Contents

1 Executive Summary

The draft Rate of Return determination overall strikes a reasonable balance between the competing demands of the process. The National Electricity and National Gas Objectives (NEO, NGO) require the process to deliver a decision that is in the long-term interest of customers. Given that the lower the allowed Rate of Return the less customers pay, this would seem to be served by setting the rate of return as low as possible. However, networks are capital-intensive businesses and the long-term interest of customers is not served by setting an inadequate rate of return that does not allow a network service provider to fund the necessary expenditure to maintain and operate the network safely and securely. Nor is it served by volatile decision-making that reduces investor confidence in the sector. With this latter point in mind, the AER has signalled that it sees this rate of return process as evolutionary rather than revolutionary. This may have been interpreted by some stakeholders that certain parameters would be kept constant unless there was overwhelming evidence to adjust them. Rather, it seems that the AER has used largely familiar analytical tools, techniques and sources of evidence to arrive at an overall best estimate of each of the parameters of the rate of return. Arguably some of these estimates are conservative (that is to say, they tend to increase the rate of return) and others less so. Ultimately, it is the overall decision that matters and, on the evidence, available, the draft determination appears reasonable in the context of the very low risk profile of regulated networks. The reaction of the capital markets, while not providing evidence that can be mechanistically fed into parameter estimation, at least has not signalled that the draft determination is materially too low, notwithstanding the rhetoric of investor representatives in this process. Finally, the process itself has been extensive and multi-faceted and represents a full and fair consultation process.

2   Introduction

2.1   Overview of the decision-making process

As the Expert Panel commissioned by the AER noted: "Estimating the rate of return and the value of imputation credits is a complex technical task. It draws from corporate finance theory and practice and requires extensive information and judgement" [1]. The AER has a challenging line to walk. On the one hand, they have an understandable desire to demonstrate the predictability and consistency of the regulatory framework by refraining from making significant changes in parameter values or methodology. This assists with sustaining investor confidence in the framework.

On the other hand, the NEO/NGO require them to make their best estimate of the Weighted Average Cost of Capital (WACC) of a Benchmark Efficient Entity (BEE). Stakeholders have submitted arguments that previous decisions did not do so. We recognise that previous decisions were made in the context of rules that were flawed (i.e. first round of AER decisions, after which the rules were amended) and an asymmetric appeals process.

The AER should evidently put greater weight on making their best estimate of the overall cost of capital than on similarity to previous decisions. However, there is also value in being able to demonstrate some predictability/stability. This extends to the process itself. The current process, which is drawing to is conclusion has been extensive and multi-faceted. The AER has consulted on the process as well as on the substance of the review; it has commissioned input from two different groups of independent experts; it has held public forums and convened stakeholder reference groups (the AEC and its members appreciated the opportunity to meet with AER staff through the Retailer Reference Group); and published staff working papers and correspondence with ATO and RBA on points of clarification of data derived from those organisations. This represents a full consultation process, noting that in doing so a very large volume of relevant material has been created and published, which is challenging for each stakeholder to keep fully abreast of.

In the final analysis, however, the AER must ultimately make a series of judgments regarding parameter values (or formulas in the case of the risk-free rate and the cost of debt). As the decision-maker it must use its own judgement, no individual stakeholder or expert point of view should be considered determinative. While it is important to transparently disclose the evidence and factors that have been considered in arriving at that judgment, there is only so far the AER can go in justifying its decision to choose one parameter value over another within a plausible range. Naturally those that

do not agree with the decision will find some basis for criticism, but on balance, the consultation process appears to have been a fair and thorough one.

This is borne out by the Expert Panel appointed by the AER to review the Draft Guideline. For the most part, according to the Panel, the AER's Explanatory Statement (which justifies the Draft Guidelines) has "set out in significant detail the evidence, analysis and conclusions that the AER has reached in determining each of the rate of return parameters, and the value of imputation credits, to form an overall estimate of the rate of return" [1]. While they also set out 30 recommendations for the AER to provide more clarity of its reasoning to support the decisions it has made, these should be seen in the light of pointers to ways in which the decision process can be tightened up rather than any fundamental flaws in the decision or the way it was arrived at.

Notably, some of the areas it has highlighted are ones where the judgment appears to have led to a lower parameter estimate than otherwise, while others are ones where it appears to have led to a higher parameter estimate. In other words, there is no suggestion of systematic bias in favour of or against the networks in the way the AER has applied its judgment.

2.2   Generic and sector specific parameters

Some of the parameters are generic to any type of business: the risk-free rate, the market risk premium and gamma. Others are specific either to the type of business or at least to the risk profile of the business: beta, cost of debt and gearing. Given that all parameter values contribute to the overall allowed revenue of each network, they all matter and can all be contentious. Nonetheless, stakeholder comments, particularly from the consumer representatives have repeatedly made the argument that previous decisions have not been reflective of the extremely low risk profile that the regulated networks face. Accordingly, these elements appear to be the most contested of the parameters and this report focusses on those. Table 1 below sets out the parameter values and formulae selected by the AER in the Draft Determination.

