BEE should be firm specific and should be estimated from listed firms for the reasons discussed in the previous section. We do not consider an estimate of the distribution rate from all equity data an appropriate estimate.

In the concurrent evidence session, Wheatley argued that this apparent pitfall from using the ATO data on all firms to estimate gamma, which involves using a market wide distribution rate being a poor proxy for the BEE, can be overcome.[1732] This can be done by adjusting the gamma estimate for any difference between the distribution rates at which the representative company distributes credits and the rate at which a benchmark entity distribute credits.[1733] This approach is adopted by APA and

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sessions, 4 May 2018; *Response to additional AER and Australian taxation Office materials- estimating the value of imputation credits*, 29 June 2018.

[1729] ENA, *Submission on rate of return issues paper- Attachment C- Letter- Tax statistics*, 12 December 2017; N. Hathaway (Capital Research), Memorandum - *Response to three questions asked by the ENA,* 28 June 2018.

[1730] CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 74.

[1731] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 37.

[1732] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 116.

[1733] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 116.

AGPA.[1734] We note the most recent ATO data suggests a gamma of 0.35. If we use Wheatley's suggested approach and Lally's suggested distribution rate of at least 0.88 for the BEE, an adjusted estimate of gamma will be at least:

$$0.35 \times \frac{0.88}{(0.68 + 0.57) \div 2} = 0.49$$

This supports our estimate of the value of imputation credits of 0.5. It implies a utilization rate of 0.55 which is slightly lower than the estimate of 0.6 from the ABS equity ownership data. For completeness, we also note that the use of a distribution rate based on listed equity only from ATO tax statistics when multiplied by a utilization rate of 0.6 would also produce a value of imputation credits of 0.5 when rounded.

We note the ATO has now advised us that the distribution rate estimated from the FAB data appears to be of low reliability due to the dynamic nature of the tax system.[1735] It appears that the ATO considers the discrepancy in Hathaway's analysis between the FAB and dividend data is potentially due to the issues with using the FAB data as the basis for a macro-economic analysis of the Australian imputation system. We note the dividend data may not have the time series issues the FAB data has as it should reflect a summation of dividends distributed in given years. On the basis a national gamma value can be calculated from ATO data, and assuming the dividend data provides an estimate of the national distribution rate consistent with this figure, we consider an estimate of gamma can be calculated that is adjusted for the estimated distribution rate of the BEE as follows:

$$0.35 \times \frac{0.88}{0.57} = 0.54$$

Lally expressed his concern about using Wheatley's approach. He considers it is possible that both of the distribution rate estimates from the ATO data are wrong and this possibility undercuts the use of any such adjustment to the gamma estimate of 0.35 to reflect the distribution rate for the BEE.[1736] However, following the most recent ATO advice we are now somewhat less concerned with the use of the dividend data for the above adjustment. We also note the ATO dividend data implies an estimated utilisation rate as follows

$$\frac{0.35}{0.57} = 0.61$$

This is largely consistent with the ABS equity ownership data and also consistent with our estimated imputation utilization rate of 60 per cent. As noted earlier, this

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[1734] APA, *Submission responding to discussion papers and expert evidence*, 4 May 2018, pp. 11-12.
APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 18.

[1735] ATO, ATO Note – Franking account balance – tax of time series data from Taxation Statistics, 9 May 2018; AER, AER minute of 21 June 2018 ATO meeting with ATO staff and comments on ENA summary, 5 July 2018.

[1736] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, pp. 33-34.

consistency gives us comfort in placing somewhat more reliance on the ATO dividend data.

Having considered all the information before us, we consider a value of imputation credits of 0.5 will provide for a post company tax return on equity inclusive of imputation credits at least sufficient to contribute to a rate of return that meets the ARORO.

The AER intends to continue to work with the ATO to better understand the ATO data sets, and the reliance that should be place on the different data sets for estimating gamma, in advance of the final Guideline being published in Dec 2018.

Comparators from the same industry

Our definition of the benchmark efficient entity is an entity that operates in Australia and has a similar degree of risk as that which applies to the particular service provider. To estimate the distribution rate for the BEE, we consider an appropriate approach is to use data from a broader range of companies that are comparable to the BEE in a relevant way. Consistent with our view, the CCP and APGA proposes that the AER should define the BEE and identify comparator companies that are most consistent with the BEE in estimating the distribution rate.[1737]

In practice, it is difficult to construct a data set for such companies. Lally suggests one option is to pick a collection of companies within the same industry as the BEE.[1738] He considers that the five listed energy network businesses that examined by the AER for the purpose of estimating gearing would seem to be the appropriate comparators.[1739] This includes APA Group, AusNet Services, DUET Group, Envestra (now Australian Gas Networks), and Spark Infrastructure. However, only three of the firms that Lally looked at have the data available. The data suggests a distribution rate of 1 over the last ten years in all three cases.[1740] This supports Lally's updated estimate of the distribution rate for the benchmark firm of at least 0.88.

The CCP agrees with Lally that it considers the distribution rate can be best calculated from the actual behaviour of individual network companies or a relevant group of companies that fit within the AER's definition of the BEE, including the existing networks.[1741]

However, the main issue of using the industry data is the set of firms is not large. Lally considers the choice of whether or not to include certain marginal cases is likely to

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[1737] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 131; APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 16.

[1738] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 95.
M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 18.

[1739] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 95.

[1740] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 20.

[1741] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 131.

have a material impact on the resulting estimate.[1742] We agree with Lally that the distribution rate of the comparators could give us guidance on the distribution rate of the BEE. However, given the sample size is relatively small we consider we should place less weight on it.

Further issues

In the concurrent evidence session, Gray suggested that the distribution rate for the BEE could be implied from the dividend payout rates of some suitable comparators.[1743] He considers if one characteristic of the BEE is a firm who operates within Australia, the dividend distribution rate and the credits distribution rate would be the same.[1744]

Lally considers that this approach could only work if you assume the denominator in the dividend payout rate is the taxable income for which tax payments are made to the ATO less the tax payment, rather than accounting profit or net cash flow after tax.[1745] We agree with Lally that accounting profits and taxable income are two fundamentally different concepts. The accounting profit reported in the financial statements could be quite different from the actual taxable income firms reported to the ATO for tax purpose. Firms may have lower taxable incomes than the economic profits recorded in their statutory accounts or pay no tax for a range of reasons. Some of the major reasons include:[1746]

- Businesses losses: The tax law recognizes companies can and do incur business losses. It allows these losses to be carried forward and recouped, for tax purposes, against subsequent profits. The same business and continuity of ownership tests provide integrity to the loss rules. Taxable income can be reduced by losses incurred in previous years, reducing the company's taxable income below its accounting profit. Over the past 10 years, 20 per cent to 30 per cent of Australian Securities Exchange (ASX) 500 companies have reported a net accounting loss in any given year.
- Special tax rules for trusts: Trusts are widely used for investment and business purposes by large corporate groups. Trusts are treated as taxpayer entities for tax administration purposes. The trustee is responsible for managing the trust's tax affairs, including paying some tax liabilities. When shares in some companies are sold together with units in an associated trust, they are said to be 'stapled' together. Income from the trust is returned by the unit holder in their return rather than by the company. This results in company taxable income returned being much

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[1742] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 19.

