



Better Regulation

Rate of Return Guideline

December 2013

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1 Overview

The AER's Better Regulation program involves the publication of several guidelines. Under the new rules, the rate of return guideline (the guideline) sets out the AER's approach to determining the allowed rate of return in accordance with the NEL and the NGL (collectively, the law and rules).

The new rules require the AER to set out in the guideline:¹

- the methodologies the AER proposes to use
- the estimation methods, financial models, market data and other evidence the AER proposes to take into account.

The major elements the AER has proposed in this guideline include:

- Considering a broader range of material in arriving at a point estimate for the expected return on equity. The AER proposes to continue to use the Sharpe–Lintner CAPM for estimating a starting point and a range for the expected return on equity. However, the AER proposes to use the theory of the Black CAPM and dividend growth model outputs to inform the input parameters the AER uses to estimate the expected return on equity using the Sharpe–Lintner CAPM. The AER also proposes to have regard to other information, including the estimated return on equity from the Wright approach, valuation and broker reports, and other regulators. Where appropriate, this information may lead the AER to select an estimate of the expected return on equity that differs from the output of the Sharpe–Lintner CAPM.
- Changing from the current 'on the day' approach to a trailing average portfolio approach for estimating the return on debt. The trailing average will be calculated using a simple 10 year average and will be updated annually. The yearly average will be calculated over a period of 10 or more consecutive business days using yield estimates from an independent third party service provider for a 10 year debt term and the closest proximate for a BBB+ credit rating. There will be a 10 year transition period from the current 'on the day' approach to the trailing average portfolio approach.
- Considering a broader range of material to inform the estimation of the value of imputation credits.

1.1 Structure of the guideline

There are seven main parts to this guideline:

- Chapter two outlines the AER's application of criteria that the AER proposes to use to assess the merits of the various sources of information in setting the allowed rate of return.
- Chapter three outlines the AER's definition of the benchmark efficient entity and compensation for risk.
- Chapter four outlines the AER's approach to estimating the overall rate of return.
- Chapter five outlines the AER's approach to estimating the expected return on equity. This includes using the Sharpe–Lintner CAPM as the foundation model, and then having regard to other relevant material to arrive at a final point estimate of the expected return on equity.

¹ NER, cls. 6.5.2(n) and 6A.6.2(n); NGR, r. 87(14).

- Chapter six outlines the AER's approach to estimating the return on debt. This includes using a 10 year trailing average for estimating the return on debt, with annual updates. The transitional arrangements from the on the day approach to the trailing average approach are also outlined.
- Chapter seven outlines the AER's approach to estimating imputation credits.

1.2 Process for revision

The AER may amend or replace these guidelines from time to time in accordance with the consultation procedures under clauses 6.16 and 6A.20 of the NER and rule 9B of the NGR.²

² NER, cls. 6.2.8(e) and cl. 6A.2.3(e); NGR, r. 87(17).

2 Application of criteria

This chapter sets out the criteria that the AER proposes to use to assess the merits of the various sources of information in setting the allowed rate of return.

The AER considers decisions on the rate of return are more likely to be consistent with the allowed rate of return objective if they use estimation methods, financial models, market data and other evidence that are:

- (1) where applicable, reflective of economic and finance principles and market information
 - (a) estimation methods and financial models are consistent with well accepted economic and finance principles and informed by sound empirical analysis and robust data
- (2) fit for purpose
 - (a) use of estimation methods, financial models, market data and other evidence should be consistent with the original purpose for which it was compiled and have regard to the limitations of that purpose
 - (b) promote simple over complex approaches where appropriate
- (3) implemented in accordance with good practice
 - (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets
- (4) where models of the return on equity and debt are used these are
 - (a) based on quantitative modelling that is sufficiently robust as to not be unduly sensitive to errors in inputs estimation
 - (b) based on quantitative modelling which avoids arbitrary filtering or adjustment of data, which does not have a sound rationale
- (5) where market data and other information is used, this information is
 - (a) credible and verifiable
 - (b) comparable and timely
 - (c) clearly sourced
- (6) sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.

3 Benchmark efficient entity and compensation for risk

This chapter sets out the AER's definition of the benchmark efficient entity. The definition of the benchmark efficient entity has implications for the estimated return on debt and equity (including the choice of data and models used to estimate the return on equity and debt).

3.1 Objective

The benchmark efficient entity is defined so that the allowed rate of return estimated for that benchmark efficient entity provides service providers with a reasonable opportunity to recover at least their efficient financing costs, consistent with the national electricity objective (NEO), national gas objective (NGO) and revenue pricing principles (RPP).³

3.2 Rule requirements

Clauses 6.5.2(c) and 6A.6.2(c) of the NER and rule 87(2)(3) of the NGR set out the allowed rate of return objective. The allowed rate of return objective requires the AER to set the rate of return for a distribution or transmission service provider, which is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the distribution or transmission service provider in respect of the provision of regulated services.

3.3 Application

The AER's proposed conceptual definition of the benchmark efficient entity is a pure play, regulated energy network business operating within Australia.

In estimating the return on equity, the benchmark is applied to comparable entities which are then used to estimate the equity beta (see section 5.3.3). The equity beta, in turn enters the Sharpe–Lintner CAPM model, which is used as the foundation model for estimating the return on equity (see section 5.3.3).

In estimating the allowed return on debt, the definition of the benchmark efficient entity is applied to inform the choice of comparable entities which are used to estimate:

- the benchmark gearing ratio (see section 4.3.2)
- the benchmark credit rating (see section 6.3.3)
- the benchmark debt term (see section 6.3.3).

³ NEL, ss. 7 and 7A; NGL, ss. 23 and 24.

4 Overall rate of return

This chapter sets out the AER's proposed approach to estimating the overall rate of return for service providers.

4.1 Objective

The overall rate of return is to be set such that it achieves the allowed rate of return objective. This requires that the AER set a rate of return which reflects the efficient financing costs of a benchmark efficient entity. The benchmark efficient entity is to be subject to a similar degree of risk in providing regulated services as the service provider which is subject to the determination.

Together with the other building block components, the estimate of the overall rate of return is to be set such that:

- it promotes efficient investment in, and efficient operation and use of, electricity and natural gas services for the long term interests of consumers⁴
- a regulated network 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 its regulatory obligations.⁵

4.2 Rule requirements

Clauses 6.5.2(d) and 6A.6.2(d) of the NER and rule 87(4) of the NGR specify two elements which the AER is to apply in estimating the allowed rate of return.

The first element, provided by clauses 6.5.2(d)(1), and 6A.6.2(d)(1) of the NER and rule 87(4)(a) of the NGR, requires that the AER apply a weighted average of:

- the return on equity for the regulatory control period in which that regulatory year occurs
- the return on debt for that regulatory year.

The second element provides that the AER must use a nominal vanilla basis to calculate the allowed rate of return, and that this is consistent with the estimate of value of imputation credits.⁶ In arriving at the allowed rate of return, the rules require that the AER has regard to:⁷

- relevant estimation methods, financial models, market data and other evidence;
- the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and
- any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

⁴ NEL, s. 7; NGL, s. 23.

⁵ NEL, s. 7A; NGL, s. 24.

⁶ NER, cls. 6.5.2(d)(2) and 6A.6.2(d)(2); NGR, r. 87(4)(b).

⁷ NER, cls. 6.5.2(e) and 6A.6.2(e); NGR, r. 87(5).

4.3 Application

This section describes how the overall rate of return is proposed to be estimated. This involves the following:

- applying a nominal post-tax model
- calculating the weighted average cost of capital (WACC) using a vanilla WACC formula
- applying intra-period adjustments of the WACC

4.3.1 Applying a nominal post-tax model

The AER proposes to continue to apply a post-tax revenue model (PTRM) to fulfil the rule requirements to apply a nominal post-tax framework.⁸

The PTRM accommodates the use of a nominal vanilla WACC for calculating the rate of return.⁹ The treatment of tax enters the PTRM via the cash flows. It is therefore consistent with the use of a nominal vanilla WACC for calculating the rate of return and consistently incorporates the estimate of the value of imputation credits.

4.3.2 Calculating the weighted average cost of capital using a vanilla WACC formula

The AER proposes to calculate the WACC by applying the following vanilla WACC formula:

$$WACC_{vanilla} = E(k_e) \frac{E}{V} + E(k_d) \frac{D}{V}$$

where:

- $E(k_e)$ is the expected required return on equity
- $E(k_d)$ is the expected required return on debt
- $\frac{E}{V}$ is the proportion of equity in total financing (comprising equity and debt).
- $\frac{D}{V}$ is the proportion of debt in total financing, and is equal to the AER's proposed benchmark efficient entity gearing ratio of 0.6.

4.3.3 Intra-period adjustment of the WACC

The AER proposes to update the overall rate of return annually. This is a result of the allowed return on debt being updated annually.

The AER proposes to set the expected return on equity for the duration of the regulatory control period.

⁸ NER, cls. 6.4.2, 6.4.3, 6A.5.3, and 6A.5.4; NGR rr. 76 and 87A.

⁹ NER, cls. 6.5.2(d)(2) and 6A.6.2(d)(2); NGR, r. 87(4)(b).

4.3.4 Arriving at point estimates or ranges

The overall rate of return is a point estimate, reflecting the use of a point estimate for the allowed return on debt and the expected return on equity.

5 Return on equity

This chapter sets out the AER's proposed approach to estimating the expected return on equity. The AER proposes a six step approach to determine an estimate of the expected return on equity that contributes to an overall rate of return that achieves the allowed rate of return objective. These steps are explained below, and are summarised in figure 5.1.

5.1 Objective

The expected return on equity must be estimated such that it contributes to the achievement of the allowed rate of return objective. It should therefore provide compensation to a service provider for the equity financing cost which is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk.

5.2 Rule requirements

Clauses 6.5.2(f), 6.5.2(g), 6A.6.2(f) and 6A.6.2(g) of the NER, and rules 87(6) and 87(7) of the NGR specify that:

- the return on equity for a regulatory control period must be estimated such that it contributes to the achievement of the allowed rate of return objective
- in estimating the return on equity, regard must be had to the prevailing conditions in the market for equity funds.