Table 1: Draft determination – parameter values and formulae

Parameter	2018 Draft Guidelines
Equity beta	0.6
Market risk premium	6 per cent
Equity risk premium	360 basis points
Risk free rate	Average yield of 10-year CGS
Risk free rate averaging period	Averaging period 20 to 60 business days Service providers choose start date for averaging period subject to certain conditions
Gearing ratio	60 per cent
Return on debt approach	Trailing 10-year average, with 10-year transition from 'on the day'
Yield on debt instruments	BBB+ (estimated from 1/3 A band + 2/3 BBB band yield curves) Service providers choose averaging period between 10 business days and 1-year subject to certain conditions
Imputation credits (gamma)	0.5

Source: Independent Panel Review of the AER's Rate of Return Draft guidelines

3   Gearing and cost of debt

3.1   Gearing

In classic capital theory, the level of gearing (the ratio of debt to equity) should not matter. In principle, any ratio of debt to equity should result in the same cost of capital as any other. This is because at higher levels of debt, the riskiness of the cashflows increase and the risk premium of both the cost of equity and the cost of debt increases. In practice, this theory does not hold. A major factor is the tax

deductibility of interest costs, which reduces the effective cost of debt. The theory suggests that a 100 per cent debt structure would thus be the most efficient, but investors do not support such high level of gearing.

The key point is that the gearing level does matter to the overall cost of capital and that firms target their gearing levels accordingly. Many industrial and commercial firms in the competitive sector find that a gearing level of around 30 per cent debt is appropriate, but some firms with more stable cashflows can efficiently sustain higher gearing levels. Regulated network businesses are a good example of such firms, and the AER has consistently used 60 per cent as the gearing level of the BEE.

Determining the optimum gearing level is challenging for the AER. The NEO and NGO require that it attempt to find the gearing level consistent with the lowest cost of capital for the BEE. Part of the challenge is finding appropriate businesses to review what actual gearing levels they appear to prefer. The most relevant businesses are those that own regulated networks themselves and are privately regulated. Other potential comparators may be less relevant as follows:

- State-owned network businesses are not subject to the normal pressures of capital markets and may be able to gear up aggressively under the protection of their government shareholder's sovereign credit rating.

- Unregulated energy businesses (such as the AEC's members) face quite different risks and accordingly their gearing may not be relevant.

- Other regulated businesses, but in different sectors such as water or transport infrastructure may be somewhat relevant, but may face specific differences in their risk profile, both through the nature of their industry and the details of how they are regulated.

- Overseas regulated energy networks may face similar business risks, but again the regulatory framework may operate in different ways.

Accordingly, the AER has used five listed entities, and only three of them are still listed:

APA Group, Ausnet, Duet (now acquired by CKI group), Envestra (now acquired by CKI group) and Spark. Between them these businesses have at least a share of the ownership of many of the privately-owned energy network businesses. The AER has affirmed its preference for using market values of debt and equity to calculate the gearing ratio, but that in practice it has substituted book values for debt. On this basis it has calculated the gearing ratios as on average between 57 per cent (over five years) and 63 per cent (over ten years). In this light 60 per cent seems reasonable and potentially higher than recent norms. There are a couple of factors to consider in evaluating the data, however.

For most of the period under review, APA has had the lowest gearing levels, in some cases 10-15 per cent below the other businesses. It is also the one with the least proportion of its asset base regulated – its major business is owning and operating largely unregulated gas pipelines. Accordingly, it is not as good a proxy for a pure-play regulated energy network business. Additionally, the downward trend in the gearing level in recent years does not appear to be primarily driven by a deliberate degearing through paying down debt, or issuing new equity (see discussion in section 5 below) but rather due to a ramp up in company share prices that has increased the market value of equity. For example, Envestra, which has seen the largest five-year swing in gearing, from 75 per cent in 2009 to 47 per cent in 2014 saw its share price almost triple over this period.

Capital theory suggests that in such a situation, business would actively seek to return to their preferred gearing level via taking out additional debt. As discussed further below, the risk in doing so is that their debt: RAB ratio would have increased (i.e. their market enterprise value was growing faster than their RAB), which could have put their credit rating under pressure, and potentially led to a higher cost of debt.

On balance, such evidence as the AER has available to it appears consistent with its choice of 60 per cent debt gearing, albeit taking account of the factors above it is on the conservative side. Had the AER chosen, say, 65 per cent, this would also have been justifiable on the evidence.

3.1.1 Consistency of the benchmark gearing level and the benchmark credit rating

An important cross check of the AER's parameters is to check that the gearing level for the benchmark entity is consistent with the benchmark credit rating assumed for estimating the cost of debt. As discussed further below, a highly geared business will have a lower credit rating (other things being equal) and vice versa. This check serves two purposes: it helps to ensure that the AER does not inadvertently set the allowance too generously, (by selecting a credit rating lower than what would be expected for a BEE that was geared at the benchmark level) and it also provides a check on the financeability of the BEE. This section focuses on the former purpose.

Credit ratings are determined by several factors, both quantitative (financial ratios) and qualitative (assessments of the regulatory framework, scale of capex program, etc.)

On a purely quantitative basis, for example, Moody's would rate a 60% gearing level as at the boundary of A and BBB [1]. Moreover, its gearing ratio is net debt: RAB, not debt: Enterprise value (i.e. debt + equity). While in the model, these will be equal, enterprise values are often well above RAB (as best one can tell after adjusting for unregulated business, etc.). In such cases a business that is 60%

geared on an enterprise value basis may have debt of 70% or more of RAB. So observed evidence of correlation between EV gearing and credit ratings will tend to lead to a more conservative assessment. Table 2 below illustrates this using some Australian network businesses where data is available:

Table 2: gearing ratio comparison

Year	Net debt: RAB			Gearing (AER)			Difference		
	Envestra	Ausnet	Spark	Envestra	Ausnet	Spark	Envestra	Ausnet	Spark
2017		66.7%	74.0%		51.1%		N/A	15.6%	N/A
2016		67.9%	77.6%		55.1%		N/A	12.8%	N/A
2015		67.2%	73.0%		55.6%	58.0%	N/A	11.6%	15.0%
2014	73.0%	67.5%	77.2%	46.7%	56.1%	56.0%	26.3%	11.4%	21.2%
2013	72.0%	68.6%	78.5%	53.2%	54.1%	63.4%	18.8%	14.5%	15.1%
2012	78.0%	68.1%	79.7%	63.1%	59.2%	61.1%	14.9%	8.9%	18.6%
2011	84.0%	73.1%	81.5%	65.8%	64.0%	64.0%	18.2%	9.1%	17.5%
2010	84.0%	71.0%		74.0%	61.2%	66.6%	10.0%	9.8%	N/A
2009	88.0%	71.0%		75.0%	69.9%	71.0%	13.0%	1.1%	N/A
2008		77.0%		77.0%	59.1%	71.4%	N/A	17.9%	N/A
2007		79.0%		65.2%	54.4%	60.1%	N/A	24.6%	N/A
Average	79.8%	71.9%	79.2%	65.0%	59.8%	64.2%	16.9%	12.2%	17.5%

Source: AER, company accounts.

As the table shows, debt: RAB has averaged over 70% for all the companies analysed, and is closer to 80% for two of them, compared to the 60-65% average gearing based on enterprise values.

Furthermore, the qualitative factors applied to Australian network values will tend to increase the credit rating, as the regulatory framework meets the criteria for A rated or better. This applies

notwithstanding concerns expressed by networks about recent policy and regulatory decisions that affect them. See for example Moody's comment that

"With the regulated networks, the abolition of the Limited Merits Review is manageable and should not detract from the transparent and predicable nature of the regulatory framework" [2].

This is borne out by those business's ability to maintain investment grade (or close to) credit ratings while being very highly leveraged against their RAB.

Table 3 Debt/RAB and credit ratings

Network business	Envestra/Australian Gas Networks		SAPN (ETSA Utilities Finance)		Ausnet/SP AusNet		Victoria Power Networks /CitiPower/Powercor	
Year	Debt/ RAB	Credit rating	Debt/ RAB	Credit rating	Debt/ RAB	Credit rating	Debt/ RAB	Credit rating
2017		BBB+	73%	A-	67%	A-	71%	BBB+
2016		BBB+	71%	A-	68%	A-	72%	BBB+
2015		BBB+	72%	A-	67%	A-	74%	BBB+
2014	73%	BBB+	74%	A-	68%	A-	77%	BBB+
2013	72%	BBB	76%	A-	69%	A-	80%	BBB+
2012	78%	BBB-	79%	A-	68%	A-	81%	A-
2011	84%	BBB-	78%	A-	73%	A-	84%	A-
2010	84%	BBB-		A-	71%	A-		A-
2009	88%	BBB-		A-	71%	A-		A-
2008		BBB-		A-	77%	A-		A-
2007		BBB-		A-	79%	A		A-

Source: AER, company accounts.

As the table shows, companies have frequently maintained BBB+ credit rating or better with a debt/RAB ratio of 70% or more (in some cases 80%). This supports a view that the ratings agencies' qualitative assessment of the regulatory regime under which the networks operate tends to result in a higher credit rating than that implied purely by the leverage and coverage metrics. The latter may of course also be supported by expectations of outperformance against the assumptions used in the regulatory determinations, as this will result in additional cashflow and improve interest cover ratios.

One of the limitations of determining the rate of return as a stand-alone decision across all the regulated networks is that it cannot be cross-checked against the rest of the decisions that go to make up a regulated determination. As a hypothetical exercise, however, one can create a "virtual" network that looks similar to the average regulated network to cross-check the effects of the decision. Using a dummy opening RAB of $1bn, rebasing other key inputs such as depreciation, tax depreciation, capex and opex using an average ratio of each of these to the RAB based on the most recent round of determinations, it is possible to create a plausible, simplified post tax revenue model (PTRM). This can them be used to derive key ratings leverage and coverage metrics. Further details of how this model was created are set out in Appendix 1 below.

The leverage and coverage metrics can then be applied to a ratings agency methodology along with a reasonable qualitative assessment (noting that there may be uncertainty as to whether an actual ratings agency would make the same qualitative evaluations) to provide an indicative credit rating. The results of this exercise are summarised below, using Moody's methodology for regulated gas and electricity networks, as this is the most transparent methodology of those used by the three major ratings agencies. Further details of the exercise can be found in Appendix 2 Credit rating evaluation of a BEE using Moody's methodology.

Table 4 ratings evaluation

Weightings	%	Assessment	Score	Weighted Score
Stability and Predictability of Regulatory Regime	15	Aa	3	0.45
Asset Ownership Model	5	Aa	3	0.15
Cost and Investment Recovery (Ability and Timeliness)	15	A	6	0.9
Revenue Risk	5	Aa	3	0.15
Scale and Complexity of Capital Program	10	A	6	0.6
Financial Policy	10	A	6	0.6
FFO + interest/interest	10	Baa	9	1.035
net debt/RAB	12.5	A	6	0.75
FFO/net debt	12.5	Ba	12	3
RCF/net debt	5	Baa	9	0.5175
	100	**Baa1**		**8.1525**

Source: [2], internal analysis

A weighted score of between 7.5 and 8.5 corresponds to Baa1 in Moody's ratings, equivalent to BBB+ using Standard and Poor's or Fitch's ratings system. Businesses sometimes find themselves a notch higher with one ratings agency than another due to the qualitative nature of setting and maintaining ratings, although no one agency is considered to be systematically more generous with its system than the others.