[1743] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, pp. 112-114.

[1744] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, pp. 112-114.
Dividend distribution rate is calculated as dividend distributed/ net profits or dividend distributed/operating cash flow after tax. These number can be found in financial statements. Whereas the distribution rate for imputation credits is calculated as imputation credits distributed/ tax paid to the ATO. Firms do not report their taxable income lodged to the ATO or tax paid to the ATO in the financial statements.

[1745] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 31.

[1746] See: https://www.ato.gov.au/general/tax-and-corporate-australia/tax-is-not-simply-30--of-profit/

less than total business profits, but is offset by the tax payable at the unitholder level.

- Tax concessions: Some features of tax law are designed to stimulate investment and economic growth. These various exemptions and concessions may also explain, in part, why some corporate groups appear to pay tax at a rate less than 30 per cent of the company's accounting profit (and indeed less than 30 per cent of their taxable income). Tax concessions include:
    - research and development expenditure to promote innovation and the social and economic benefits innovation brings
    - capital allowances to encourage business investment through shorter effective lives of assets for tax purposes than for accounting purposes, with particular policy concessions for certain exploration expenditure and capped effective lives for certain depreciating assets. By deferring tax to the later years of an asset's useful life, capital allowances give rise to earlier positive cash flows.
- Offshore companies investing in Australia: Overlaying our Australian tax rules, we have a network of tax treaties to assist international trade and fair taxation. As tax treaties assign taxing rights, they also impact on our domestic tax payments. Guidelines agreed by Australia and other countries at the Organisation for Economic Cooperation and Development (OECD) set the correct way to resolve taxing disputes.
- Investing in Australian companies: Under the imputation system, a share of corporate tax paid is imputed to shareholders. The shareholder declares both the dividend they receive and an imputed amount of corporate tax. The imputation or franking credit offsets the shareholder's tax liabilities. An Australian company that has a stake in another Australian company will not pay tax on a dividend twice. If the other company pays a franked dividend, it will not be taxable again in the hands of the shareholding company. This is even though it may be included in the accounting profits of the shareholding company.

For the reasons outlined above, we consider it is likely that firms would report a higher profit in the financial reports to the shareholders than the profit reported to the ATO. As a result, we consider a distribution rate estimated from the dividend payout rate with the denominator of accounting profit or net cash flow is likely to materially underestimate the actual distribution rate of a BEE.

A utilisation rate based on the dividend payout rate would therefore be expected to overcompensate the firms and their investors for the efficient costs that the firms incur in providing their network services. We do not consider this will meet the requirement

of the NEL/NGL. We note the CCP also expressed its concern of using Gray's proposed approach in estimating the distribution rate.[1747]

Lally considered another possible way of estimating the distribution rate for the BEE is by referring to the service providers' actual imputation credits distribution rate.[1748] However, he considered the problem with that is the company would have a strong incentive to manipulate its distribution rate.[1749] We do not consider this approach will necessarily create an incentive for the service provider to operate efficiently knowing that their actual imputation credits distribution rate will affect their regulatory revenue. Rather, we consider it is likely to promote the businesses to adopt a distribution policy that would maximise their regulatory revenue. This may not necessarily be in the long term interest of the consumers, or consistent with achieving the NEO/NGO.

The utilisation rate

The 'utilisation rate' is the value to investors of utilising imputation credits per dollar of imputation credits distributed.[1750] In the Monkhouse framework, the utilisation rate is equal to the weighted average, by wealth and risk aversion, of the utilisation rates of individual investors. For an 'eligible' investor, each dollar of imputation credit received can be fully returned to the investor in the form of a reduction in tax payable or a refund.[1751]

For this guideline, we consider the utilisation rate should be based on the body of utilisation rate estimates with regard to its strengths and weaknesses. This includes the equity ownership approach, ATO tax statistics and implied market value studies. With current evidence, we consider this suggest an estimated utilisation rate of approximately 0.6 is reasonable. In coming to a utilisation rate of 0.6, we have updated the data to the latest release and we place:

- significant reliance upon the equity ownership approach
- limited reliance upon tax statistics
- limited reliance upon implied market value studies.

In reaching our view, we have re-examined:

- The representative investor in the Officer model
- The empirical evidence of sources for the estimate including the equity ownership approach, tax statistics estimates and various implied market value estimates

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[1747] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 131.

[1748] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 95.

[1749] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 95.

[1750] In this decision we use the terms theta, utilisation value and utilisation rate interchangeably to mean the same thing.

[1751] This is the return to eligible investors before administrative costs, personal taxes and diversification costs. Handley advises that this is the desired basis for the utilisation rate.

The representative investor in the Officer model

Before reaching our view on the best approach for estimating the utilisation rate, we consider the definition of the representative investor.

To answer the question of the appropriate representative investor, we have considered:

- the Sharpe–Lintner CAPM framework under imputation as derived in Officer, Monkhouse, Lally and Van Zijl, and Lally[1752]
- the construction of the corporate tax building block in the rules and how this interacts with the Officer framework used within the rate of return
- the experts' opinion in the concurrent evidence session
- analysis of the framework by academic expert Lally

The Rule requires that the estimate of the value of imputation credits to be consistent with each interrelated element of the regulatory scheme. The Capital asset pricing model (CAPM) we use for the return on equity estimation assumes the national equity markets are segmented. This implies all the assets in the equity markets are owned by domestic investors and there is no foreign investment. Under this assumption, all the investors are eligible to redeem the imputation credits and therefore have a utilisation rate of 1. This is supported by Lally and Gray.[1753]

However, we consider the assumption of no foreign investment and no foreign investors would not reflect the empirical reality. In light of this we consider a more appropriate way to estimate the utilisation rate is to recognize the existence of foreign investors. In particular, we consider that domestic investors are eligible to utilise imputation credits and would have a utilisation rate of 1. Conversely, foreign investors cannot utilise imputation credits and would have a utilisation rate of 0. It follows that the utilisation rate reflects the extent to which investors can utilise the imputation credits they receive to reduce their tax or obtain a refund.

This approach was reviewed by Lally. He concurs with the AER's view that the Officer CAPM assumes a segmented market where the utilisation rate is 1. However, he considers it is not necessarily wrong for the AER to include foreign investors in estimating the utilization rate in the belief that this produces more realistic results.[1754] If foreign investors are taken to be incorporated into the model, Lally suggests the utilisation rate should be defined as a weighted average of the utilisation rates of

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[1752] R. Officer, 'The cost of capital of a company under an imputation tax system', *Accounting and finance*, May 1994, vol. 34(1), pp. 1–17; P. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance*, November 1993, vol. 33(2), pp. 1–18; M. Lally and T. van Zijl, 'Capital gains tax and the capital asset pricing model', *Accounting and finance*, July 2003, vol. 43(2), pp. 187–210; and M. Lally, 'The CAPM under dividend imputation', *Pacific accounting review*, December 1992, vol. 4(1), pp. 31–44.

[1753] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, pp. 106-108.

[1754] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 4.

individual investors.[1755] This is consistent with the AER's current interpretation of the utilisation rate.

We conclude that the representative investor:

- is a domestic investor who is eligible to redeem all the imputation credits available under the construction of the domestic CAPM
- or, is the weighted average of investors within a defined market with the presence of both domestic and foreign investors, where the weightings reflect wealth and risk aversion.