The allowed rate of return objective is that:¹⁰

- the rate of return for a service provider 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 developing a guideline that estimates the expected return on equity in accordance with the allowed rate of return objective, the AER has had regard to, among other things, relevant estimation methods, financial models, market data and other evidence.¹¹

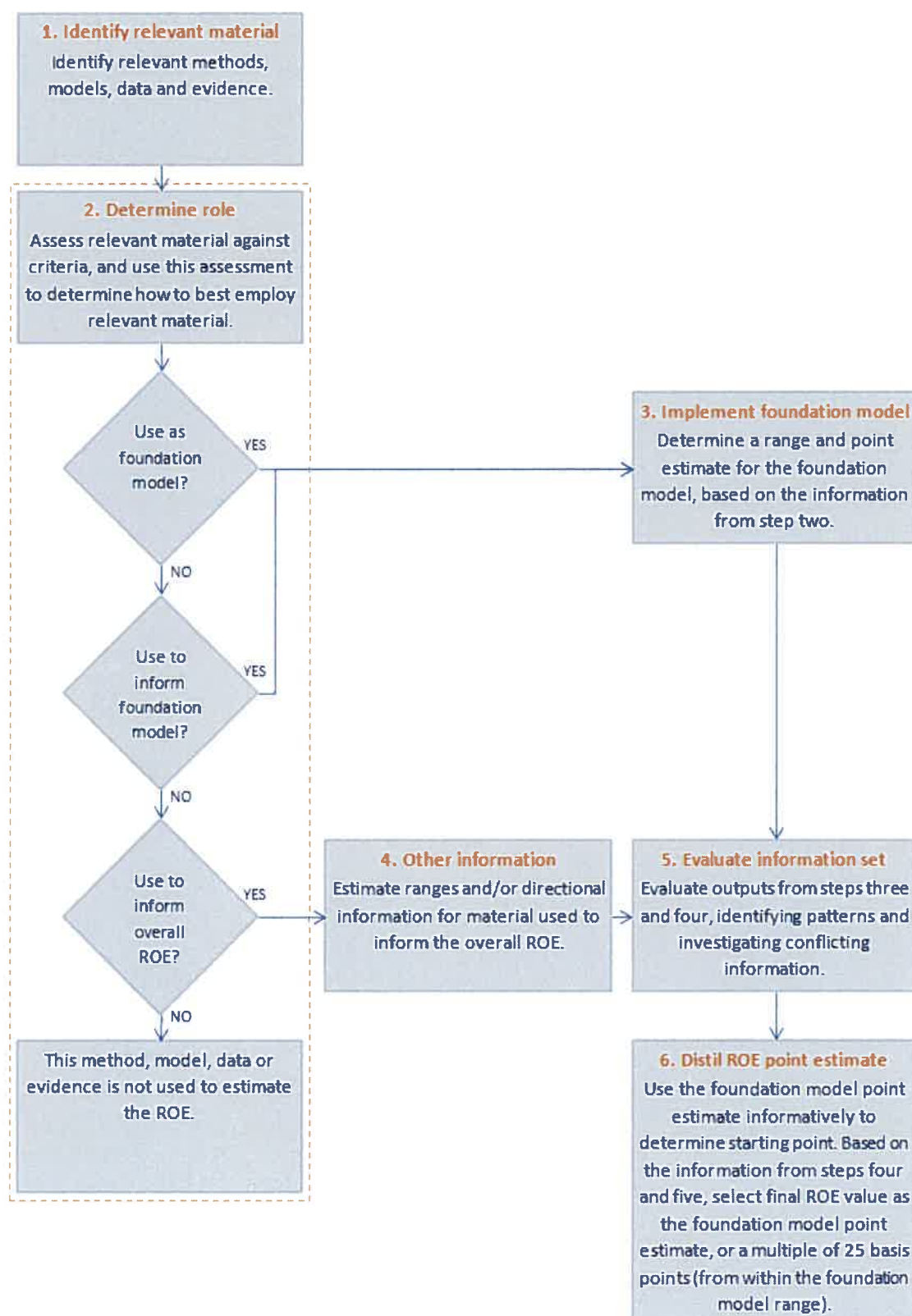
5.3 Application

The AER proposes to estimate the expected return on equity using the approach summarised in figure 5.1.

¹⁰ NER, cls. 6.5.2(c) and 6A.6.2(c); NGR, r. 87(3).

¹¹ NER, cls. 6.5.2(e)(1) and 6A.6.2(e)(1); NGR, r. 87(5)(a).

Figure 5.1 Flowchart of the AER's proposed approach to estimating the expected return on equity



Source: AER analysis.

5.3.1 Step one: identify relevant material

The AER's first step proposes to identify the relevant material that may inform the estimate of the expected return on equity. The material identified by the AER as relevant is outlined in the explanatory statement to this guideline, and in table 5.1 and table 5.2 of this guideline.

5.3.2 Step two: determine role

The AER's second step proposes to assess the relevant material identified in step one against the AER's assessment criteria. The purpose of this assessment is to identify what role the AER proposes relevant material to play in estimating the expected return on equity. The AER proposes to use each piece of relevant material only once (to the extent practicable), in one of four ways:

- (1) As the foundation model.
- (2) To inform the estimation of parameters within the foundation model.
- (3) To inform where within the return on equity range (set by the foundation model) the final point estimate of the expected return on equity should fall.
- (4) Not used to estimate the expected return on equity.

The AER undertook an assessment of the relevant material identified in step one against the assessment criteria. The AER assessed models and other relevant material. The detailed assessment is outlined in the explanatory statement to this guideline.

The outcome of the AER's model assessment is outlined in table 5.1.

Table 5.1 Role of relevant models

Material (step one)	Role (step two)
Sharpe–Lintner CAPM	Foundation model
Black CAPM	Inform foundation model parameter estimates (equity beta)
Dividend growth models	Inform foundation model parameter estimates (market risk premium)
Fama–French three factor model	No role

Source: AER analysis.

The outcome of the AER's assessment of other relevant information is outlined in table 5.2.

Table 5.2 Role of other information

Material (step one)	Role (step two)
Commonwealth government securities	Inform foundation model parameter estimates (risk free rate)
Observed equity beta estimates	Inform foundation model parameter estimates (equity beta)
Historical excess returns	Inform foundation model parameter estimates (MRP)
Survey evidence of the MRP	Inform foundation model parameter estimates (MRP)
Implied volatility	Inform foundation model parameter estimates (MRP)
Other regulators' MRP estimates	Inform foundation model parameter estimates (MRP)
Debt spreads	Inform foundation model parameter estimates (MRP)
Dividend yields	Inform foundation model parameter estimates (MRP)
Wright approach	Inform the overall return on equity
Takeover and valuation reports	Inform the overall return on equity
Brokers' return on equity estimates	Inform the overall return on equity
Other regulators' return on equity estimates	Inform the overall return on equity
Comparison with return on debt	Inform the overall return on equity
Trading multiples	No role
Asset sales	No role
Brokers' WACC estimates	No role
Other regulators' WACC estimates	No role
Finance metrics	No role ¹²

Source: AER analysis.

5.3.3 Step three: implement foundation model

The AER's third step proposes to use the Sharpe–Lintner CAPM as the foundation model. The AER proposes to implement the Sharpe–Lintner CAPM as follows:

¹² Finance metrics may play a role in future AER decisions. However, at this stage the AER has not formed a view on how these tests should be applied. Therefore, these tests are not included in this final guideline.

- The Sharpe–Lintner CAPM is estimated by adding to the risk free rate the product of the equity beta and market risk premium (MRP).
- The range and point estimate for the expected return on equity is calculated based on the range and point estimates from the corresponding input parameters. For example, the lower bound of the expected return on equity range is calculated by applying the point estimate for the risk free rate and the lower bound estimates of the equity beta and MRP. A probability will not be assigned to values within the range, but it will not be assumed that all values within the range are equally probable.

The AER proposes to estimate the input parameters for the Sharpe–Lintner CAPM as follows:

Risk free rate

The AER proposes to adopt a forward looking risk free rate that is commensurate with prevailing conditions in the market for funds at the commencement of the regulatory control period.

On the risk free rate proxy, the AER proposes to adopt:

- the yield on CGS
- a 10 year term.

On the risk free rate averaging period, the AER proposes to adopt a period that:

- is short—specifically, 20 consecutive business days in length
- is as close as practicably possible to the commencement of the regulatory control period.

Equity beta

The AER proposes to estimate a range for the equity beta, and then select a point estimate for the equity beta from within that range.

The AER proposes to adopt the same point estimate and range for equity beta across each of the energy sectors the AER regulates (electricity transmission, electricity distribution, gas transmission and gas distribution).

Under the AER's approach, the AER proposes to estimate the range for the equity beta based on empirical analysis using a set of Australian energy utility firms the AER considers reasonably comparable to the benchmark efficient entity. This approach leads to a range for equity beta from 0.4 to 0.7.

The AER then proposes to use other information sources to inform the selection of a point estimate from within the empirical range of equity beta estimates. This additional information includes:

- empirical estimates of overseas energy networks.
- the theoretical principles underpinning the Black CAPM.

This approach leads to a point estimate of 0.7 for equity beta, chosen from within the range 0.4 to 0.7.

Market risk premium

The AER proposes to estimate a range for the MRP, and then select a point estimate from within that range.

The AER proposes to estimate the range for the MRP with regard to theoretical and empirical evidence—including historical excess returns, dividend growth model estimates, survey evidence and conditioning variables. The AER will also have regard to recent decisions among Australian regulators. Each of these sources of evidence has strengths and limitations.

The AER proposes to estimate the point estimate for the MRP based on the AER's regulatory judgement, taking into account estimates from each of those sources of evidence and considering their strengths and limitations.

5.3.4 Step four: other information

The AER's fourth step proposes to estimate ranges, directional or relative information that will inform the point estimate of the expected return on equity.

The AER proposes to determine the manner in which each piece of other information is used by assessing the information against the assessment criteria. This assessment is outlined in the explanatory statement to this guideline.

The outcome of the AER's assessment on the form of additional information is outlined in table 5.3.

Table 5.3 Form of 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

Source: AER analysis.

5.3.5 Step five: evaluate information set

The AER's fifth step proposes to evaluate the full set of material that will inform, in some way, the estimation of the expected return on equity. This includes assessing the foundation model range and point estimate alongside the other information from step four.

In undertaking this evaluation the AER may have regard to matters including:

- patterns shown in the 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).

5.3.6 Step six: distil point estimate of the expected return on equity

The AER's sixth step proposes to determine the final point estimate for the expected return on equity. The AER's proposes to use the foundation model point estimate as the starting point for estimating the expected return on equity.

The final point estimate of the expected return on equity will require the exercise of regulatory judgement. The AER proposes to draw on the analysis and evaluation of the other information undertaken in step five in exercising this judgement. For example, if the evaluation of other information suggests that the point estimate from the foundation model contributes to an estimate of the rate of return that achieves the allowed rate of return objective, then this point estimate (rounded) will be applied. Alternatively, if the evaluation suggests that the point estimate is too high or low, the point estimate will be changed by an amount informed by the other information (using the AER's regulatory judgment).

The AER proposes the final point estimate of the expected return on equity to be the foundation model point estimate, or alternatively, a different value that is a multiple of 25 basis points. If the foundation model point estimate is applied, the AER proposes to round this estimate to a single decimal point. This recognises the limited precision with which the expected return on equity can be estimated.

The approach outlined is premised on the expectation that the analysis in step five should not suggest a final estimate of the expected return on equity outside the foundation model range. If this expectation is not met, the AER may reconsider the foundation model input parameter estimates, or more fundamentally, the foundation model itself. This recognises that, ultimately, the AER's rate of return must meet the allowed rate of return objective.