This exercise supports the AER's combination of 60 per cent gearing with a BBB+ benchmark credit rating for determining the cost of debt. One complication is that the data sets the AER uses has data either for all A rated debt or all BBB rated debt and not for specifically BBB+. The AER's decision to address this using a 1/3 weighting of the A-rated data series and a 2/3 rating of the BBB data series appears to be a pragmatic approach to address this.

4   Equity beta

4.1   Systematic versus non-systematic risk

WACC theory holds that the cost of equity need only compensate investors for systematic risk. Investors are assumed to hold a diverse portfolio which allows them to diversify away non-systematic risk.

Most of the risks highlighted by networks as concerns or that may have increased in recent years are best characterised as non-systematic risks. Examples might include stranding risks due to the uptake

of new technologies, regulatory risks, or costs specific to networks rising at rates above CPI. Non-systematic risks cannot necessarily be ignored by the regulator, but they can be addressed through other elements of the revenue determination if appropriate.

4.2 Qualitative assessment of systematic risk

Systematic risk is also sometimes described as market risk and is usually characterised as risks that manifest across the economy, such as interest rate risk, exchange rate risk, recession, cost inflation risks and other economy-wide shocks.

The regulatory framework and the nature of networks' core business combine to give them very low exposure to risk in general and systematic risk in particular.

Interest rate risk has the potential to be a significant risk, given the relatively high gearing of the BEE. The risk however is mitigated by the cost of debt methodology, which sets a ten-year trailing average as a plausible proxy for the way a BEE might choose to finance. In practice it is unlikely and unnecessary that an efficient network business would be exposed to current interest rates on all of its debt finance.

Exchange rate risk should be very limited. The networks operate solely within Australia, so their revenue is collected entirely in Australian dollars. Their workforce and local suppliers will be payable in Australian dollars too. Some materials or specialist services may be procured from overseas providers and these may be priced in overseas currencies (though this may depend on the relative bargaining power of the parties). Finance is sometimes raised from overseas, but this need only be the case where it is cheaper than the local interest rates on which the determination is based, after allowing for the costs of hedging the currency risk. So, no allowance need be made for overseas currency financing costs.

The networks are highly recession-proof. Energy is a fundamental input to homes and businesses and while there may be a modest contraction in demand if there is a slowdown in economic activity, it will be lower than in most other industries. In any case, electricity networks are now subject to revenue caps for the provision of standard control services so are fully insulated from volume risk, whether due to systematic or non-systematic (e.g. the take-up of rooftop PV) factors. They are also substantially protected from bad debt risk, partly through the credit support provisions of the rules, but also through the retailer insolvency pass-through item. Gas networks are still subject to some volume risk as they are subject to price caps. The AER's proposal to set the same cost of capital implies that they do not consider this to add materially to the overall risk. If this, and/or any other systematic risk factors did represent a material difference in risk, then it should be addressed through setting a

different rate of return for such businesses rather than retaining the single rate of return decision and uplifting it to the riskiest type of business.

Cost inflation risks are substantially mitigated by the CPI-X form of revenue determination. While the specific mix of costs a regulated network business incurs may increase in cost faster or slower than general CPI, there is further mitigation through the opex and capex incentives, which share the upside or downside of cost outcomes with customers. Moreover, to the extent that certain cost drivers can be anticipated to be materially different from CPI, there is an opportunity to seek a cost escalation factor in the determination. Other cost shocks are more likely to be examples of non-systematic risk, but these too can be substantially mitigated by the pass-through and capex reopener provisions in the NER and NGR. Pass-through and reopeners are available for specific items that the costs or incidence of which are hard to forecast ex ante. The pass-through provisions allow the network businesses to propose their own-pass through items, meaning that they can be insulated from the cost impacts of outlier events such as terrorism and extreme weather.

Changes to the corporate tax rate are also addressed through the passthrough mechanisms in the NER and the NGR. The passthrough mechanisms do not remove all risk from the network business, but they cap their maximum exposure at 1 per cent of annual allowed revenue.

Other risks that have been articulated by the networks themselves can also be addressed through the regulatory framework. Where they can be identified as non-systematic risks, then that is more appropriate than addressing them via the rate of return. For example, *if* the AER determined that concerns around terminal value risk of the network warranted a regulatory adjustment, this would be better addressed through accelerated depreciation rather than as an increment to the cost of capital. One drawback, albeit minor, of the approach of having a single periodic assessment of the rate of return for all regulated networks is that the rate of return cannot be assessed holistically as part of an overall determination. Given the recent legislative change to implement a single binding rate of return decision, this option is unavoidably removed from the regulatory toolkit, and puts the onus more firmly on individual determinations as the locus of assessment about risk and for any risk mitigation to be implemented through means other than the rate of return. As the discussion above has shown, there is abundant risk mitigation in the basic structure of the regulatory determination already.

In short, the regulatory framework substantially insulates already low-risk businesses against a range of general and specific uncertainties. In this context, it is reasonable to expect beta to be relatively low, albeit a qualitative assessment such as this cannot in itself determine a numerical estimate. It does mean that there is no obvious reason that the AER should take the high end of the numerical

range derived from its quantitative analysis. Arguments from precedent, on this and other parameters are highly circular in nature and should not carry strong weight. In other words, the AER is entitled to exercise its judgment to set beta at a lower value than in previous decisions without being obliged to "prove" that the systematic risk faced by the BEE is lower than at the time of those previous decisions. Given that the previous decision was also an exercise of judgment, it is legitimate for the AER to arrive at a different judgment for this decision. The incremental nature of the change means that the AER's decision could not be classified as a capricious exercise of judgment.