We consider both definitions of the representative investor could meet the ARORO. However, for this draft instrument we continue to recognise the existence of foreign investors in the equity market and consider that a utilisation rate estimated from a weighted average over the utilisation rates of all investors in the Australian market remains appropriate. Having reached this view, we consider it has important implications for the practical task of estimating the value of imputation credits.

Arriving at an estimate of the utilisation rate

We propose to estimate the utilisation rate using the body of relevant evidence with regards to its strengths and weaknesses. In particular, we consider the concurrent evidence session on imputation credits was very useful in assisting us to reach a view on whether we should continue to have regard to datasets for both all equity and listed equity only when determining a utilisation rate.

Lally also consider the utilisation rate should be based on all equity given it is a market wide parameter.[1756] We agree on this point, although we note the ENA proposes that the AER should assess the assumed composition of the shareholder base of the BEE in estimating the utilisation rate.[1757]

We agree that the utilisation rate should be seen as a market wide parameter and therefore consider that it is appropriate to refer to market wide estimates to assess the utilisation rate. Following from this, we therefore are no longer placing reliance upon equity ownership data for listed equity only when determining the utilisation rate. We consider it is not necessary to estimate the distribution rates and the utilisation rates from the same dataset based on the theory indicating the distribution rate is firm specific while the utilisation rate is market wide. This is supported by Lally, APGA and the CCP.[1758] Nevertheless, we note the current utilisation rate estimated from ABS

[1755] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, pp. 106-107.

[1756] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 95.

[1757] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 83.

[1758] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 95.
Lally's view on this issue appears consistent with the views of Gray. See Frontier Economics, *An appropriate regulatory estimate of gamma*, June 2015, pp. 12–13.
CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 10.

listed equity data when combined with a distribution rate of 0.88 still supports a gamma value of 0.5.

This section addresses:

- the equity ownership approach—on current evidence, this suggests an estimate between around 0.6 and 0.7
- tax statistic estimates—on current evidence, these suggest an estimate of 0.51 based on the FAB data and an estimated of 0.61 based on the dividend data
- implied market value studies—on current evidence, these suggest an estimate between 0 and 0.5. In particular, the adjusted estimate from SFG dividend's drop off study suggests a utilisation rate of 0.4.

The equity ownership approach

The equity ownership approach estimates the value-weighted proportion of domestic investors in the Australian equity market. This reflects that generally, domestic investors who are eligible to utilise imputation credits would have a utilisation rate of 1 whereas foreign investors would have a utilisation rate of 0. We use data from the National Accounts of the Australian Bureau of Statistics (ABS) to estimate the domestic ownership share. The most recent updated ABS data gives a range of 0.6 to 0.7 for all equity. The point estimate for the December 2017 quarter indicates a utilisation rate based on domestic ownership of 0.65.

We place significant reliance upon the equity ownership approach when considering estimates of the utilisation rate. This is because:

- it is well aligned with the definition of the utilisation rate in the Monkhouse framework
- it employs a relatively simple and intuitive methodology
- it uses a reliable and transparent source of data
- it provides estimates of the utilisation rate for investors in all equity

In the overview report to the AER, Lally agrees with the AER that in the presence of foreign investors, the utilisation rate is equal to the proportion of Australian equities owned by local investors.[1759] He considers one should use the data from the Australian Bureau of Statistics to estimate the utilisation rate if the empirical reality of foreign investors is to be incorporated in the model.[1760] Moreover, Lally suggests that the ABS data on all equity should be used in estimating the utilisation rate whereas the distribution rate should be estimated from only a subset of firms.[1761] Lally considers

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APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 15.

[1759] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 18.

[1760] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 18.

[1761] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 26.

there is good reason not to match datasets.[1762] He suggests a utilisation estimate of around 0.6 based on the most recent updated data.[1763]

The CCP in its submission to the AER agrees with Lally that the utilisation rate of the BEE should be estimated from the ABS data for all equity.[1764] It recommends a gamma of at least 0.5 based on a distribution rate between 0.75 and 0.83 and a utilisation rate of 0.65 from the equity ownership approach.[1765] It considers a gamma of 0.5 will result in an effective adjusted tax allowance of 15 per cent which is closer to the reality of the actual taxation paid by the networks but will still overcompensate the firms given the imputation credits.[1766]

- We note that ENA submits that the AER should examine the composition of the shareholder base of the BEE in estimating the utilisation rate.[1767] In response we note that the domestic Officer Model assumes all the assets in the equity market are owned by domestic investors. This implies the BEE is owned by domestic investors and hence it suggests a utilisation of 1. However, we consider this assumption does not incorporate the existence of foreign ownership. We acknowledge that in reality there is foreign ownership in the Australian market. We consider the utilisation rate estimate from the equity ownership approach that incorporates the existence of foreign ownership would be reflective of a BEE. We also agree with Lally that the utilisation rate is a market wide parameter and a utilisation rate from listed equity is not representative of the BEE.[1768]
- We note that CRG in its submission proposes a utilisation rate of 1 based on the assumption that a BEE would use the most efficient source of funding from Australian sources.[1769] Nonetheless, as discussed earlier, we consider that an estimate of the utilisation rate from the equity ownership approach (that incorporates foreign investment in Australian equity) is more reflective of the reality and remains appropriate.
- In the submissions, some businesses argue that the utilisation rate estimate from the equity ownership approach does not take into account investors who receive imputation credits but do not redeem them.[1770] Our view is consistent with Lally's

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[1762] M. Lally, *Issues in the estimation of gamma*, April 2017, p. 13.

[1763] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 18.

[1764] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 132.

[1765] A distribution rate of 0.75 is from the ATO tax statistics for all equity and a distribution rate of 0.83 is based on Lally's top 20 listed firms.
CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 119.

[1766] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 132.

[1767] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 89.

[1768] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 95.

[1769] CRG, *Submission to the AER on its Rate of Return Guideline Review*, May 2018, p. 59.

[1770] Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6

advice that such matters are only significant to the extent that such non redemptions are significant and there is no evidence showing that.[1771]

- The businesses also argue that the equity ownership estimates of the utilization rate based on ABS data require filtering and adjustment, and may be subject to sampling error.[1772] We consider such data issues would also apply to the alternative approaches. The estimates based on ATO data also requires filtering that may be subject to sampling error. Moreover, the large unexplained discrepancies in the ATO data give rise to significant different estimates which led Hathaway to 'urge all caution in using ATO statistics for any estimates of parameters concerned with [imputation] credits'[1773].
- The results from the market value studies are subject to considerable statistical uncertainty, the actions of tax arbitrageurs, a very wide range of results, significant sensitivity to a number of methodological choices, data filtering rules, deletion of outliers and data around ex-dividend dates that are known to be afflicted by anomalous behaviour.[1774] Lally considers relative to the problems associated with the estimates based on ATO tax data and market value studies, the concerns expressed about the ABS data are almost inconsequential.[1775]

ENA also submits that the recent data released by the ABS raises more questions about the reliability of the equity ownership estimates than were apparent at the time of the 2013 Guidelines.[1776] We have examined the recent ABS releases which include a technical note published along with the September 2017 Finance and Wealth publication data. We note that the ABS has undertaken some quality assurance work for the historical data through reviews of compilation methods and through source data across the National Accounts. The time series was opened back to 1988 in this review. The Finance and Wealth publication has incorporated the revisions as a result of the historical review.[1777]

Given the purpose for this revision is to improve the quality of the ABS data, we consider the updated ABS data would be more reliable. As a result, it would produce a more reliable estimate of the utilisation rate than the utilisation rate estimated from the earlier ABS release. ENA argues that the revision to the ABS data is based on a 'backcasting' exercise that could be less reliable than the estimates that it made at the

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[1771] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 28.