6 Return on debt

This chapter sets out the AER's proposed approach to estimating the allowed return on debt for service providers.

6.1 Objective

The allowed return on debt must be estimated such that it contributes to the achievement of the allowed rate of return objective. It should therefore provide compensation to a service provider for the debt financing cost which is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk.

6.2 Rule requirements

The rules set out the:¹³

- calculation of the return on capital
- allowed rate of return objective (including factors the AER must have regard to in setting the rate of return)

In addition, the return on debt may be estimated by the AER using a methodology which results in either:

- the return on debt for each regulatory year in the regulatory control period being the same; or
- the return on debt (and consequently the allowed rate of return) being or potentially being, different for different regulatory years in the regulatory control period.

In estimating the return on debt the AER must have regard to the following factors:

- the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity
- the interrelationship between the return on equity and the return on debt
- the incentive that the return on debt may provide in relation to capital expenditure over the regulatory control period, including as to the timing of capital expenditure
- any impacts (including in relation to the costs of servicing debt across regulatory control periods) on a benchmark efficient entity referred to in the allowed rate of return objective that could arise as a result of changing the methodology that is used to estimate the return on debt from one regulatory control period to the next.

6.3 Application

This section sets out the method the AER proposes to use to calculate the allowed return on debt.

¹³ NER, cls. 6.5.2 and 6A.6.2; NGR, r. 87.

6.3.1 Trailing average portfolio approach

The AER proposes to estimate the allowed return on debt using a trailing average portfolio approach following the completion of a transitional arrangement period. In particular, the AER proposes to apply the following:

- a trailing average portfolio approach with the length of the trailing average to be 10 years
- equal weights to be applied to all the elements of the trailing average
- the trailing average to be automatically updated every regulatory year within the regulatory control period.

In particular, the AER proposes to determine the allowed return on debt for each regulatory year within a regulatory control period in accordance with the following formula:

$${}_xkd_{x+1} = \frac{1}{10} \cdot \sum_{t=1}^{10} {}_{x-10+t}R_{x+t}$$

where:

- ${}_xkd_{x+1}$ refers to the allowed return on debt for regulatory year $x+1$
- ${}_{x-10+t}R_{x+t}$ refers to the estimated rate of return on debt that was entered into in year $(x-10+t)$ and matures in year $(x+t)$ (in the formula above all debt has a ten year term); and
- weights of $1/10$ apply to each element of the trailing average.

Estimates of ${}_{x-10+t}R_{x+t}$ represent simple averages of the estimates for each business day within the averaging period in year $(x-10+t)$. The AER proposes to obtain each daily estimate within the averaging period from an independent third party data provider in accordance with the estimation procedure specified in this guideline (section 6.3.3).

6.3.2 Transitional arrangements

The AER proposes to implement a trailing average portfolio approach after a period of transition for all regulated businesses. The AER proposes to apply a transitional arrangement to determine the allowed nominal return on debt (k_d) at the commencement of a service provider's forthcoming regulatory control period. The AER proposes the period of transition of 10 regulatory years. The proposed transition method is set out below.

In the transitional formulae:

- ${}_aR_{a+10}$ corresponds to the estimated return on debt that was entered into in year a and matures in year $a+10$; and
- ${}_bkd_{b+1}$ refers to the allowed return on debt for regulatory year $b+1$. The AER proposes to compute the estimates of ${}_aR_{a+10}$ in accordance with the specified estimation method and represent simple averages of the estimates for each business day within the corresponding averaging period.

In the first regulatory year of the transitional period, the AER proposes the allowed rate of return on debt to be based on the estimated prevailing rate of return on debt for that year (similar to the 'on the day' approach):

$${}_0kd_1 = {}_0R_{10}$$

In the second regulatory year, the AER proposes the allowed rate of return on debt to be the weighted average of the prevailing rates in the first and second regulatory year of the transitional period:

$${}_1kd_2 = 0.9 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11}$$

The AER proposes the allowed rate of return on debt in the third regulatory year to be the weighted average of the prevailing rates in the first, second, and third regulatory year of the transitional period:

$${}_2kd_3 = 0.8 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12}$$

The calculation for all subsequent regulatory years until the transitional period is completed is set out below:

$${}_3kd_4 = 0.7 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13}$$

$${}_4kd_5 = 0.6 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14}$$

$${}_5kd_6 = 0.5 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15}$$

$${}_6kd_7 = 0.4 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16}$$

$${}_7kd_8 = 0.3 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16} + 0.1 \cdot {}_7R_{17}$$

$${}_8kd_9 = 0.2 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16} + 0.1 \cdot {}_7R_{17} + 0.1 \cdot {}_8R_{18}$$

$${}_9kd_{10} = 0.1 \cdot {}_0R_{10} + 0.1 \cdot {}_1R_{11} + 0.1 \cdot {}_2R_{12} + 0.1 \cdot {}_3R_{13} + 0.1 \cdot {}_4R_{14} + 0.1 \cdot {}_5R_{15} + 0.1 \cdot {}_6R_{16} + 0.1 \cdot {}_7R_{17} + 0.1 \cdot {}_8R_{18} + 0.1 \cdot {}_9R_{19}$$

6.3.3 Estimation procedure

The AER proposes to apply the following estimation procedure for estimating the prevailing return on debt for each service provider during the averaging period:

- Using the published yields from an independent third party data service provider.
- Using a credit rating of BBB+ from Standard and Poor's or the equivalent rating from other recognised rating agencies. If the published yields do not reflect the assumed credit rating of BBB+ or the equivalent from rating agencies, the AER will apply the published yields that are the closest approximation of the BBB+ credit rating.
- Using a term to maturity of debt of 10 years. Where the yield at a term to maturity of 10 years is not published by the third party service provider, the AER proposes to determine the method for extrapolation at each network service provider's determination. The AER may estimate an extrapolation of the total debt yield or separately estimate the risk free rate and debt risk premium components (if extrapolation is required). Irrespective of which method is used the AER proposes that the risk free rate component of debt yield at a minimum should be applied at the annual update. The AER proposes to calculate the risk free rate component by adding the difference between the average annualised yields for Commonwealth Government Securities with a 10 year and the shorter term maturity. The averaging period that is proposed to apply is described in the next section.
- If the published yields from an independent third party data service provider are quoted on a semi-annual basis, then the AER proposes to annualise the yields by applying the following formula:

$$y_a = \left(1 + \frac{y_s}{2}\right)^2 - 1$$

where:

- y_a is the annualised yield
- y_s is the semi-annual yield published by an independent third party data service provider.

The AER proposes to specify in a service provider's determination how an automatic update of the trailing average would be applied in circumstances where estimation procedure for calculating the allowed return on debt is no longer available or has been amended during a service provider's regulatory control period.

Averaging period

For each regulatory year in the regulatory control period, the AER proposes to estimate the prevailing rate of return on debt as a simple average of the prevailing rates observed over a period of 10 or more consecutive business days up to a maximum of 12 months. Such an averaging period should satisfy the following conditions:

- it should be specified prior to the commencement of the regulatory control period
- at the time it is nominated, all dates in the averaging period must take place in the future
- it should be as close as practical to the commencement of each regulatory year in a regulatory control period

- an averaging period needs to be specified for each regulatory year within a regulatory control period
- the proposed averaging periods for different regulatory years are not required to be identical but should not overlap
- the nominal return on debt is to be updated annually using the agreed averaging period for the relevant regulatory year
- each agreed averaging period is to be confidential.

The averaging periods can be determined as follows:

- proposed by the service provider in the Framework and Approach process or in its initial regulatory proposal, and agreed by the AER; or
- if the AER does not agree to the averaging periods proposed by a service provider, the averaging period would be determined by the AER, and notified to the service provider within a reasonable time prior to the commencement of the regulatory control period.

7 Imputation credits

This section sets out the AER's approach to estimating the value of imputation credits. This primarily serves as an adjustment made to the cost of company income tax building block allowance.

7.1 Objective

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 actually retained by 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.

7.2 Rule requirements

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 Network Service Provider for each regulatory year (ETC_i) must be calculated in accordance with the following formula:

$$ETC_i = (ETI_i \times r_i) (1 - \gamma)$$

Where:

ETI_i 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 services if such an entity, rather than the Distribution Network Service Provider, operated the business of the Distribution Network Service Provider, such estimate being determined in accordance with the post-tax revenue model.

r_i is the expected statutory income tax rate for that regulatory year as determined by the AER; and

γ is the value of imputation credits

7.3 Application

This section sets out the method to be applied by a service provider to estimate the value of imputation credits.

Overall, the value of imputation credits would be estimated as a market wide parameter. Specifically, it would be determined as the product of:

- a payout ratio
- a utilisation rate.

The AER considers this approach leads to an estimate of 0.5 for the value of imputation credits, based on a payout ratio of 0.7 and a utilisation rate of 0.7.

7.3.1 Payout ratio

The payout ratio would be estimated using the cumulative payout ratio approach. This approach uses ATO tax statistics to calculate the proportion of imputation credits generated (via tax payments) that have been distributed by companies since the start of the imputation system. This approach leads to an estimate of 0.7 for the payout ratio.

7.3.2 Utilisation rate

The utilisation rate would be estimated using the body of relevant evidence with regards to its strengths and limitations, checked against a range of supporting evidence. The body of evidence includes:

- the equity ownership approach
- tax statistic estimates
- implied market value studies
- the conceptual goalposts approach.

In particular, the AER has higher regard to those approaches that:

- accord with the AER's interpretation of the nature of the utilisation rate parameter in the conceptual framework provided by Officer and Monkhouse (while acknowledging that interpretation of this framework is a matter of debate)
- are simpler and more transparent
- produce reasonable estimates in light of empirical realities and conceptual considerations; namely, that most (but not all) investors are eligible to redeem imputation credits, and that eligible investors in the possession of imputation credits have the incentive to redeem them.

This approach leads to an estimate of 0.7 for the utilisation rate, based on the AER giving:

- more regard to the equity ownership approach, which suggests an estimate of 0.7 to 0.8
- regard to tax statistic estimates, which suggest an estimate of 0.4 to 0.8
- less regard to implied market value studies, which suggest an estimate of 0 to 0.5
- less regard to the conceptual goalposts approach, which suggests an estimate of 0.8 to 1.0.

A Glossary

This guideline uses following definitions and acronyms.

Term	Definition
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
determination	In this document generally, in the context of the rate of return, the term "determination" refers both to regulatory determinations under the NER and access arrangement determinations under the NGR.
MRP	Market risk premium
NEL	National Electricity Law
NER	National Electricity Rules
new rules	The National Electricity Rules and National Gas Rules that were published by the AEMC on 29 November 2012
NGL	National Gas Law
NGR	National Gas Rules
QTC	Queensland Treasury Corporation
RAB	Regulatory Asset Base
regulatory control period	In this document generally, in the context of the rate of return, the term 'regulatory control period' refers both to regulatory control period under the NER and access arrangement period under the NGR
service providers	Electricity transmission network service provider, electricity distribution network service providers and gas service providers
the guideline	Rate of return guideline
WACC	Weighted average cost of capital
2009 WACC review	AER 2009 review of the weighted average cost of capital (WACC) parameters (published in May 2009).