4.3 Alternative quantitative assessment of risk

An interesting exercise for the AER or stakeholders to carry out (given we are at a late stage of the current guideline process, this is perhaps one for a future work program) would be to do a bottom up assessment of such risks in the context of the regulatory framework. Such exercises entail various assumptions and so are no more determinative than the empirical observations based on market data the AER currently uses but may support its decision. There is some precedent for investigating the volatility of cashflows in the regulated business. During the 2014-15 NSW distribution determination process, the AER carried out a cashflow analysis of the three electricity distribution businesses in NSW and commissioned an independent review of their analysis [3]. In this instance, however, the purpose was to assess the risk of insolvency if certain costs such as opex or interest rates turned out to be higher than the AER's proposal. The range of cashflow scenarios considered was governed more by the difference between the business's and the AER's assessment of the efficient level of these costs rather than an empirical review of the range of statistically likely outcomes. The AER's review of profitability may allow the collection of historical datasets that could be used to inform such an empirical review, which is another reason that this exercise may be better suited to a future work program.

In any case, given the dwindling number of directly relevant data points the AER has to measure beta from share prices and other publicly available market indicators, it would be worth considering how to diversify its evidence base for estimating beta in the future.

5 Overall cost of equity

5.1 Relevant sources of evidence

Given the challenges of accurately estimating the cost of equity components in the traditional CAPM, stakeholders have suggested a range of other data that they consider the AER could use. These include

dividend growth model (DGM), Fama French three factor model, RAB multiples, and international regulatory decisions. These are canvassed below, along with consideration of the networks' likely equity raising requirements.

5.1.1 Dividend Growth Model and Fama French three factor model

There has been perennial consideration of the relevance of both of these models to determining the cost of equity of the BEE. Concerns have centred around both their theoretical underpinnings and the quality of the empirical evidence. In the context of these guideline process, the AER has written that: "we have diminished confidence in the robustness of DGMs" and confirmed at the Fama-French three factor model pays no role in their decision [4].

We do not consider that the AER's treatment of the available evidence from these models materially weakens the quality of their decision-making in the draft determination. However, capital theory is not static: theories get refined and sometimes validated over time, and in different circumstances the quality of the empirical evidence may improve. Accordingly, we consider that the AER should keep an open mind with regard to these models in future Rate of Return determination processes.

5.1.2 RAB multiples

Another point regularly raised in network regulatory processes is the persistence over several years and across several businesses of RAB multiples greater than one, i.e. enterprise values that exceed the value of the RAB. This can be observed both via the share prices of listed entities and transaction values for unlisted entities. Raw RAB multiples do not necessarily account for the existence of positive cashflows from alternate control services and unregulated services carried out by the same corporate entity, however when multiples are well in excess of one, it does not seem plausible that these alone could account for the additional value. Stakeholders who have raised this issue have inferred that these RAB multiples are evidence of previous regulatory determinations having allowed for returns in excess of that required by a BEE. Even if this was the case, disaggregating the impact of outperformance on, say, opex or tax, from outperformance due to an unduly generous rate of return is extremely challenging. The AER's proposed development of profitability metrics may inform this debate, but even that is unlikely to do so in a determinative way. Assessing ex post outcomes does not definitively answer the question of whether ex ante determinations were unduly generous, given the limited number of *independent* data points.

Accordingly, it is difficult to see how the AER can use the existence of RAB multiples as a direct input to the rate of return determination. As set out in section 3.1.1, RAB multiples do have an impact in

that a difference between the RAB and the enterprise value creates a difference between the gearing level that is relevant for the purposes of assessing credit ratings (Debt/RAB) and the gearing level based on the AER's definition of gearing (debt/Enterprise Value). They are also a factor in differences between the tax payable assumptions in the PTRM and tax actually paid by the networks, but this issue is being addressed as part of the AER's review of regulatory tax approach.

5.1.3 International benchmarks

Network stakeholders have argued that the rate of return should be comparable to that set for regulated networks in overseas jurisdictions and have cited some recent decisions where the returns are higher than in the draft determination. The logic is presumably that global capital will gravitate towards the superior returns. In practice there are clearly limits to this - otherwise capital would flood into the countries with the highest risk-free rates. Currency risk, tax differences and capital controls all play a role in limiting the global equalisation of risk-adjusted returns. In any case, it is not a given that Australian networks face the same risk profile as those in other countries. Regulatory frameworks are not uniform, and there may also be factors that affect the underlying business risks between networks in different countries, despite their ostensibly carrying on the same business. Accordingly, international benchmarks are not relevant to the AER's decision -making. This applies either way – if the AER was setting higher rates of return than overseas regulators, it would not inherently follow that the AER was wrong.

5.2 Equity raising requirements

An additional consideration in assessing the return on equity is the extent to which the networks are likely to need to raise new equity from the markets. While the rate of return needs to be adequate either way, if they needed to raise equity regularly, then that would support the cost of equity being set in a way that reflects current equity market conditions. Conversely, if they are unlikely to need to rise equity frequently, then they have some latitude to pick their timing and raise equity only when conditions are favourable. In this case a stable long-term view of equity is more appropriate, noting that "stable" in this context does not mean parameter values cannot change between reviews.