[1772] Cheung Kong Infrastructure, *Review of the Rate of Return Guideline*, 12 December 2017, pp. 5-6; APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 16.

[1773] N. Hathaway, *Imputation credit redemption ATO data 1988–2011: Where have all the credits gone?*, September 2013, paras. 9 and 99–100.

[1774] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 28.
M. Lally, *Gamma and the ACT Decision*, May 2016, p. 22.

[1775] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 28.

[1776] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 91, p. 11.

[1777] A technical note which provides details about the major quality assurance work that was undertaken can be found at:
http://www.abs.gov.au/AUSSTATS/abs@.nsf/Latestproducts/5232.0Technical%20Note1Sep%202017?opendocument&tabname=Notes&prodno=5232.0&issue=Sep%202017&num=&view

time the historical data was collected.[1778] However, the data from the most recent December 2017 release that is not based on 'backcasting' exercise suggests a utilisation rate of 0.65 for all equity, which is within the range of 0.6 to 0.7.

- We note that in the concurrent evidence session, Gray proposed that as the model assumes the equity market is either complete segregation or complete integration, the equity ownership approach in estimating the utilisation rate is not consistent with any equilibrium models.[1779] We note these concerns, although are of the view our equity ownership approach appropriately takes into account the empirical reality of foreign investment in the Australian capital market. Lally considers all three of the methods are taking account of the existence of foreign investors, nevertheless, if we incorporated the existence of foreign investors, the ABS type data should be used for estimating the parameter.[1780]

Gray and some businesses suggest placing some reliance on the equity ownership data while recognising it is an upper bound to the extent that it does not factor in the 45-day rule.[1781] APGA in its submission proposes that the AER should quantify the impact of this rule.[1782] We recognise the equity ownership approach does not take into account the existence of some domestic investors that do not hold their shares for 45 days at risk over the ex-dividend date (the 45 day rule).[1783] However, we consider this is unlikely to have a material impact on the utilisation of imputation credits by domestic investors. This is supported by Lally.[1784] Importantly, no data has been presented that demonstrates a material impact. We also note that 0.6 is at the bottom of the range from ABS all equity data and below the current point estimate from this data. We note for the purposes of consistently estimating the return on equity, we have applied a value for the utilisation rate of 0.6 to post 1988 market return data. Hence, we consider a utilisation rate of 0.6 and our current estimate of MRP that aligns with observed excess market returns since 1988, inclusive of a 60 per cent value for distributed imputation credits, should give the service providers at least adequate compensation to cover their efficient financing costs.

We accept that there are potential disadvantages with the equity ownership approach. Nonetheless, we consider the equity ownership approach provides the most reliable estimate of the utilisation rate given that the alternative approaches are less satisfactory.

[1778] ENA, *Response to discussion papers and concurrent expert evidence sessions*, 4 May 2018, p. 91.

[1779] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 108.
NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 18.

[1780] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 109.

[1781] The AER, *Concurrent evidence session 2- Transcript*, 5 April 2018, p. 115.
APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 16.
NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 18.

[1782] APGA, *Submission to the AER: Review of rate of return guideline*, 4 May 2018, p. 17.

[1783] Australian Competition Tribunal, *Application by Public Interest Advocacy Centre Ltd and Ausgrid [2016] ACompT 1*, 26 February 2016, paras. 1048.

[1784] M. Lally, *Gamma and the ACT Decision*, May 2016, pp. 20-21.

ATO tax statistics estimates

The ATO publishes aggregate statistics on the tax returns submitted by individuals, superannuation funds and companies, as well as on the imputation credits refunded to certain income tax exempt entities (for example, charities).[1785] Theoretically, these statistics can be used to derive a measure of the total amount of imputation credits utilised by eligible investors to offset tax or to be refunded. However, as discussed in relation to the distribution rate, there are underlying data issues with tax statistics. The ATO data gives two distinct estimates for the utilisation rate depending on what data is used. We have had regard to the estimates of the utilisation rate from the ATO tax statistics in determining an estimate of the utilisation rate of 0.6 is appropriate. Lally has also considered the utilisation rate from ATO data should warrant much lesser weight than the ABS equity ownership data.[1786] The most recent updated dividend data suggests an estimated utilisation rate of 0.61, while the Franking Account Balance (FAB) data gives an estimated utilisation rate of 0.51.[1787]

As noted earlier, the ATO has now expressed the view we should not rely on FAB data for undertaking a detailed macro-economic analysis of the Australian imputation system. The ATO considers there are a range of potential issues with the FAB data, particularly the dynamic nature of the taxation system that makes this data unsuitable for time series analysis.[1788] Given this, we now place no reliance on the utilisation rate estimate of 0.51 estimated from ATO FAB data. Based on this most recent ATO advice we consider the utilisation rate estimated using ATO dividend data is likely to be somewhat more reliable, and note it supports a utilisation rate of around 0.60.

Implied market value estimates

Implied market value studies seek to infer from market prices of the value of distributed imputation credits. A wide range of such studies have been conducted over time, employing a variety of techniques. A common type of implied market value study is a dividend drop off study. These studies compare the price of a security with and without

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[1785] These statistics are available at: https://www.ato.gov.au/About-ATO/Research-and-statistics/Taxation-statistics/. Accessed 9 April 2015.

[1786] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 18.

[1787] We use cumulative redemption rate for the period from 2003-4 to 2015-16 based on Hathaway's findings that the ATO statistics are subject to a number of issues prior to 2004. NERA considers that the cumulative approach gives an estimate that is least likely to be affected by potential distortions in the underlying data set.
We adjust the dividend data for the imputation credits recycled within companies based on the number calculated in Hathaway's 2013 report. Hathaway calculated the credits recycled for the period from 2003-4 to 2010-11 was 66 billion. We assume the credits recycled each year is constant, hence the credit recycled in one year is 66/8=8.25 billion. This is because there are changes to the definition of some items in the ATO tax data. The data that was used in calculating credits recycled in Hathaway's 2013 report is no longer available.
N. Hathaway, *Imputation credit redemption ATO data 1988–2011: Where have all the credits gone?*, September 2013, para. 32.
NERA, *The payout ratio: A report for the Energy Networks Association*, June 2013, p. 11.

[1788] AER, *Minute of meeting between AER, ATO, and ENA*, June 2018.

the entitlement to a dividend. Econometric techniques are then used to infer the value of the imputation credits attached to these dividends.