B Estimation of the return on debt: an example

The purpose of this appendix is to illustrate how the AER proposes to estimate the return on debt under the trailing average portfolio approach and how the AER proposes to implement the transition.

For the example provided below the AER simulated monthly yield data using the model suggested in appendix A of the QTC's submission to the consultation paper.¹⁴ The AER emphasises that the model was chosen purely for illustrative purposes. The AER makes no comments on how accurately it describes the short-term movements in the return on debt in Australia under the current market conditions.

The simulation model specified by the QTC is as follows:

$$S_t = S_{t-1} + \alpha T(\theta - S_{t-1}) + \sigma\sqrt{T}\varepsilon_t$$

where:¹⁵

- S_t is the randomly generated interest rate at time t
- S_{t-1} is the randomly generated interest rate at time $t-1$
- T is the time increment in years ($T=1/12$ to produce monthly observations)
- α is the parameter characterising annual mean reversion speed ($\alpha=0.2$)
- θ is the long-term average interest rate ($\theta=7.0$ per cent)
- σ is the annualised yield volatility parameter ($\sigma=12.0$ per cent)
- ε_t are the independent identically distributed random variables, distributed normally with zero mean and standard deviation of one.

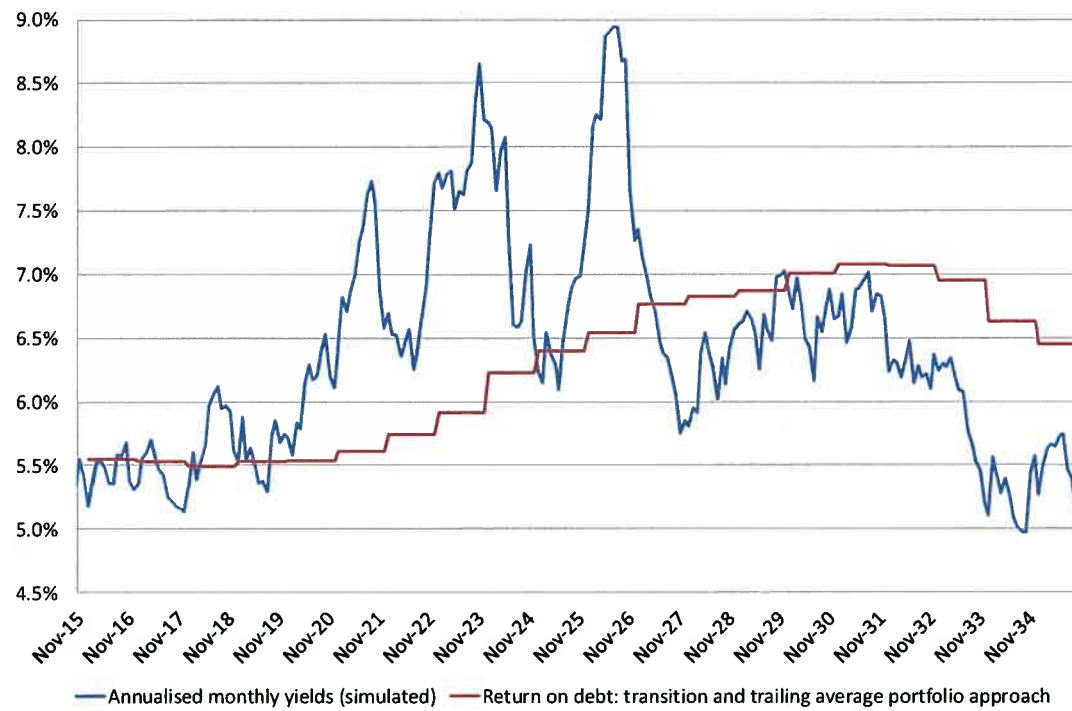
The AER chose the starting rate of return to be equal to the average of Bloomberg seven year BBB yields, extrapolated out to ten years using the paired bonds approach for the period from 28 October 2013 to 22 November 2013. The AER generated 300 monthly observations. For the purposes of this example, the AER assumed a service provider had a five year regulatory control period, and the next regulatory control period would start on 1 January 2016. The AER also assumed that the averaging periods for each regulatory year were set to the month of November of the previous year.

Figure B.1 illustrates the allowed return on debt during the transitional period of January 2016 to December 2025. Following the transitional period, the allowed return on debt is estimated according to the trailing average portfolio approach (red solid line). Note that the allowed return on debt in the first regulatory year of the transitional period is equal to the 'on the day' allowance for the same regulatory year.

¹⁴ Queensland Treasury Corporation (QTC), *Submission to AER's rate of return guidelines consultation paper*, 21 June 2013, pp. 29–30.

¹⁵ Due to the scarcity of relevant data for ten year debt and since the example is provided purely for illustrative purposes, we used the same parameter values as those provided by the QTC.

Figure B.1 An example of estimated allowed rate of return on debt during a transitional period and under the trailing average portfolio approach



Source: AER analysis.

Table B.1 provides details of the estimation of the allowed return on debt for the first 11 regulatory years.

Table B.1 Example of the estimated return on debt allowance calculations (per cent)

Regulatory year	Prevailing rate during the averaging period	Computations	Allowed return on debt
2016	5.55	5.55	5.55
2017	5.38	$0.9 \cdot 5.55 + 0.1 \cdot 5.38$	5.53
2018	5.16	$0.8 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16$	5.49
2019	5.92	$0.7 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92$	5.53
2020	5.68	$0.6 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68$	5.54
2021	6.21	$0.5 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21$	5.61
2022	6.88	$0.4 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21 + 0.1 \cdot 6.88$	5.74
2023	7.29	$0.3 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21 + 0.1 \cdot 6.88 + 0.1 \cdot 7.29$	5.92
2024	8.65	$0.2 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21 + 0.1 \cdot 6.88 + 0.1 \cdot 7.29 + 0.1 \cdot 8.65$	6.23
2025	7.24	$0.1 \cdot 5.55 + 0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21 + 0.1 \cdot 6.88 + 0.1 \cdot 7.29 + 0.1 \cdot 8.65 + 0.1 \cdot 7.24$	6.40
2026	6.99	$0.1 \cdot 5.38 + 0.1 \cdot 5.16 + 0.1 \cdot 5.92 + 0.1 \cdot 5.68 + 0.1 \cdot 6.21 + 0.1 \cdot 6.88 + 0.1 \cdot 7.29 + 0.1 \cdot 8.65 + 0.1 \cdot 7.24 + 0.1 \cdot 6.99$	6.54

Source: AER analysis.



Better Regulation

Explanatory Statement Rate of Return Guideline

December 2013

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Shortened forms

Shortened term	Full title
ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
capex	Capital expenditure
common framework	Refers to the largely consistent rules framework on the rate of return that applies to gas service providers (NGR), electricity distribution network service providers (NER chapter 6) and electricity transmission service providers (NER chapter 6A).
COSBOA	Council of Small Business Australia
CRG	Consumer Reference Group
determination	In this document generally, in the context of the rate of return, the term 'determination' refers both to regulatory determinations under the NER and access arrangement determinations under the NGR.
DRP	Debt Risk Premium
ENA	Energy Networks Association
ERA	Economic Regulation Authority
EUAA	Energy Users Association of Australia
EURCC	Energy Users Rule Change Committee
FIG	The Financial Investor Group
MRP	Market risk premium
MEU	Major Energy Users Inc
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rules
new rules	The National Electricity Rules and National Gas Rules that were published by the AEMC on 29 November 2012
NGL	National Gas Law
NGO	National Gas Objective
NSW T Corp	New South Wales Treasury Corporation
opex	Operating expenditure
PIAC	The Public Interest Advocacy Centre
The QTC	The Queensland Treasury Corporation

RAB	Regulatory Asset Base
RARE	RARE Infrastructure Limited
RDB	Regulatory Development Branch
regulatory control period	In this document generally, in the context of the rate of return, the term 'regulatory control period' refers both to regulatory control period under the NER and access arrangement period under the NGR.
service providers	Electricity transmission network service provider, electricity distribution network service providers and gas service providers
SFG	Strategic Finance Group Consulting
subsequent regulatory control period for service providers	Expected to be 1 July 2015 to 30 June 2019.
transitional regulatory control period for service providers	1 July 2014—30 June 2015
transitional rules	Transitional rules contained in the National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012 No. 9 (Network Regulation rule change) which the AEMC determined in November 2012. These transitional rules set out the transitional arrangements for the next ACT/NSW electricity distribution determinations.
the guideline	Rate of return guideline
WACC	Weighted average cost of capital
2009 WACC review	AER 2009 review of the weighted average cost of capital (WACC) parameters (published in May 2009).

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Executive summary

The AER is the independent regulator for the Australian national energy market. We are guided in our role by the national electricity and gas objectives. These objectives focus on promoting the long term interests of consumers.

In 2012, the Australian Energy Market Commission (AEMC) amended the electricity and gas rules to require us to develop a guideline which outlines our approach to setting the rate of return for regulated electricity and gas network businesses.

The requirements of the rules and the new regulatory framework

This final explanatory statement accompanies our rate of return guideline for electricity and gas transmission and distribution networks (the guideline). The rules require us to develop this guideline and to specify within it:¹

- The method we propose to use to estimate the allowed rate of return (derived from the expected return on equity and the return on debt) for electricity and gas network businesses.
- The method we propose to use to estimate the value of imputation tax credits used to establish a benchmark corporate income tax allowance.
- How these methods will result in an allowed return on equity, return on debt and value for imputation tax credits which is consistent with the allowed rate of return objective.

The rules require us to determine an allowed rate of return that achieves the allowed rate of return objective at the time we make a revenue or access arrangement determination:

The allowed rate of return objective is that the rate of return for a [regulated network] 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 [regulated services].²

The guideline is not binding on us in determining the allowed rate of return or on service providers in proposing their allowed rate of return as part of their revenue proposals. However, should we decide to depart from the guideline we must provide reasons for doing so. Equally, while it is open to network businesses to move away from the guideline within their specific revenue proposals, the rules require that they provide reasons for a proposal to depart from the approach set out in the guideline.

The rules also require us to set out in the guideline the estimation methods, financial models, market data and other evidence that we propose to take into account in estimating the expected return on equity, return on debt and the value of imputation tax credits.³ In doing so, the rules require us to exercise our regulatory judgement in estimating the allowed rate of return. We propose to apply a number of criteria to inform our regulatory judgement. The guideline and accompanying explanatory statement explains how we propose to exercise our judgement.

We consider that our approach is consistent with the features of a good rate of return framework as outlined by the AEMC.⁴ As such, we consider our proposed approach promotes the national electricity

¹ NER cl. 6.5.2 (n) (1); 6A.6.2(n); NGR, r. 87(13).