5.2.1 Limited evidence of actual requirements to raise equity

At the extreme end of the spectrum an analysis of Queensland networks such as Energex and Powerlink suggest they have not needed to raise equity in 15 years, despite their RABs growing by four times [5]. Given the rate of return is set on the presumption that the BEE is a privately owned and

financed business it is more relevant to look at the equity raising of the privately-owned networks. Several of these passively raise modest amounts of capital by default each year through dividend reinvestment plans. Active equity raising is less common, aside from when acquisitions need to be funded. Spark, the investment vehicle for CitiPower, Powercor and SA Power Networks raised $405m in 2015 to fund its acquisition of a share of TransGrid. Prior to that it raised $246m in 2014 and converted $295m of loan notes to equity in 2010. Ausnet raised $427m in 2013 and $399m in 2010. Envestra raised $219m in 2013 and $111m in 2009. Of the 2013 equity raising, it noted that "this program could have been financed through debt…" [5]. DUET raised $1,880m in 2016 for the acquisition of Energy Developments Ltd and a 20 per cent share of the Dampier Bunbury pipeline. It also raised $409m in 2015. In other words, aside from funding specific acquisitions, the private networks went to the equity markets approximately once in each price control period.

5.2.2 Equity raising in the PTRM

The virtual network described in section 3.1.1 above can also be used to illustrate the limited equity requirement of a typical network going forward. In the simplified PTRM, and assuming the 83 per cent dividend payout ratio set out in the draft determination as part of the estimation of gamma, the equity component required to fund the capex program while maintaining debt at 60 per cent of RAB is $21m (on an opening equity value of $400m). Assuming a 30 percent dividend reinvestment take-up, as the AER had done in previous PTRMs, this can easily be covered without going to the market for an active injection of equity. The figures are set out in Appendix A.

6 Generic parameters

6.1 Risk free rate

As the AER notes, "the use of the annualised yield from the 10-year Commonwealth Government Securities (CGS) to calculate the risk-free rate is not contentious" [6]. Given the longer-term nature of the main sources of evidence for other key parameters such as the cost of debt (10-year trailing average) and market risk premium (Historical excess returns over decades or more), the short-term averaging period for determining the specific risk-free rate to apply to each determination is a little anomalous. Conversely, it may be seen as ensuring that the latest capital market conditions are somewhat reflected in the rate of return, given that it will apply to each network business for a future five-year period. Given the actual rate of return will fluctuate year on year due to the updating of the cost of debt formula, this near-term forward-looking approach could be extended to re-basing the

risk-free rate annually, which would give this parameter even greater currency through the five-year period. The downside is that it makes the annual allowed revenue less predictable, by adding another variable term in. This could hamper retailers' and customers' ability to assess pricing on a longer-term basis. Accordingly, on balance, the AER's approach appears reasonable. It's not clear that the proposed option of allowing the business to nominate a period between 20 and 60 days enhances outcomes and thus appears to be an unnecessary additional element of complexity.

6.2 Market risk premium

The AER has consistently put the greatest weight on calculations of historical excess returns to the share market. The main point of contention has been whether the geometric mean returns are an appropriate consideration as a counterbalance to the likelihood that arithmetic returns overstates the actual market risk premium. Additionally, the results vary with the period under consideration. The draft determination's parameter estimates of 6 is within the bounds of the range suggested by arithmetic returns and higher than the range suggested by geometric returns. It is also consistent with the ranges suggested by some of the other sources of evidence, such as expert surveys, albeit it is low if considered in the context of estimates derived from the DGM. While arguably not as generous as it could be, it does not appear to be an unreasonable estimate on the evidence.

6.3 Gamma

The AER's draft determination incorporates a gamma of 0.5, which is derived from a point estimate of a distribution rate of 0.83 and a utilisation rate of 0.6 (previously, the AER had arrived at a similar gamma using 0.7 for each of these). We note the expert advice to the AER that stated that their estimate was for a distribution rate of *at least* 0.83 and a utilisation rate of *at least* 0.6. On their own expert's analysis, then, the AER's decision is somewhat conservative. We note that there are conceptual disagreements over whether the utilisation rate should account for non-domestic investors, given that otherwise the utilisation rate of a BEE would be 1. Given that in reality, foreign investment is a feature of the Australian share market and of the unlisted sector, the AER's decision to estimate the utilisation rate at less than 1 is pragmatic. Given this, then the challenges of accurately determining this parameter are significant, noting concerns raised around the appropriateness of using ATO data. On the distribution side, the evidence certainly supports a high distribution rate, given the low-risk nature of regulated network businesses. There is an element of feedback with equity requirements. For consistency, the distribution rate used to estimate gamma should also be that used in the PTRM to determine cashflow requirements and thus equity raising requirements. IT also

influences financial metrics, so to the extent these are used as a cross check on the benchmark credit rating, then it is relevant. With this in mind, an element of conservatism may be appropriate.

7   Appendix 1 Development of a virtual network PTRM

As explained above, there is a drawback to the AER's setting of the Rate of Return for all businesses in a sperate process from their revenue determinations. It means that the implications of the allowed Rate of Return cannot be tested against specific network determinations. Accordingly, the analysis of the creditworthiness of a network under the Rate of Return draft determination has had to be carried out using a representative "virtual" network. The development of this virtual network and the calculation of its financial metrics was carried out as follows:

7.1   Set up an adapted PTRM

A recent PTRM was taken: the TasNetworks 2017-19 -Post tax revenue model so that the calculations in it were up to date. Several elements of the model extraneous to the basic calculations were removed. The equity raising costs of 3 per cent/1 per cent for dividend reinvestment plan were maintained.

7.2   Determine input parameters – WACC

The WACC parameters were derived from the Draft Determination. Where the determination describes a formula rather than a single value, a value was used that approximates to the most recent value as per the Draft Determination. These are shown in Table 5 below.