We consider the implied market value studies can be subject to a number of limitations and the estimates of the utilisation rate based on these studies can be unreliable. The limitations of implied market value studies can include:

- These studies can produce nonsensical estimates of the utilisation rate; that is, greater than one or less than zero.
- The results of these studies can be influenced by factors, such as differential personal taxes and risk, which are not relevant to the utilisation rate. The utilisation rate should be estimated on a post-company pre-personal tax and costs basis consistent with the allowed rate of return parameters and the post (corporate) tax framework in the NER/NGR. This is supported by the May 2017 Full Federal Court decision that the court found the Rules require consistency in the way the relevant building blocks interact, that is, on a post-company tax and pre-personal tax and personal costs basis.[1789]
- The results of these studies might not be reflective of the value of imputation credits to investors in the market as a whole. For instance, in dividend drop off studies the value of imputation credits is determined by the marginal investor that trade around the ex-dividend date.[1790] There is no reason to assume this reflects the value that long term investors who provide capital to a benchmark efficient entity place on imputation credits in aggregate. There is also no reason to assume this value will show what proportion of company tax is a prepayment of personal tax.[1791]
- These studies can be data intensive and employ complex and sometimes problematic estimation methodologies.
- Regarding dividend drop off studies, it is only the value of the combined package of dividends and imputation credits that can be observed in the market. However, there is no consensus among experts on how to separate the value to the market of dividends from the value to the market of imputation credits (this is referred to as the 'allocation problem').

We note Lally in his recent report to the AER considers the market value studies could give a utilisation rate that is on a post-company pre-personal taxes and personal costs basis so long as these market value studies are correctly interpreted.[1792] To illustrate this point, he gives an example of the dividend drop-off studies where he shows that as

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[1789] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, p. 216.

[1790] J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, p. 44; A. Ainsworth, G. Partington and G. Warren, *Do franking credits matter? Exploring the financial implications of dividend imputation*, June 2015, p. 18;

[1791] J. Handley, *Report prepared for the Australian Energy Regulator: Advice on the value of imputation credits*, 29 September 2014, p. 44; A. Ainsworth, G. Partington and G. Warren, *Do franking credits matter? Exploring the financial implications of dividend imputation*, June 2015, p. 18.

[1792] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 24.

long as an appropriate adjustment is made to the estimated coefficients on the dividends and the imputation credits, the dividend drop-off studies could give an estimate of a utilisation rate that is on a post-company pre-personal taxes and costs basis.[1793]

We remain of the view that the relevant adjustment proposed by Lally will not necessarily fully account for the potential effect of personal taxes and costs. The adjustment suggested by Lally would only address factors which affect both dividends and imputation credits to the same proportionate degree. However, there are factors identified by SFG which could affect investors' valuation of imputation credits (as reflected in share prices) but would not affect investors' valuation of dividends.[1794] Therefore, it does not appear that the proposed adjustment—which only addresses factors which affect both dividends and imputation credits—would exclude the effect of the factors identified by SFG as affecting just imputation credits. Moreover, we consider these studies do not clearly measure the utilisation value to long term investors. We therefore consider even the estimated coefficients on the dividends and the imputation credits are adjusted, it still may not give a reliable estimate for the utilisation rate.

Moreover, given the residual concerns about the market value studies and what they are measuring, we have placed limited reliance on estimates of the utilisation rate from these studies. This is consistent with the views we have expressed in all determinations since the 2013 Guidelines, including the final determination for AusNet Services that sets out our detailed considerations on the matter. [1795] Our decision to place limited weight on dividend drop off studies is supported by Lally.[1796] The CCP in its submission also considers the market studies should be given no role in the estimation of gamma.[1797]

The NSG considers that the value of imputation credits should be interpreted as the market value and the utilisation rate should be estimated from market value studies.[1798] It argues that one dollar income is not valued the same as one dollar in franking credits.[1799] However, we consider our current 'utilisation' approach for this draft instrument is consistent with our estimate of the Vanilla WACC and application of the post-tax revenue model and the Full Federal Court decisions on the value of imputation

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[1793] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, pp. 23-25.

[1794] Gray for SFG identified some factors that would affect just imputation credits.
SFG, *An appropriate regulatory estimate of gamma*, 21 May 2014, para. 65.

[1795] The AER, *Final decision: AusNet services transmission determination 2017-2022, Attachment 4- Value of imputation credits*, April 2017, p. 42.

[1796] M. Lally, *Review of the AER's views on gearing and gamma*, 7 May 2018, p. 18.

[1797] CCP16, *Submission to the AER on its Rate of Return Guideline Review Concurrent Evidence Sessions*, 4 May 2018, p. 130.

[1798] NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 18.

[1799] NSG, *Submission on the Rate of Return Guideline review*, 4 May 2018, p. 18.
CEPA, *Expert Joint report: Rate of return guideline review- facilitation of concurrent expert evidence*, 21 April 2018, p. 69.

credits.[1800] The Full Court found that the Rules require consistency in the way the relevant building blocks interact, that is, on a post-company tax and pre-personal tax and personal costs basis.[1801] As discussed in section A.4.1, we consider the estimates from the market value studies, which is on a post personal tax and personal basis basis, is not consistent with the allowed rate of return parameters and the post (corporate) tax framework in the NER/NGR.

Our current approach for estimating the value of imputation credits is supported by the Full Federal Court. The Full Federal Court found that it was not an error of construction for the AER to focus on utilization rather than on implied market value.[1802] It also found the Tribunal erred in concluding that the value of imputation credits is (only) the value claimed or utilised as demonstrated by the behaviour of the shareholder recipients of the imputation credits.[1803]

In light of the ongoing concerns with estimates from dividend drop off studies and given Lally's advice, we consider that implied market value studies provide limited guidance on the utilisation rate.

In the 2013 Guidelines we considered that implied market value studies supported an estimate of the utilisation rate between 0 and 0.5.[1804] This range was determined with regard to a range of studies, with more weight given to those studies that:

- used longer data periods
- used data since 2000, when the change in tax law entitled eligible investors to a refund of credits that exceeded their tax liability
- encompassed the breadth of the market instead of just selected firms, and
- appeared to use more reasonable and robust econometric treatments.

In this draft instrument we recognise the limitations of a utilisation rate estimated from these studies and propose to place limited weight on the implied market value studies in arriving at our estimate for the utilisation rate. [1805]

[1800] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017
Federal Court of Australia, *SA Power Networks v Australian Competition Tribunal (No 2) [2018] FCAFC 3*, Jan 2018

[1801] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, para. 752.

[1802] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, p. 216.

[1803] Federal Court of Australia, *Australian Energy Regulator v Australian Competition Tribunal (No 2) [2017] FCAFC 79*, May 2017, p. 216.

[1804] The AER, *AER explanatory statement: Rate of Return guideline*, December 2013, p. 176.

[1805] We discuss the experts view on implied market value studies and our consideration in detail in our recent decisions for the service providers. For example, see: AER, *Draft decision: ElectraNet transmission determination 2018 to 2013, Attachment4- Value of imputation credits*, October 2017, pp. 40-45, pp. 184-214.

We note that, in coming to our view on the weight to give to the implied market value studies and in determining an estimate for the utilisation rate of 0.6 is appropriate, we have had particular regard to SFG's 2016 dividend drop-off study at the adjusted estimate of the utilisation rate from this study of 2011, which suggests a utilisation rate of 0.4 after making the adjustment suggested by Lally and Handley. The consideration of the SFG work is set out in detail in section A.15.2 of Attachment 4 to our final determination for AusNet Services.[1806]

[1806] The AER, *Final decision: AusNet services transmission determination 2017-2022, Attachment 4- Value of imputation credits*, April 2017, pp. 177-185.