² NER, cl.6.5.2(c) and 6A6.2(c); NGR, r.87(3).

³ NER cl. 6.5.2 (n) (2); NGR, r. 87(14)(b).

⁴ AEMC, *Final Position Paper, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 15 November 2012, pp.26–29.

and gas objectives and will contribute to achieving the allowed rate of return objective. In particular, our proposed approach focuses on:

- At both the return on equity and return on debt, the efficient financing costs for a benchmark efficient entity. This framework provides incentives for business to pursue efficient financing practices to support efficient investment while at the same time protecting consumers from the costs of inefficient practices.
- Application of assessment criteria to guide our selection and use of estimation methods, models, market data and other evidence which will inform our assessment of the overall rate of return. The application of the criteria will support consistency and transparency in our regulatory decisions and contribute to achieving the allowed rate of return objective.
- Adoption of an approach that is responsive to changing market conditions and new evidence but at the same time provides sufficient certainty to network businesses, investors and consumers regarding our approach to estimating the overall rate of return.
- Promotion of effective consumer participation through an accessible consultation process.

The major features we propose in the guideline include:

- Considering a broad range of material in arriving at a point estimate of the allowed return on equity. We propose to use the Sharpe–Lintner capital asset pricing model (CAPM) to determine a starting point estimate and a range for the return on equity. We propose to also use the Black CAPM and estimates from dividend growth models, among other information, to inform the estimation of the Sharpe–Lintner CAPM input parameters. We also propose to have regard to the return on equity suggested by the Wright approach, valuation and broker reports, and decisions by other regulators. Where appropriate, this information may lead us to set an estimate of the return on equity that differs from the output of the Sharpe–Lintner CAPM.
- Applying a trailing average portfolio approach for estimating the return on debt. The trailing average will be calculated using a simple ten year average and will be updated annually. We propose a transition period from the current 'on the day' approach to the trailing average portfolio approach for all regulated businesses.
- Considering a wide range of material to inform the estimation of the value of imputation credits.

Further details on key aspects of our guideline are outlined below.

Benchmark efficient entity

We propose to define the benchmark efficient entity as a 'pure play', regulated energy network business operating within Australia.

We maintain our view that the risks faced by gas and electricity businesses are sufficiently similar to warrant only one benchmark across all businesses. We do not consider that a separate benchmark for electricity or gas businesses is warranted based on the evidence before us. We note that the empirical evidence before us does not show any material difference between the results for gas and electricity businesses. We also consider that the regulatory framework mitigates the risk exposure of the regulated businesses. Furthermore, the similar framework applying between gas and electricity reduces potential divergences between the two sectors.

Our proposed approach to the definition of the benchmark efficient entity is discussed in chapter 3 of this explanatory statement and chapter 3 of the guideline.

Overall rate of return

The overall rate of return will be estimated by applying a nominal vanilla weighted average cost of capital (WACC) formula.⁵ The use of a nominal vanilla WACC is a requirement of the electricity and gas rules, and was therefore not within the scope of the AER's review as set out in this guideline. The rate of return is a weighted average of the expected return on equity and the return on debt.

The weights used reflect our assessment of the relative proportion of equity and debt in the total financing arrangements of a benchmark efficient network business. We propose to calculate the overall rate of return assuming a benchmark gearing ratio of 60 per cent. Our proposed approach to gearing is discussed in appendix F of this final explanatory statement. The tax effects are captured in the corporate income tax building block of the post-tax revenue model, and include an adjustment for the value of imputation tax credits.

We propose that the allowed overall rate of return will be updated annually. This is because we propose the return on debt to be updated annually. On the other hand, we propose the allowed return on equity to be set for the duration of the regulatory period.

The overall rate of return will be a point estimate, reflecting the use of point estimates for the allowed return on equity, return on debt and gearing level. We propose that the return on equity point estimate will be chosen from within a range for the return on equity.

Our proposed approach to the overall rate of return is discussed in chapter 4 of this final explanatory statement and chapter 4 of the guideline.

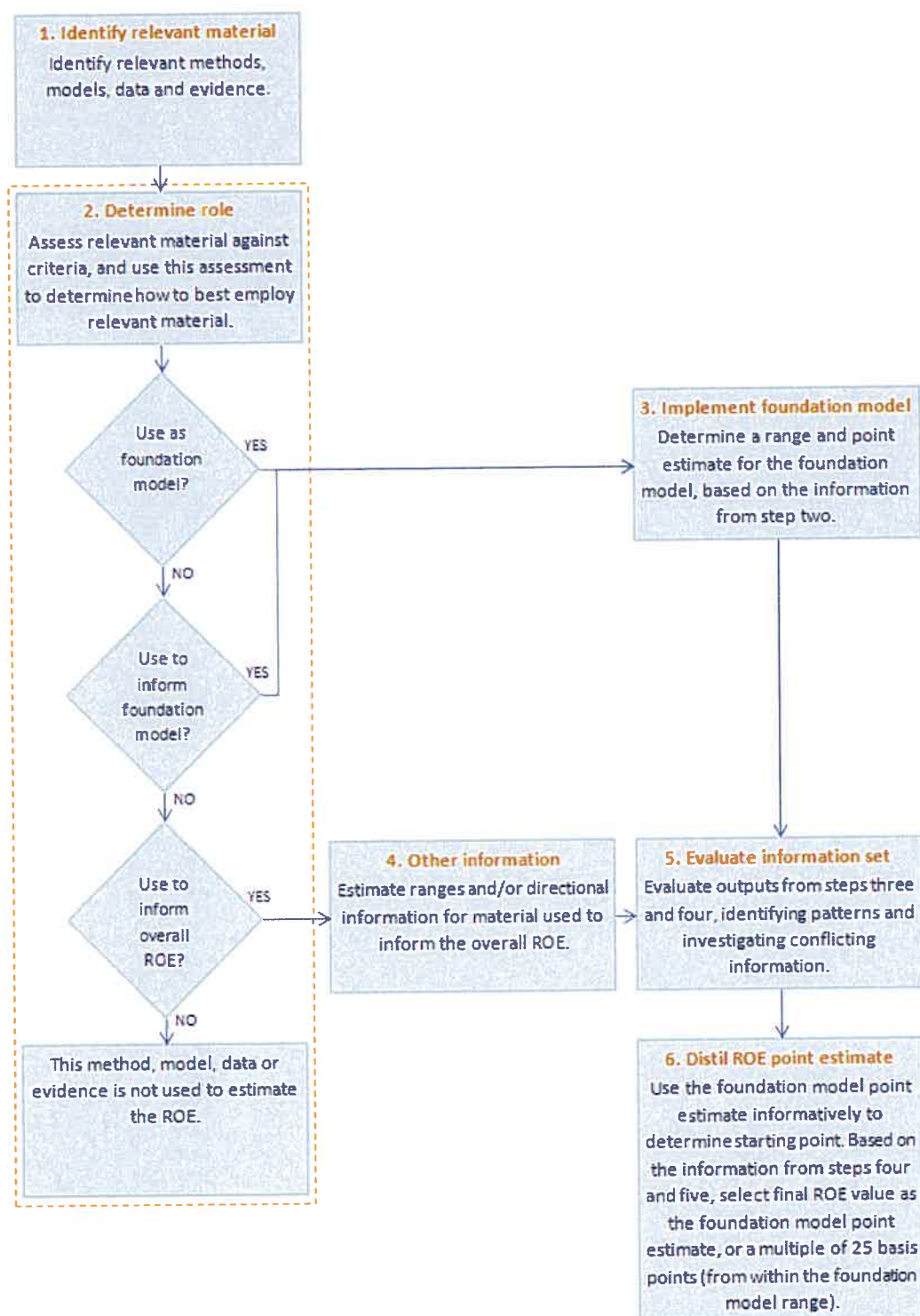
Return on equity

To determine an estimate of the expected return on equity that is consistent with the allowed rate of return objective, we propose an approach that has regard to a broad range of relevant material. This approach uses the Sharpe–Lintner CAPM as the foundation model, but draws on additional models and information to determine the final return on equity point estimate. The use of the Sharpe–Lintner CAPM promotes simplicity, transparency and certainty of process.

Our proposed approach is outlined in chapter 5 and is summarised in the following flow chart. It contains six steps, and results in a single point estimate for the expected return on equity. In appendices A and B, we have completed steps one and two. That is, identify relevant methods, models, data and other information and assessing it against our criteria for determining how the information will be used. In order to promote greater certainty, we have also set out our application of step three in implementing the foundation model as at December 2013. This is set out in chapter 6 and appendices C and D. However, the application of step three will be updated based on the latest data at the time of each reset determination. Accordingly, the parameter estimates we set out in this explanatory statement for step three may differ from the parameter estimates we adopt in future reset determinations. In chapter 5, we set out an explanation of our approach to steps four to six, however the application of these steps will occur at the time of each reset determination.

⁵ A nominal vanilla WACC is the combination of a nominal post-tax return on equity and a nominal pre-tax return on debt.

Figure 1 Proposed approach to estimating the return on equity



Source: AER analysis.

The risk free rate, which is an input into the foundation model, can be observed with reasonable certainty, and so we propose to adopt a point estimate for the risk free rate at the time of each determination. We propose that the point estimate for the risk free rate (used in the return on equity calculation) will be based on the prevailing yield on 10 year Commonwealth Government Securities (CGS) over a short (20 business day) period as close as practicably possible to the commencement

of the regulatory period. The dates of the averaging period will be determined by the AER and disclosed in the draft decision of each determination.

The equity beta and market risk premium (MRP) cannot be as readily observed. In recognition of this uncertainty we propose to estimate ranges for these parameters from within which we propose to select a point estimate for each parameter. The adoption of point estimates and ranges for some parameters will consequently result in a range and a point estimate for the return on equity based on a Sharpe–Lintner CAPM.

In estimating the MRP, we place most emphasis on historical estimates (which gives an MRP estimate of approximately 6 per cent) and dividend growth model estimates (which give changing MRP estimates over time, particularly in response to changing interest rates). Our approach to the MRP is symmetrical. This means we may adopt a value above 6 per cent when dividend growth model estimates are above the historical estimates (as they are at December 2013), and a value lower than 6 per cent when dividend growth model estimates are below the historical estimates. At December 2013, our MRP point estimate is 6.5 per cent, chosen from within a range of 5 to 7.5 per cent.

We propose to adopt an equity beta of 0.7, chosen from within a range of 0.4 to 0.7. This is consistent with our view that returns to network businesses vary less with economic conditions than returns for the equity market as a whole. In setting the range, we have regard to empirical estimates of listed Australian energy networks. In selecting a point estimate at the upper end of this range, we have regard to other factors including empirical estimates of international energy businesses.

Our starting point for estimating the final return on equity will be the foundation model point estimate. Moreover, the final point estimate is expected to be selected from within the foundation model range.