Table 5: WACC input parameters for virtual PTRM

Parameter	Value used
Equity beta	0.6
Market risk premium	6 per cent
Equity risk premium	360 basis points
Risk free rate	2.8 per cent
Gearing ratio	60 per cent
Return on debt	4.5 per cent
Distribution Rate	83 per cent
Utilisation rate	60 per cent

7.3 Determine input parameters – other

The key financial ratios the model is testing for are not affected by the absolute quantum of PTRM values such as the RAB, capex, opex and depreciation. What matters is the relativities. Accordingly, an arbitrary value for the opening RAB of $1bn was selected. Other key parameters were determined in ratio to the RAB. The ratios were based on the average for electricity distribution businesses in their most recent revenue determinations.

Table 6: Other parameter ratios

Parameter	Ratio
Tax asset base /RAB	74.1%
Depreciation/RAB	5.0%
Tax depreciation/TAB	4.6%
Capex/RAB	7.5%
Opex/RAB	5.1%

For simplicity, the RAB is treated as a single asset (as is the Tax asset base), and capex and opex are kept constant in real terms across the five years. No customer contributions, disposals or adjustments to revenue due to incentive schemes were assumed. No revenue smoothing was carried out.

7.4 Financial ratios

Several key financial ratios like those used by credit ratings agencies were added. These were calculated as follows:

Funds From operations (FFO) = Revenue – opex- interest

Adjusted FFO = FFO – depreciation

Retained Cash flow (RCF) = FFO – tax – dividends

7.5   Results

The input parameters and full results can be found in the spreadsheet at Attachment A. The summary results are as follows:

7.5.1   Key financial ratios

The key financial ratios used by Moody's include net debt/RAB (held constant at the chosen gearing ratio of 60 per cent in the PTRM), RCF/net debt, FFO + interest/interest and FFO/net debt. The PTRM produced ratio values as follows:

FFO + interest/interest	3.0
RCF/net debt	7%
FFO/net debt	9%

Note: see Analysis worksheet, rows 183-185 in Attachment A. These are consistent across a five-year period, due to holding capex and opex constant in real terms and holding gearing constant. They are used in assessing the credit rating of the virtual network as set out in Appendix B.

7.5.2   Equity requirements

The equity requirement for the virtual network is around $20m over five years (see cell Q41 in the Equity Raising Costs worksheet of Attachment A). This is 2 per cent of the opening RAB. It would be unusual for a network business to hold an equity raising for this amount of equity - the smallest amount raised in the period reviewed in section 5.2.1 above was $111m. Other options for financing this amount include:

- Dividend reinvestment plan – a take-up rate of around 40 per cent would be sufficient to cover this amount.
- Additional debt raising - this would raise the debt gearing level to 61.2 per cent by the end of the five years and so would have a very small effect on the financial ratios. As Table 2 above shows, actual gearing levels for the private networks fluctuate much more widely than this without impacting credit ratings.

8 Appendix 2 Credit rating evaluation of a BEE using Moody's methodology

Moody's has the most transparent methodology of the three major ratings agencies [9]. In practice, ratings evaluation involves judgement on the part of the ratings analysts, and so the process of assigning a credit rating cannot be mechanistically replicated. Nonetheless, the methodology is sufficiently clear to allow others to make an estimate of a likely credit rating for a regulated business based on the regulatory framework and some key financial ratios.

Moody's assesses regulated energy businesses based on ten weighted factors, as set out below:

Table 7: Factors and weightings

Factors	%
Stability and Predictability of Regulatory Regime	15
Asset Ownership Model	5
Cost and Investment Recovery (Ability and Timeliness)	15
Revenue Risk	5
Scale and Complexity of Capital Program	10
Financial Policy	10
FFO + interest/interest	10
net debt/RAB	12.5
FFO/net debt	12.5
RCF/net debt	5
	100

Source: Moody's.

Each factor is then assigned its own score, using the same notation as Moody's overall ratings scores:

Rating	Score
Aaa	1
Aa	3
A	6
Baa	9
Ba	12
B	15
Caa	18

As the scoring is not linear, a single weak factor can pull down the overall assessment. The scores are then multiplied by the weightings to give an overall score, which is then assigned a rating. The scores and ratings are shown with the Fitch/S&P equivalent ratings for comparison in Table 8.

Table 8: Overall ratings

Grid-Indicated Rating	Aggregate Weighted Total Factor Score	S&P/Fitch equivalent
Aaa	x < 1.5	AAA
Aa1	1.5 ≤ x < 2.5	AA+
Aa2	2.5 ≤ x < 3.5	AA
Aa3	3.5 ≤ x < 4.5	AA−
A1	4.5 ≤ x < 5.5	A+
A2	5.5 ≤ x < 6.5	A
A3	6.5 ≤ x < 7.5	A−
Baa1	7.5 ≤ x < 8.5	BBB+
Baa2	8.5 ≤ x < 9.5	BBB
Baa3	9.5 ≤ x < 10.5	BBB−
Ba1	10.5 ≤ x < 11.5	BB+
Ba2	11.5 ≤ x < 12.5	BB
Ba3	12.5 ≤ x < 13.5	BB−
B1	13.5 ≤ x < 14.5	B+
B2	14.5 ≤ x < 15.5	B
B3	15.5 ≤ x < 16.5	B−
Caa1	16.5 ≤ x < 17.5	CCC+
Caa2	17.5 ≤ x < 18.5	CCC
Caa3	18.5 ≤ x < 19.5	CCC−

Source: Moody's.

Moody's may then adjust up to two notches for specific factors such as structural enhancements incorporated in the licence, corporate structure or through financial arrangements. No attempt to apply such an uplift has been carried out for this exercise, but in practice some network businesses may benefit from such an uplift.