B CEG return on debt memorandum

The ENA submitted a presentation and a further CEG memorandum on 21 June 2018 setting out methodological recommendations on Chairmont's methodology.[1807] [1808]

As the material was provided in the final days before we published our draft guideline, we have not had substantial time to review this paper. This section sets out some initial responses to issues raised in CEG's memorandum. Many of these issues were raised in our one-on-one meetings with service providers and we have extended our analysis to consider them.

Overall, we think the ENA and CEG material raises a number of issues worth considering. Most importantly, we agree that it is important to undertake analysis to test the impact of term on the cost of debt. In particular, as discussed in section 10.3, we have maintained the benchmark term of 10 years. In doing so, we have had regard to the submission made by the ENA and other networks that reliance on a simple average of terms across instruments issued from 2013−17 may understate the benchmark term.

Further, we also sought in our discussion paper to account for the term at issuance to isolate the other aspects of our approach. In particular, we included in our discussion paper analysis of spread differences between the service providers' actual debt instruments and our curve providers using matched terms. We have updated this analysis in this draft guideline to accommodate the RBA's revisions to historical bond yield data, and have considered a series of potential adjustments recommended by CEG and the ENA.

Similarly, we agree that it is appropriate to update our data series to reflect the RBA's revisions to its historical F3 data series on which our approach is based in part. We discuss this in greater detail in section 10.4. We have reflected this both in:

- An updated time-series comparison of the EICSI against our approach at the 10 year benchmark term
- Updated analysis of spread differences at matched terms.

In total, this analysis reduces the apparent discrepancy between the AER's estimated cost of debt and the index of actual cost of debt estimated by Chairmont. However, it does not eliminate the discrepancy and a material outperformance remains. Based on our analysis of spread differences at matched terms, reliance on broad-BBB third party yield curves indicates that service providers have raised debt at spreads to swap that are on average 27 basis points below those implied using a combination of BVAL and RBA yield curves at matched terms. We set out this analysis in greater detail in section 10.5.

[1807] ENA, *AER Debt issues paper: Analysis*, 22 June 2016.

[1808] CEG, Memorandum: ENA debt data, June 2016.

While we agree with some issues raised by the ENA and in the CEG memorandum, we do not agree with all of these submissions. In particular, we think the material proposing an inflation adjustment misrepresents the regulatory framework we employ. In 2017 we undertook a major review of the treatment of inflation in our regulatory approach and we point to the material developed during that review to address CEG's submission.

The following sections address the major topics raised in the CEG memo.

B.1 Overall role of the EICSI

As identified in our discussion paper, comparison of the AER's approach over 2013-17 compared to actual debt instruments serves as a sense check of:

- Our benchmark characteristics (term and credit rating)−for example, our current benchmark term is 10 years. Collection of information on actual return on debt issuances allows us to evaluate directly whether the service providers have been issuing debt at terms reflecting this assumption.
- How we implement these benchmark characteristics−for example, we rely on a set of third party yield curves with a number of adjustments in order to estimate the yields on AUD BBB+ corporate debt.

That is, we are not undertaking a reconciliation of NSPs actual revenues and costs. Rather, we are reviewing the overall reasonableness of our benchmark allowance consistent with the principles of incentive regulation.

B.2 Adjustment for outturn inflation

CEG submits that, in order to fully consider compensation under the AER's current approach, it is necessary to make an adjustment for the difference between:[1809]

- The AER's estimates of expected inflation, less
- Outturn inflation.

In our view, CEG's submissions on this topic do not accurately reflect the character of the regulatory framework we employ.

In December 2017 we completed a sector wide review on the regulatory treatment of inflation.[1810] In this review, we addressed the issue of compensation for inflation outcomes in substantial detail. Having done so, we concluded that:[1811]

> Our current approach targets the delivery of the initial real rate of return (derived from the initial nominal rate of return and expected inflation) plus actual inflation outcomes over the regulatory period. Targeting the real rate of

[1809] CEG, *Memorandum: ENA debt data*, June 2016, p. 3.

[1810] AER, *Regulatory treatment of inflation−Final position*, December 2017.

[1811] AER, *Regulatory treatment of inflation−Final position*, December 2017, p. 63.

return means that revenues received by the service provider move in the same direction as inflation. If actual inflation outcomes are below expected inflation, service providers recover less revenues than expected; but if actual inflation outcomes are above expected inflation, service providers recover more revenues than expected.

Our final position is to continue to target the initial real rate of return on capital. This approach is consistent with the NER and NGR. We consider that there is a strong economic rationale behind an approach that targets the initial real rate of return. It provides stable real returns to investors and stable real prices to customers.136 We have consistently applied this approach in all our previous electricity and gas decisions (including relevant decisions by the ACCC prior to the formation of the AER). Our method for estimating the rate of return—in particular, the method for estimating equity beta—is consistent with this inflation approach. Hence, we are satisfied that service providers receive the correct overall compensation package.

The ultimate compensation provided in the regulatory framework is a real rate of return. When we estimate total revenue in our determinations we calculated an expected real revenue stream based on our best estimate of expected inflation. In each subsequent year of a regulatory determination we then adjust actual revenue according to a CPI – X formula. Thus, in most cases, actual revenue will deviate from the expected revenue set in our determination. However, this does not imply that service providers are not appropriately compensated for inflation. This is a design feature of the regulatory regime.

CEG's comparison is based on the premise that we should deliver a nominal rate of return. We considered this approach extensively in our inflation review, but concluded that we should continue to provide a real rate of return. For the reasons set out in our review of the regulatory treatment of inflation, we do not agree that CEG's conclusions about compensation arising from out-turn inflation are valid.

B.3 CEG's other recommended adjustments

In the remainder of its memorandum, CEG has proposed a series of other adjustments to Chairmont's methodology for compiling and comparing the EICSI and our subsequent analysis of it. We address the recommended adjustments in this section:

- Incorporating the RBA's data update
- Weighting instruments by tenor
- Weighting only the days on which debt is issued
- Recommendation to include callable and subordinated debt in the sample
- Recommendations about the treatment of fees
- Recommendation to excluded selected instruments from the sample
- Inclusion of debt raised in 2018.

Incorporating the RBA's data update

In its 3 June 2018 update, the RBA revised its historical data series on which our estimates are based.[1812] We discuss this in section 10.4.

We agree that all analysis and estimates should be updated to reflect the RBA's revised series and have done so for the analysis underlying this draft decision, including our analysis of spread differences at matched terms.

Weighting instruments by tenor

In line with the ENA's submission on our discussion paper, CEG recommends weighting individual instruments by term.[1813] We consider the usefulness of this recommended adjustment differs between:

- Estimation of an average term at issuance over the benchmark sample
- Our further analysis of spread differences at matched terms.

Estimation of benchmark term

With respect to estimating the average term at issuance over the full EICSI sample, we agree that a simple average may underestimate benchmark term due to overrepresentation of short term debt if that short term debt is frequently refinanced.