The final estimate of the expected return on equity, however, will ultimately require the exercise of regulatory judgement. This judgement will draw on the analysis of the other information provided in step five. For example, we may determine an estimate of the return on equity that is higher (lower) than the foundation model estimate where the other information indicates a higher (lower) return is appropriate. The relative strengths and limitations of each source of other information, as well as the consistency of patterns in this information, will be important.

The use of regulatory judgement may also suggest a final estimate of the return on equity that is outside the foundation model range. In these circumstances, we may reconsider the foundation model input parameter estimates, or more fundamentally, we may also reconsider the foundation model itself. That said, we expect our final return on equity estimate, in most market circumstances, to fall within the foundation model range.

Further, under our approach, if the foundation model point estimate is not adopted the final estimate of the return on equity will be determined as a multiple of 25 basis points. This recognises the limited precision with which the return on equity can be estimated. It is also consistent with our approach of only using the foundation model informatively.

We consider our return on equity approach provides an appropriate balance between transparency, simplicity, certainty and replicability. We also expect this approach to lead to more stable estimates of the return on equity than under our previous approach.

Our proposed approach to estimating the expected return on equity is discussed in chapters 5 and 6 of this final explanatory statement and chapter 5 of the guideline.

Return on debt

We propose to apply a trailing average portfolio approach to estimate the return on debt. This approach means that the allowed return on debt more closely aligns with the efficient debt financing practices of regulated businesses and means that prices are likely to be less volatile over time. The trailing average would be calculated over a ten year period. The annual updating of the trailing average should also reduce the potential for a mismatch between the allowed return on debt and the return on debt for a benchmark efficient entity. This should reduce cash flow volatility over the longer term.

In addition, the guideline specifies a gradual transition from the current approach of using prevailing rates as close as possible to the start of the regulatory control period (the 'on the day' approach) to the trailing average portfolio approach. The transition will occur over a period of 10 years. We propose to apply this transition to all service providers consistent with our view that there is a single benchmark efficient entity.

Further, the guidelines set out the proposed method to calculate the allowed return on debt. In particular, we propose to use an independent third party data service provider to estimate the allowed return on debt. We also propose that the return on debt will be calculated over 10 or more consecutive business days, using yield estimates for a 10 year debt term and the closest proximate for a BBB+ credit rating or its equivalent.

The guideline also specifies that the trailing average must be updated during a regulatory control period using the method set out in the guideline. We propose to specify in a service provider's determination how an automatic update to the trailing average can be applied in circumstances where the method of calculating the allowed return on debt is no longer available or has been amended during a service providers regulatory control period.

Our proposed approach to, and implementation of, the return on debt are discussed in chapters 7 and 8 of this explanatory statement and chapter 6 of the guideline.

Imputation credits

Under a post-tax framework, which is required by the electricity and gas rules, the value of imputation credits is included within the calculation of the corporate tax liability.⁶ This is reflected in the revenue cash flows via the corporate tax component of the building block model.

We propose that the value of imputation credits is based on the product of the payout ratio and the utilisation rate. We also propose an approach that has regard to a broad range of information to inform these inputs—including the equity ownership approach, taxation statistics, implied market value studies and the conceptual goalposts approach. Having had regard to this material, and the strengths and weaknesses of each source of evidence, we consider that 0.5 is a reasonable estimate of the value of imputation tax credits.

Our proposed approach to the valuation of imputation tax credits is discussed in chapter 9 of this final explanatory statement and chapter 7 of the guideline.

⁶ The value of imputation credits is an estimate of the expected proportion of company tax which is returned to investors through the utilisation of imputation credits.

Development and application of the guideline

Important to our success in developing the guideline was to hear from all stakeholders on the matters that are important to them. In developing the guideline we have undertaken an extensive consultation process to provide stakeholders with multiple opportunities to raise and discuss matters. This comprehensive consultation process (outlined in chapter 1) was intended to ensure that the guideline addresses all relevant issues and reduces the need for any unnecessary departures from the guideline. This should also minimise the scope for extensive review of the proposed approach at each revenue or access arrangement determination. This should provide stakeholders with greater certainty and predictability as to how we will assess rate of return requirements at each determination.

We believe the new rate of return assessment framework, applied consistently over time, will address the desirability for regulatory stability through greater transparency of the key components of the rate of return and how these are assessed. This will enhance predictability, thereby lowering uncertainty for stakeholders. Our approach also provides the scope to be responsive to changing market conditions and new evidence in setting the allowed rate of return. Further, our approach will balance the interests of stakeholders by providing the opportunity for the recovery of efficient financing costs and more stable returns for the businesses, and more stable price movements for consumers. We consider this will support the necessary attraction of long term capital investment, whilst addressing the long term interests of consumers.

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.

Our Better Regulation program involves the publication of several guidelines, including publication of the rate of return guideline (the guideline). The guideline will set out the approach we intend to take to determining the allowed rate of return in accordance with the National Electricity Law (NEL) and the National Gas Law (NGL) (collectively, the law).

This explanatory statement is the final paper in our consultation process for developing the draft guideline for the regulated electricity and gas transmission and distribution network service providers (the 'service providers'). It follows the Australian Energy Market Commission's (AEMC) changes to the rules on 29 November 2012. The aim of these reforms is to deliver an improved regulatory framework that focuses on the long term interests of energy consumers.

This chapter provides an introduction and background to the guidelines. First, the rate of return framework is discussed. This is followed by a summary of the role of the guideline and the applicability of this guideline to forthcoming regulatory determinations. Lastly, issues arising from the implementation of the guideline are discussed.

1.1 Rate of return regulatory framework

The return on capital often represents the largest component of the revenue determinations of service providers. A service provider should be provided with a reasonable opportunity to recover at least the efficient costs it incurs in providing regulated services and complying with a regulatory obligation or requirement or making a regulatory payment. The allowed rate of return allows service providers to obtain necessary funds from capital markets to fund capital investments and service the debt they incur in borrowing the funds. The rate of return can make up approximately 50 per cent of the revenue needs for a service provider. Therefore, the rate of return is a key element of the network charges that consumers pay.

The previous frameworks for estimating the rate of return for electricity transmission, electricity distribution and gas service providers differed in a number of respects, in particular the extent of prescription in the rules and whether the estimate was made at each determination or in a periodic review.⁷

The changes to the rules made by the AEMC were initiated by the AER in September 2011.⁸ In the rule change request, we stated:⁹

⁷ The former frameworks refer to frameworks prior to issuance of AEMC's final determination published on 29 November 2012 which sets out the amendments that have been made to the rules. The former frameworks are provided in chapter 6A of the NER for electricity transmission, chapter 6 of the NER for electricity distribution, and rule 87 of the NGR for gas service providers.

⁸ For more on the rule change process, see: <http://aemc.gov.au/Electricity/Rule-changes/Completed/economic-regulation-of-network-service-providers-.html>.

⁹ AER, *Cover letter to AEMC - Rule change proposal - energy network regulation reform*, 29 September 2011, see: <http://www.aemc.gov.au/electricity/rule-changes/erc0134--initiation-documents.html>.

The current restrictions on an objective assessment of the efficiency or the necessity of expenditure proposed by electricity businesses is causing consumers to pay more than they should for a safe and reliable supply of electricity services. Our proposed changes allow for a more effective and robust assessment of the costs proposed by electricity network businesses.

...The AER is also proposing a consistent approach for setting the rate of return on investment for gas and electricity network businesses. These changes would provide certainty for investors while ensuring that the regulator's approach can keep pace with changing financing practices.

The AEMC was concerned that the AER should be better able to respond to changing financial market conditions and the availability of new evidence. In its final determination, the AEMC concluded that none of the previous rate of return frameworks was capable of best fulfilling the requirements of the National Electricity Objective (NEO) and the National Gas Objective (NGO) (collectively, the objectives), and the Revenue and Pricing Principles (RPP). The AEMC considered that a new rate of return framework was therefore needed.¹⁰

After an extensive consultation process, the AEMC amended the rules to include new requirements relating to the framework for estimating the rate of return on capital. The new rules require us to determine an allowed rate of return that achieves the allowed rate of return objective at the time we make a revenue or access arrangement determination. The allowed rate of return for a regulatory year must be a weighted average of the return on equity for the regulatory control period in which that regulatory year occurs and the return on debt for that regulatory year.¹¹ The allowed rate of return objective is:¹²

...that the rate of return for a [regulated network] 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 [regulated services].

The new rules give us the discretion to adopt the approach we consider most appropriate to estimate the rate of return with the ability to take into account a wider range of relevant estimation methods, financial models, market data and other evidence as well as considering inter-relationships between parameter values. This will enable us to determine the best estimate of the required rate of return at the time of each regulatory determination.

Further, this aspect of the new rate of return framework incorporates a greater degree of regulatory judgement than did the previous framework. As part of the new framework, the AEMC has not included any preferred methods for estimating components of the rate of return. Instead, the AEMC has provided high-level principles to guide the estimation of the rate of return consistent with achieving the overall allowed rate of return objective.

To assist us in this assessment process and to provide greater transparency around this, we are proposing to use a set of criteria which we will apply in making judgements and decisions about the estimation methods, financial models, market data and other evidence. This discussed in chapter two.

Further, we consider that the objectives, and the overall rate of return objective, will be best achieved through the exercise of regulatory practices that:

- recognise the desirability of consistent approaches to regulation across the energy industry, so as to promote economic efficiency
- promote incentives to finance efficiently

¹⁰ AEMC, *Final determination*, 29 November 2012, p. 42.

¹¹ NER, cl. 6.5.2(d), cl. 6A.5.2(d). should there be a reference to the NGR as well?

¹² NER, cl. 6.5.2(c) and cl. 6A.6.2(c); NGR, r. 87(3).

- promote reasoned, predictable and transparent decision making
- promote flexibility and adaptability, to allow our decisions to respond to changing circumstances, and to take account of a wider range of assessment methods and information in estimating the rate of return; and
- improve the regulatory determination process to allow us adequate time for decision making, to enhance consumer engagement, and to increase transparency and accountability.

In our view, the framework allows us to focus on the overall objective of making decisions that are in the long-term interests of consumers. In essence this requires the regulatory process to look not only at the short term impact of proposals but also how these will affect price and service outcomes for customers over a longer period. It is important to keep this longer term perspective in mind when considering improvements to our regulatory approaches. In keeping with the overall objectives of incentive regulation, the overall rate of return should provide service providers effective incentives to promote economic efficiency with respect to services they provide.

The desirability of achieving the specific aims of incentive regulation may be linked back to the efficiency requirements of rules. For example, the revenue and pricing principles refer explicitly to the need to provide effective incentives to promote economic efficiency.¹³

A service provider should be provided with effective incentives in order to promote economic efficiency with respect to the regulated services that it provides, this includes promoting the:

- efficient investment in a distribution or transmission system
- efficient provision of energy network services
- efficient use of the distribution system or transmission system.¹⁴

Accordingly, the RPPs are an important framework issue for assessing how the national electricity and gas objectives and the rate of return objective interrelate. In assessing the rate of return we must be consistent with the objectives. This is more likely to be achieved where our decisions are consistent with the principles of incentive based regulation.