8.1   Assessment of Ratings for a BEE using the virtual PTRM

This section sets out an indicative assessment of the credit rating that would be applicable to a BEE, taking account of the regulatory regime and the financial ratios derived from the virtual network PTRM described in Appendix A (and see also Attachment A). Table 9 below shows the criterion for the selected score for each factor as well as the criterion for one notch above and one notch below for reference, as well as an explanation of why this was chosen.

Table 9: Ratings assessment

Factor	One notch higher	Selected score	One notch lower	Score	Rationale
Stability and Predictability of Regulatory Regime	Regulation is independent, well established (> 15 years of being predictable and stable) and transparent. These conditions are expected to continue.	Regulation is independent, well established (> 10 years of being predictable and stable) and transparent. These conditions are expected to continue.	Regulation is generally independent and developed. These conditions are expected to continue.	Aa	Highly stable regulatory regime that has been in place for a decade. AER is independent and carries out a highly transparent process. These conditions are expected to continue.
Asset Ownership Model	All key T&D assets held outright in perpetuity.	All key T&D assets held outright under licence/long term concession with clearly defined right to timely recovery of residual asset value.	All key T&D assets held under long-term concession with clearly defined right to timely recovery of residual asset value/ medium-long term operating leases with very high renewal rate.	Aa	Outright ownership or long term lease the norm. Licensing regime in place. Strong rights to recovery of asset value via RAB.
Cost and Investment Recovery (Ability and Timeliness)	Tariff formula is expected to allow for timely recovery of operating expenditure, depreciation and a fair return on investment. Capex included in asset base as incurred.	Tariff formula is expected to allow for recovery of operating expenditure including depreciation based on allowances set a frequent price reviews (<=5-yearly intervals) and a fair return on investment. Capex included in asset base as incurred. Opex and capex subject to efficiency tests.	Tariff formula is expected to allow for recovery of operating expenditure including depreciation and return on investment but subject to retrospective regulatory approach or > 5-year price reviews. Some instances of revenue backloading expected.	A	5-year price reviews, negligible risk of incurred expenses being disallowed, reopeners for material changes in cost.

Factor	One notch higher	Selected score	One notch lower	Score	Rationale
Revenue Risk	No exposure to volume risk.	Very low exposure to volume risk. Revenue cap mechanism with timely recovery in place and stable volumes expected.	Limited exposure to volume risk. Revenue cap in place with some volatility in volumes expected or hybrid price/revenue ca with low volatility in volumes.	Aa	Electricity networks on revenue cap, gas on price cap, but gas networks estimate volumes for determining price cap, and some discretion to price to elasticity, so should be able to manage risk.
Scale and Complexity of Capital Program	4-6%	6-8%	8-12%	A	Capex average of sampled network businesses around 7.5% of RAB on average (see Appendix A)
Financial Policy	Long track record and expected maintenance of a conservative financial policy; stable metrics' lower than industry average debt levels.	Extended track record and expected maintenance of a conservative financial policy; moderate debt leverage and a balance between creditors and shareholders. Not likely to take actions that could lead to a weaker credit profile.	Track record and expected maintenance of a conservative financial policy; an average level of debt for the industry. Some risk that distributions or acquisitions could lead to a weaker credit profile.	A	This factor is more company-specific than the others (except the financial ratios) but reasonable to assume a BEE would have a conservative financial policy. PTRM shows stable metrics despite high distribution rate.
FFO + interest/interest	4-5.5	2.8-4	1.8-2.8	Baa	from virtual network PTRM
net debt/RAB	30-45%	45-60%	60-75%	A	60% per draft guideline (and held constant in PTRM
FFO/net debt	11-18%	5-11%	0-5%	Ba	9% per virtual network PTRM
RCF/net debt	14-21%	7-14%	1-7%	Baa	7% per virtual network PTRM

Source: Moody's (edited for relevance and brevity), internal analysis

Table 10 below summarises these assessments and adds the weightings to determine an overall score of Baa1 (i.e. BBB+) in line with AER's selected credit rating for the purposes of estimating the cost of debt.

Table 10: Summary of ratings assessment

Weightings	%	Assessment	Score	Weighted Score
Stability and Predictability of Regulatory Regime	15	Aa	3	0.45
Asset Ownership Model	5	Aa	3	0.15
Cost and Investment Recovery (Ability and Timeliness)	15	A	6	0.9
Revenue Risk	5	Aa	3	0.15
Scale and Complexity of Capital Program	10	A	6	0.6
Financial Policy	10	A	6	0.6
FFO + interest/interest	10	Baa	9	1.035
net debt/RAB	12.5	A	6	0.75
FFO/net debt	12.5	Ba	12	3
RCF/net debt	5	Baa	9	0.5175
	100	**Baa1**		**8.1525**

9 Bibliography

[1] Independendent Panel, "Review of the Australian Energy Regulator's Rate of Return Draft Guidelines," 2018.

[2] Moody's Investor Services, "Rating Methodology: Regulated Electric and Gas Networks," 2017.

[3] Moody's Investor Services, "Outlook for Australian infrastructure is stable in 2018," 2017.

[4] RSM Bird Cameron, "Indepedent review of the AER's internal cash flow analysis of insolvency risk for NSW electricity service providers for the regulatory period 2014-19," 2015.

[5] AER, "Draft Rate of Return Guidelines Explanatory Statement," 2018.

[6] H. Grant, "The Winners and Losers of the Monopoly Game," 2018.

[7] Envestra, "Annual Report," 2013.

[8] AER, "Discussion Paper, Market Risk Premium, risk free rate averaging period and automatic application of the rate of return," 2018.

[9] Moodys Investor Services, "Regulated Electric and Gas Networks Rating Methodology," 2017.

4