For the reasons set out in section 10.3, our decision is to maintain a 10 year benchmark term. However, we do not agree that the weighting system proposed by the ENA necessarily better reflects the benchmark term because it relies on material assumptions, including:

- That the same annual issuance pattern occurs in equilibrium
- Shorter term debt never grows in materiality within the portfolio
- Debt is always refinanced with debt of the same term.

Based on our discussions with service providers and our analysis of the data, it is clear that these conditions do not alwayshold over the 2013-17 sample. However, we do recognise that this recommendation highlights a potential shortcoming of a simple average where some or all of those conditions do hold. We have tested the sensitivity of our estimate to one such factor by determining the average term where instruments are issued by size of the debt instrument (face value at issuance). This resulted in an estimate of term issued over 2013–17 of 7.4 years.[1814] We consider this adjustment relies on fewer material assumptions, but it does not fully address the potential for over-representation of short-term debt instruments.

[1812] See RBA, *Changes to statistical tables*, 5 June 2018—Available at: http://rba.gov.au/statistics/tables/changes-to-tables.html

[1813] CEG, *Memorandum: ENA debt data*, June 2016, p. 4.

[1814] AER, Discussion paper—Estimating the allowed rate of return on debt, May 2018, p. 31.

In our view, an alternative option to address this issue would be to compile the full sector portfolio using consistent adjustments with those used to compile the EICSI sample over 2013-17. We have data available for this exercise as we also requested all instruments in the starting portfolio at 1 January 2013. However, we have not yet requested Chairmont to undertake this analysis and will consider doing so prior to the final guideline.

Weighting by tenor for analysis of spread differences at matched terms

In contrast, we do not agree that there is a conceptual basis for weighting by terms in our analysis of spread differences at matched terms. In this exercise, for each instrument in the EICSI sample for which BVAL and RBA yield data is available, we have compared:

- Spreads to swap on the service providers' debt instruments on the day they were priced; against
- Spreads to swap using our mix of third party yield curves (broad-BBB only and 2/3 broad-BBB 1:3 broad-A, Bloomberg and RBA curves) at the term at issuance of the corresponding instrument on the date at which it was priced.

Having already accounted for the term at issuance and date of issuance, we do not agree that there is a reason to weight further for the term of debt.

Weighting only the days on which debt is issued

Like the recommendation of weighting by matched terms, we consider the potential impact of this adjustment differs between:

- Estimation of an average term at issuance over the benchmark sample
- Our further analysis of spread differences at matched terms.

On term, we agree that there may be some mismatch arising from comparing a 12 month rolling average of all issued debt in the EICSI sample, noting that instruments are likely to be issued only on a proportion of days within the 12 months, against a 12 month average of the AER's approach. Our decision is to retain the 10 year benchmark term.

In contrast, for analysis of spread differences at matched terms, our analysis already compares differences only on days at which bonds were issued. We consider there is no need for further adjustment.

Recommendation to include callable and subordinated debt in the sample

We do not agree with CEG's recommendation to include callable and subordinated bonds within the sample. We reach this view because:

- Bond optionality can materially affect both the cost of that debt in addition to the interpretation of the term of that debt instrument in a way that is difficult to reliably

control for. For example, a debt instrument may have a long term to maturity, but be callable substantially before that term.

- The RBA, Thomson Reuters, Bloomberg and S&P Global all exclude subordinated debt from their samples for estimating corporate yield curves
- All providers except for RBA exclude debt with embedded options other than make-whole callable debt.
- CEG submits that the impact of including callable and subordinated debt is 3 basis points. We consider this magnitude is immaterial to conclusions that might be reached on the sample.

Where make-whole callable debt has been identified in the EICSI sample, Chairmont has not excluded it.

Recommendations about the treatment of fees

In its analysis, Chairmont has included fees within its estimates of spreads on the following basis:[1815]

> Fees associated with debt raising are only included if they act as an additional borrowing margin, such as line fees or commitment fees, as these are constant costs that are sometimes applied in place of a higher lending margin on bank debt. Other fees such as undrawn fees or establishment costs are not considered part of the borrowing margin. The former is a substitute for the borrowing margin, when the loan is undrawn, while the latter is a debt raising expense, which AER treats separately in its allowance consideration.

We agree with Chairmont's approach. As Chairmont observes, we separately make allowance within the building block framework for:

- An allowed return on debt- the ongoing costs (interest rate) of debt
- Debt raising costs for the financing of debt

In contrast, CEG has included all fees (including up-front fees) within its estimates of spreads on the basis that, in CEG's estimation, they exceed the AER's allowance of debt raising costs. We do not agree with this adjustment because:

- Service providers have previously proposed to the AER that, in addition to its standard allowance for debt raising costs, it should also allow further costs for the fees associated with maintaining dedicated liquidity facilities as required by credit ratings agencies.
- We have in the past rejected those fees on the basis that the favourable timing allowances in the PTRM (designed to account for working capital or liquidity) swamp the magnitude of those proposed allowances.

[1815] Chairmont, *Aggregation of return on debt data*, April 2018, p. 6.

As we noted in our 2014 draft decision for Transgrid:[1816]

> In 2002, Allen Consulting Group (ACG) provided the ACCC with a report on working capital. Working capital is one measure of a service provider's liquidity. It is calculated as current assets minus current liabilities. 'Current' refers to assets/liabilities that will be realised/settled within 12 months. Strictly, TransGrid's proposed allowance is designed to meet S&P Global's definition of liquidity as opposed to working capital. However, while S&P Global's definition of liquidity includes some additional items to that of the strict definition of working capital, the overall concept is the same—that is, that there be enough cashflow and liquid assets to meet short term liabilities over a 12 month period.
>
> The report concluded that, because the PTRM assumes service providers receive revenue on the last day of the year, target revenue would offset any shortfall in the cost of financing operating expenditure (the required return on working capital). The report states:
>
> > These results provide no rationale for including an additional allowance in target revenue to provide a return on working capital. Rather, the results suggest that, were further precision to be sought in relation to the within-year timing of cash-flow – which underpins the arguments for a return on working capital – then the likely outcome is that the more precise target revenue would be lower than that derived using the PTRM.
>
> Further, ACG found that:
>
> > The results above imply that [a working capital] allowance is unnecessary – while there may be a (small) financing cost associated with operating expenditure, any shortfall from not including an allowance in respect of working capital is likely to be swamped by the favourable allowance provided in respect of capital assets under the PTRM target revenue formula. It follows that if the Commission were to pursue further precision in relation to the assumptions it makes about the within-year timing of cash flow – which underpins the arguments for a return on working capital – then the likely outcome is that more precise target revenue would be lower than that derived using the PTRM.
>
> ACG tested the magnitude of the favourable timing assumptions on a case study of a gas service provider. They found the timing assumptions in the PTRM provided a favourable 'bias' of 1.8 per cent of revenue compared to the revenue required to maintain adequate working capital. …
>
> In 2007, we identified that the PTRM has been modified since the 2002 ACG report to recognise capex in the middle of each year, while still assuming revenues are received on the last day of the year. In practice, this modification means that we add an additional half year of WACC to all capex in the year that it enters the capital base, in order to adjust for the time value of money. Service providers recover this incremental addition through increased depreciation and by increased return on capital while the capex is being depreciated. While

[1816] AER, *Draft decision− TransGrid transmission determination− Attachment 3: Rate of return*, November 2014, pp. 329-330

> strictly related to capex timing, this change further benefits the service provider and heightens the favourable cash-flow timing assumptions in the PTRM. This means that the level of the favourable 'bias' in the PTRM is in our view now greater than what was estimated by ACG in 2002. For these reasons we consider there is no need for an additional explicit allowance for liquidity costs, as service providers are already implicitly and sufficiently compensated for such costs.