For example, it is important that the regulatory framework delivers incentives for the service providers to undertake efficient investment. This will be achieved where the required rate of return is set at the level which is commensurate with the risks facing the benchmark efficient entity. In circumstances where the allowed rate of return is higher (lower) than the required rate of return, this may lead to inefficient over investment or under investment.

1.2 The role of the guideline

The new rules require us to develop a rate of return guideline that sets out the approach we intend to take to determining the allowed rate of return for both electricity and gas service providers. To give effect to the new rules on the rate of return, we are required to develop and a publish rate of return guideline covering:

¹³ NEL, s. 7A. Similar provisions are included for the NGL, see section 24.

¹⁴ NEL, s. 7A. Similar provisions are included for the NGL, see section 24.

- (1) The methodologies that the AER proposes to use in estimating the allowed rate of return, including how those methodologies are proposed to result in the determination of a return on equity and a return on debt in a way that is consistent the allowed rate of return objective.
- (2) The estimation methods, financial models, market data and other evidence we propose to take into account in estimating the return on equity, the return on debt and the value of imputation credits.¹⁵

Accordingly, the guideline sets out:

- our proposed positions on the elements for assessing the rate of return including the return on equity and return on debt
- the estimation methods, financial models, market data and other evidence that we propose to take into account when estimating the allowed rate of return
- the way in which we propose to take into account the estimation methods, financial models, market data or other evidence.

The aim of the guideline is to provide sufficient detail to allow a service provider or other stakeholders to understand our approach and how we will exercise our discretion consistent with the rate of return objective.

In its final determination, the AEMC specifically stated that the guideline would be non-binding on us or on service providers. Although the guideline is non-binding in nature, in practice we and the service providers will be expected to follow the guideline when setting the rate of return. In the event that a service provider seeks to depart from the guideline in proposing an alternative approach to setting the rate of return, they would need to provide compelling reasons and evidence for a proposed departure. The same obligation rests on us if we wished to depart from the approach set out in the guideline.

The rules require us to review the rate of return guideline at least every three years. In our view subsequent guidelines are likely to be limited to incremental changes in approach.

1.3 Applicability of this review to forthcoming regulatory determinations

Once completed, we intend to apply the guideline to the next round of regulatory determinations to be submitted to us in 2014 (see table 1.1 and table 1.2).

The rules include transitional arrangements to enable us to apply the new rules as soon as possible. This will allow the benefits of the new rules to flow through to consumers more quickly.

¹⁵ NER, cl. 6.5.2 and 6A.6.2(c); NGR, r. 87.

Table 1.1 Timetable for regulatory determinations (electricity)

Service provider		Framework and approach paper published	Regulatory proposal due	Regulatory period commence
2014–15 Group of NSPs	TransGrid and Transend (NSW and Tas transmission)	31 January 2014	Transitional: 31 January 2014 Full: 31 May 2014	Transitional: 1 July 2014 Full: 1 July 2015
	ActewAGL, Ausgrid, Endeavour Energy and Essential Energy (ACT and NSW distribution)	Part 1: 31 March 2013 Part 2: 31 January 2014	Transitional: 31 January 2014 Full: 31 May 2014	Transitional: 1 July 2014 Full: 1 July 2015
Directlink (Interconnector between Qld and NSW)		31 January 2014	31 May 2014	1 July 2015
2015–16 Group of DNSPs	Ergon Energy, Energex and SA Power Networks (Qld and SA distribution)	30 April 2014	31 October 2014	1 July 2015
	Jemena, United Energy, Citipower, Powercor and SP AusNet (Vic distribution)	31 October 2014	30 April 2015	1 January 2016
Post 2016 Group	Aurora Energy (Tas distribution)	31 July 2015	31 January 2016	1 July 2017
	Powerlink (Qld transmission)	31 July 2015	31 January 2016	1 July 2017
	ElectraNet (SA transmission)	31 July 2016	31 January 2017	1 July 2018
	Murraylink (Interconnector between SA and Vic)	31 July 2016	31 January 2017	1 July 2018

Source: AEMC, *Final rule determination*, 29 November 2012, p. 229.

Table 1.2 Timetable for regulatory determinations (gas)

Service provider		Regulatory proposal due	Access arrangement period commence
Gas Distribution			
2014–15 Group of NSPs	Envestra (Wagga Wagga), Jemena (NSW Gas Distribution)	June 2014	1 July 2015
	ActewAGL (ACT Gas Distribution)	June 2015	1 July 2016
	APT Allgas, Envestra (Qld), Envestra (SA) (Qld and SA Gas Distribution)	June 2015	1 July 2016
	Envestra (Albury), SP AusNet, Multinet, Envestra (Vic) (Vic Gas Distribution)	December 2016	1 January 2018
Gas Transmission			
2014–15 NSP	Dawson valley pipeline (Qld Gas Transmission)	September 2014	September 2015
	Amadeus gas pipeline (NT Gas Transmission)	July 2015	1 July 2016
	Roma to Brisbane pipeline (Qld Gas Transmission)	August 2016	1 July 2017
	APA GasNet (Vic Gas Transmission)	December 2016	1 January 2018

Source: AER analysis.

4 Consultation process

Important to our success in developing the guideline was to hear from all stakeholders on the matters that are important to them. In developing the guideline we have undertaken extensive consultation process to provide stakeholders with multiple opportunities to raise and discuss matters.

This comprehensive consultation process is intended to ensure that the guideline addresses all relevant issues and reduces the need for any unnecessary departures from the guideline. This should also minimise the scope for extensive review of the proposed approach at each revenue or access arrangement determination. This should provide stakeholders with greater certainty and predictability as to how we will assess rate of return requirements at each determination. An outline of the consultation process that was undertaken in the development of the guideline is provided below:

- On 18 December 2012, we released an issues paper. This paper raised and sought comment on a broad range of issues at a high level with no firm positions taken by us. We received 20 submissions on the issues paper.

- On 5 February 2013, we hosted a forum on the development of the guideline. A range of stakeholders including representatives of regulated energy businesses, energy users, state regulatory authorities, government statutory authorities and investors in regulated utilities participated in this forum. At the forum we sought high level views from participants on key matters. Forum participants discussed issues set out in our issues paper. Stakeholders sought clarification on how we would apply the principles set out in the issues paper and explain how these principles related to the objectives and the RPP.
- On 25 and 26 February 2013 we held two sub-group workshops on: i) the overall rate of return and cost of equity ii) the cost of debt. Again a range of stakeholders attended these workshops and discussed the key issues relating to development of guideline including the role of the principles, the nature of the benchmark efficient entity, the use of financial models and approaches for estimating the cost of equity and cost of debt.
- In May 2013 we released a consultation paper. This paper sought comments on our preliminary positions on some elements of the rate of return. We received 41 submissions on the consultation paper.
- On 3 and 4 June 2013 we held two sub-group workshops on: i) approach to return on debt benchmark and ii) return on equity—models assessment. A large number of stakeholders attended these workshops. The debt workshop discussed the key issues relating to approach to return on debt- benchmark ('on-the day' and portfolio), trailing average, annual updating of a trailing average, weighting, and transitional arrangements. The equity workshop discussed various models used for assessing the return on equity.
- On 18 June 2013 we held another workshop on relationship between risk and the rate of return, and implications for the definition of the benchmark efficient entity. Again a large number of stakeholders and the consultants attended this workshop. Frontier Economics made presentations on: i) characteristics and exposures of energy networks in general and ii) differences in risk exposures of different types of energy networks. Associate Professor Graham Partington made a presentation on accounting for risk within the regulatory framework. The consultants also responded to the stakeholders questions.
- On 30 August 2013, following the release of the draft rate of return guideline we held an information session presented by the AER Chairman, Andrew Reeves outlining the details of our draft guideline. We published a copy of the presentation and answers to all questions raised during the session. In response to the draft guideline and accompanying explanatory statement we receive 46 submissions.
- On 1 October 2013 we held a stakeholder forum to discuss our draft rate of return guideline. The forum provided interested stakeholders with an opportunity to clarify aspects of the draft guideline and to present their views on the draft guideline.
- On 11 October 2013, we released an issues paper on equity beta as part of our consultation for developing the rate of return guideline. This issues paper set out our proposed approach to estimating the equity beta. We received 14 submissions on this issues paper.
- In addition, we have held a number of bilateral meetings during the process with the QTC, TCorp, ERA, IPART, APIA, , EUAA, ENA, PIAC, Merrill Lynch, Moody's, Standard and Poor's, Goldman Sachs, Westpac. We also held a number of meetings with the Consumer Reference Group (customer group representatives) to receive feedback from on key issues from a consumer perspective.

We have published notes on key aspects of the discussions we had at the public forums. These can be found on our website at <http://www.aer.gov.au/node/18859>.

1.5 Implementation

This section outlines our approach on a number of issues arising from the implementation of the rate of return guideline.

1.5.1 Transaction costs and forecast inflation

We previously sought submissions from interested stakeholders regarding our proposed approach to allowing for debt and equity raising costs in the revenue building blocks. We also sought comments on the method we proposed to estimate forecast inflation.

As discussed with stakeholders, the final guideline does not cover our position on transactions costs or forecast inflation. These issues will need to be considered in upcoming determinations.

5.2 Amendments to the Post Tax Revenue Model

We will need to amend the PTRM to reflect the change to method of estimating the return on debt due to:

- Our proposal to estimate the return on debt using a trailing average portfolio approach and the proposal to annually update the return on debt allowance. Different return on debt inputs will be required in the WACC sheet each year within the regulatory period rather than a single return on debt input.
- The proposed gradual transitional arrangement from the current 'on the day' approach to the trailing average portfolio approach to estimate the return on debt. A new sheet is required for the calculation of weights to be applied to the estimate of return on debt during the transitional period.
- Different return on debt inputs for each regulatory year. This may require us to re-run the PTRM each regulatory year to update the annual building block revenue requirement and corresponding X factor for the relevant regulatory year.

The PTRM will need to be amended through a separate consultation process in accordance with the consultation procedures outlined in the rules.

1.6 Structure of this explanatory statement

This explanatory statement is structured as follows:

- Chapter 2 discusses our proposed approach to application of criteria for assessing the allowed rate of return.
- Chapter 3 discusses our proposed definition of benchmark efficient entity and compensation of risk.
- Chapter 4 discusses our proposed approach to estimating the overall return of return.
- Chapter 5 discusses the proposed approach to estimating the expected return on equity.
- Chapter 7 discusses our proposed approach to estimating the return on debt.

- Chapter 8 discusses our implementation of the estimated return on debt.
- Chapter 9 discusses our proposed approach to estimating imputation credits.