In our view, this captures the type of fees that CEG proposes to include within its comparison of spreads. For example, undrawn fees are the costs paid by networks to reserve facilities to provide dedicated liquidity support.

Using ACG's initial estimate of 1.8 per cent of revenue as upward bias in the PTRM's timing assumptions is equivalent to increasing the estimated return on debt by approximately 46 basis points applied to the full regulatory asset base as opposed to only a subset of the instruments.[1817] This estimate does not take account adjustments to the PTRM to add a half year of WACC to all capex, and so may materially understate the favourable upward bias from PTRM timing assumptions.

Recommendation to excluded selected instruments from the sample

CEG proposes to exclude 9 debt instruments with terms at issuance between 0–6 years from its sample on the basis that:[1818]

- CEG has graphically identified these bonds as upward outliers, and
- the instruments were raised within a period of time in which 5 year spreads to swap within the RBA curve exceeded the spread to swap on 10 year debt.

We do not agree with this adjustment, because:

- There is no theoretical reason to conclude that credit spreads at a shorter term cannot exceed credit spreads at a longer term. This could simply reflect investors' forward expectations, or reflect lower perceived credit risk on companies able to raise longer term debt in the corporate bond market.
- Even if we accepted that a downward sloping spread-to-swap curve was evidence of anomalous data, neither the available evidence nor Chairmont's quote that CEG has referred to supports a conclusion that the 5 year spread to swap is elevated over the time period referred to.
- All stakeholders proposing to rely on third party yield curves, including all networks and investors, continue to recommend reliance on the RBA and BVAL curves. Having accepted that the methodology underlying these curves is fit for purpose,

[1817] We have estimated this using AusNet Services' electricity distribution PTRM for 2016-20.

[1818] CEG, *Memorandum: ENA debt data*, June 2016, pp. 13-14.

we consider it is impractical and potentially asymmetrical to selectively remove observations from within those curves.

In particular, even if we agreed this was evidence that the term profile of the RBA curve did not accurately reflect market conditions, it is unclear whether this reflects elevated spreads on 5 year debt or depressed spreads on longer term debt. If we assumed the latter, this would suggest that differences on longer term debt over the corresponding time period are being understated.

Similarly, there may be other periods of time within the sample, not identified by CEG, in which the RBA or BVAL curves produced an inaccurately low estimation of the spreads at a particular term.

Further, even if we concluded that it is not appropriate to rely on that RBA data over the specific time period identified by CEG, it is unclear why instruments issued in this period should be excluded from the sample rather than simply relying on the BVAL data for the period.

Inclusion of debt raised in 2018

The ENA also recommended in its submission that we should include debt instruments issued in 2018.[1819] CEG appears to have included this debt in its analysis based on its figure 3-1.[1820]

We initially sought debt data from service providers in a request dated 6 February 2018. This data was provided at varying times by respondents to our request up to 15 March 2018. As a consequence, we have been provided with a small sample of data for 2018.

Due to the low number of instruments issued in 2018 included in responses to our information request, we have not included this data in our sample. Nonetheless, we consider the inclusion of 2018 data may justify further consideration in developing the final instrument. We may be able to supplement the data already received with a further data request to generate a material sample for 2018.

[1819] ENA, *Estimating the allowed return on debt—Response to AER discussion paper*, May 2018, p. 21.

[1820] CEG, *Memorandum: ENA debt data*, June 2016, p. 11.

C Illustration of broad credit band weighting

To illustrate our conceptual view on the use of a 2/3 broad-BBB: 1/3 broad-A weighting to implement the benchmark credit rating, we have set out a simple algebraic demonstration below.

This demonstration relies on some simplifying assumptions. The complex curve fitting methodologies employed by various curve providers mean that it is not straightforward to reach conclusions about the ultimate impact of particular bonds on the yield estimates at different points along the term profile. Further, as identified in section 10.5, we consider credit ratings are an informative but imperfect proxy for credit risk.

Nonetheless, to the extent that credit ratings are an informative measure of credit risk, we would expect:

- reliance on a broad-BBB curve only to overestimate the level of credit risk (and ultimately the required yields) of a BBB+ benchmark credit rating− because the benchmark credit rating (BBB+) is the highest rating band amongst the constituents, the inclusion of any of the lower rated bonds in the sample (BBB or BBB-) would, other things held constant, overestimate the required return on debt for the benchmark credit rating
- reliance on a broad-A curve only would underestimate the level of credit risk (and ultimately the required yields) for a BBB+ benchmark credit rating because all constituents (A- ,A ,A+) are higher rated than the BBB+ benchmark credit rating
- some combination of broad-BBB and broad-A curves should therefore provide the best fit to a BBB+ benchmark credit rating. In our view, a 2/3 broad-BBB: 1/3 broad A rating is most likely to match a BBB+ benchmark credit rating.

Credit ratings are discrete variables and cannot directly be 'averaged'. However, credit ratings are primarily a proxy for credit risk (the risk of default).[1821]

If we assume that:

- credit ratings are equidistant in terms of risk (ie A- is as different from BBB+ as BBB is from BBB-),
- over time, the broad credit rating bands are influenced equally by their credit rating constituents (eg the broad BBB curve is influenced equally by BBB-, BBB and BBB+ bonds).

Then, if we assign a BBB- credit rating some level of risk (y), the level of credit risk for each credit rating within the broad BBB and broad A curves can be defined as set out in Table 49.

[1821] See ACCC, Regulatory Economic Unit, *Return on debt estimation: a review of the alternative third party data series – Report for the AER*, August 2014, p. 23.

Table 49 Credit risk for credit ratings based on an equal spread of risk between ratings

Credit rating	Credit risk
BBB-	y
BBB	y+x
BBB+	y+2x
A-	y+3x
A	y+4x
A+	y+5x

Source: AER analysis

The average level of credit risks for the broad bands are then as follows:

Broad BBB only (BBB-, BBB and BBB+ constituents)

$$\mu = \frac{(y) + (y + x) + (y + 2x)}{3}$$

$$\mu = \frac{3y + 3x}{3}$$

$$\mu = y + x$$

This corresponds to an 'average' credit rating of BBB as per Table 49. To the extent that

Broad A only (A-,A,A+ constituents)

$$\mu = \frac{(y + 3x) + (y + 4x) + (y + 5x)}{3}$$

$$\mu = \frac{3y + 12x}{3}$$

$$\mu = y + 4x$$

This corresponds to an 'average' credit rating of A as per Table 49.

2/3 broad-BBB and 1/3 broad A

$$\mu = \frac{2(y + x)}{3} + \frac{(y + 4x)}{3}$$

$$\mu = \frac{2}{3}y + \frac{2}{3}x + \frac{1}{3}y + \frac{4}{3}x$$

$$\mu = y + 2x$$

This corresponds to our benchmark credit rating of BBB+.