2 Application of criteria

This chapter discusses our understanding of the terms 'estimation methods, financial models, market data and other evidence' and how we propose to take this information into account in setting the allowed rate of return. We set out criteria that we propose to use to assess the merits of the various sources of information. This will help ensure that information is used in a manner that contributes to decisions which achieve the allowed rate of return objective.

2.1 Issue

The AEMC in its final rule determination considered that the estimation of the required rate of return could be improved by permitting us to take account of a broad range of information.¹⁶ The AEMC specifically did not include in the new rules any preferred methods for determining the rate of return.¹⁷ Instead it provided for the AER to exercise its judgement as to the best approach.¹⁸

Estimating the rate of return ultimately requires a regulator to exercise judgement about the analytical techniques and evidence to use to make an estimate that is commensurate with efficient financing costs. The new framework does not prescribe methodologies or lock-in specific benchmark characteristics other than providing high-level principles that should be taken into account when estimating various components, such as return on equity and debt. While the judgement as to the best approach is left to the regulator, the preferred methods must be developed to meet the overall allowed rate of [return] objective.

To guide our exercise of judgement the new rules specify that we must have regard to 'estimation methods, financial models, market data and other evidence' relevant to the assessment of the allowed rate of return.¹⁹ In this guideline we set out criteria that will assist our assessment of the various estimation methods, financial models, market data and other evidence and our exercise of judgement on the use of this information.

2.2 Approach

We propose to adopt a set of transparent criteria to assist our assessment of the various estimation methods, financial models, market data and other evidence to which we must have regard in our rate of return decisions. We used these criteria to assess these sources of information in developing this guideline. In future determinations we may also use these criteria to assess information presented during the determination that supports or departs from these estimation methods, financial models, market data and other evidence.

The criteria are subordinate to the law, the rules and the objectives. We anticipate that the criteria will improve the transparency, certainty and predictability of decision-making and contribute to decisions that achieve the allowed rate of return objective.

2.2.1 The criteria for assessing information

We consider that decisions on the rate of return are more likely to achieve the allowed rate of return objective if they use estimation methods, financial models, market data and other evidence that are:

¹⁶ AEMC, Rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012: National gas amendment (Price and revenue regulation of gas services) Rule 2012, 29 November 2012, p. 67 (AEMC, *Final rule change determination*, November 2012).

¹⁷ See, for example, AEMC, *Final rule change determination*, 29 November 2012, p. iv.

¹⁸ AEMC, *Final rule determination*, 29 November 2012, p. 38.

¹⁹ NER, cl. 6.5.2(e) and cl. 6A.6.2(e); NGR, r. 87(5).

- (1) where applicable, reflective of economic and finance principles and market information
 - (a) estimation methods and financial models are consistent with well accepted economic and finance principles and informed by sound empirical analysis and robust data
- (2) fit for purpose
 - (a) the use of estimation methods, financial models, market data and other evidence should be consistent with the original purpose for which it was compiled and have regard to the limitations of that purpose
 - (b) promote simple over complex approaches where appropriate
- (3) implemented in accordance with good practice
 - (a) supported by robust, transparent and replicable analysis that is derived from available credible datasets
- (4) where models of the return on equity and debt are used these are
 - (a) based on quantitative modelling that is sufficiently robust as to not be unduly sensitive to errors in inputs estimation
 - (b) based on quantitative modelling which avoids arbitrary filtering or adjustment of data, which does not have a sound rationale
- (5) where market data and other information is used, this information is
 - (a) credible and verifiable
 - (b) comparable and timely
 - (c) clearly sourced
- (6) sufficiently flexible as to allow changing market conditions and new information to be reflected in regulatory outcomes, as appropriate.

2.3 Reasons for approach

Estimating the allowed rate of return ultimately requires us to exercise judgement about the estimation methods, financial models, market data and other evidence (which we refer to collectively as 'information') to be used. The new rules framework does not prescribe any specific models or evidence to be considered or methodologies or frameworks to be used. This is left to the discretion of the regulator, subject to the requirement to determine a rate of return that achieves the allowed rate of return objective. The new framework provides considerable flexibility in determining the allowed rate of return. Also, the broad terms in the allowed rate of return objective mean that there may be several ways of practically implementing it. Therefore, we consider it helpful to set out criteria that will structure our consideration of various sources of information and how we propose to use this information to determine a rate of return. This will provide a greater degree of certainty and transparency for our future determinations. We also consider applying these criteria will ensure a robust approach and contribute to the achievement of the allowed rate of return objective

We draw a distinction, as the AEMC did, between the consideration of this information and the methodologies used, drawing upon this information, to determine the rate of return.²⁰

The criteria will assist us to evaluate the available information and its relevance to the determination of the rate of return in a structured, transparent and consistent manner. This feeds into the methodology set out within this guideline for the determination of the rate of return. As the AEMC acknowledged, this requires the exercise of judgement and discretion guided by the allowed rate of return objective. The methodology set out in this guideline guides, but does not constrain, the exercise of this discretion. The framework will provide greater consistency and transparency in the exercise of this discretion and contribute to the achievement of the allowed rate of return objective.

These criteria do not supplant the new rules. Rather, the criteria are subordinate to the law, the rules, and the objectives. We consider these criteria will provide stakeholders with greater certainty, and more importantly provide a framework, as to how we intend to exercise our regulatory judgment in respect of this information, while allowing us sufficient flexibility to make decisions in changing market conditions. Not all the various estimation methods, financial models, market data and other evidence will be of equal value in determining the efficient return on capital for the benchmark entity. For example, some information may be more relevant, more feasible to construct, or more reliable than others. The criteria will help us assess this.

The proposed approach to the consideration of information from estimation methods, financial models, market data and other evidence set out in this guideline reflects the use of these criteria. However, at the time of an individual service provider's determination, we will also use these criteria to assess information presented by that service provider that supports or departs from the methods, financial models, market data and other evidence set out in the guideline.

We received several submissions from stakeholders on the assessment criteria that were included in the consultation paper. Most submissions generally supported our proposed approach and criteria.²¹ For example, PIAC submitted that:²²

Important to achieving these outcomes is the use of well accepted models with sound theoretical and empirical support, fit for purpose and with internal consistency, along with reliable and well-defined data sets, and implemented appropriately for the circumstances. The AER has identified a similar set of criteria in the consultation paper and PIAC strongly supports this approach for the reasons outlined above.

However, some stakeholders expressed concerns and sought greater clarity from the guideline. Our draft report provided further explanation of the criteria and their use. In response to the draft guideline APIA expressed concern that we went beyond using the criteria to assess the relevance of the sources of information and used the criteria 'to assess the appropriateness of [the AER's] methods and methodologies for determining the rate of return for debt and equity in a way that effectively replaces the [allowed rate of return objective]'.²³ APIA proposed that the methods to be used in determining the rate of return must be assessed directly against the allowed rate of return objective

²⁰ NER, cl 6.5.2(n) and 6A.6.2(n); NGR, r. 87(14).

²¹ Australian Pipeline Industry Association Ltd, *Submission to the Australian Energy Regulator's rate of return guidelines consultation paper*, June 2013, p. 1 (APIA, *Submission on the consultation paper*, June 2013); Major Energy Users Inc, *Australian Energy Regulator, Better Regulation, Rate of return guidelines: Comments on the consultation paper*, June 2013, pp. 9–11 (MEU, *Comments on the consultation paper*, June 2013); The Financial Investor Group, *Response to the AER consultation paper: Rate of return guidelines*, 24 June 2013, pp. 13–14 (FIG, *Response to the consultation paper*, June 2013); Public Advocacy Centre Ltd, *Balancing risk and reward: Submission to the AER's consultation paper: Rate of return guidelines*, 21 June 2013, p. 4 (PIAC, *Submission on the consultation paper*, June 2013); Council of Small Business of Australia, *Australian Energy Regulator – Better Regulation program: Rate of return guidelines consultation paper: Comments*, 5 July 2013, p.5 (COSBOA, *Comments on the consultation paper*, July 2013).

²² PIAC, *Submission on the consultation paper*, June 2013, p. 4.

²³ Australian Pipeline Industry Association Ltd, *Meeting the ARORO? A submission on the Australian Energy Regulator's draft rate of return guideline*, 11 October 2013, p. 1 (APIA, *Submission to the draft guideline*, October 2013).

and that we had not done this in the draft guideline. The ENA expressed concern that ‘the potential for the criteria to conflict with the binding rule provisions and lead the AER into decisions inconsistent with the rules is in ENA’s view high’.²⁴ However, the ENA agreed that criteria can be used in assessing the quality and relevance of evidence.²⁵ In this final report we have clarified that the criteria will be used in the assessment of relevant sources of information and evidence on rates of return and that the use of the criteria will be subordinate to the law, the rules, and the objectives.

The APIA also set out some specific concerns in regard to some of the criteria. These concerns are addressed in section 2.3.2, which provides further explanation of our proposed criteria.

2.3.1 Estimation methods, financial models, market data and other evidence

The new rules require us to set out in the guideline:²⁶

1. The methods we propose to use.
2. The estimation methods, financial models, market data and other evidence we propose to take into account.

In determining the allowed rate of return, we must have regard to ‘relevant estimation methods, financial models, market data and other evidence’.²⁷

Our understanding of what these terms mean and how we may use them in determinations is discussed below. The criteria listed in section 2.2 provide a framework for assessing the relevance and quality of this information. We assess the return on equity models and information against these criteria in appendices A and B.

Estimation methods

We consider estimation methods to mean some processes or procedures used to compute an estimate of a parameter within a model or a component of the rate of return.

An example of an estimation method is the method we have previously used to estimate the risk free rate. To do so we have averaged the observed yield on 10 year Commonwealth Government Securities (CGS) over a defined period. Another example is the use of historical excess returns to inform the forward looking market risk premium (MRP) estimates in the CAPM.

We propose to use estimation methods to determine parameters, values or any other inputs to the rate of return where a financial model is not applicable, or to support a financial model.

Financial models

We consider financial model means an abstract representation of a financial decision-making situation. Examples of financial models include the Sharpe–Lintner CAPM, the Black CAPM, the Fama–French three factor model and the dividend growth model (DGM). These models are discussed in greater detail in appendix A.

²⁴ Energy Networks Association, *Response to the draft rate of return guideline of the Australian Energy Regulator*, 11 October 2013, p. 2 (ENA, *Response to the draft guideline*, October 2013).

²⁵ ENA, *Response to the draft guideline*, October 2013, pp. 14, 26, 44.

²⁶ NER, cls. 6.5.2(n), 6A.6.2(n); NGR, r.87(14).

²⁷ NER, cls. 6.5.2(e)(1), 6A.6.2(e)(1); NGR, r.87(5)(a).

The strength of financial models is that they provide a consistent and coherent framework for considering the rate of return and its components. We expect that financial models will continue to play a central role in the determination of the allowed rate of return. We will use financial models to estimate the return on equity. We may also use one financial model to estimate parameters within another financial model. An example might be using a DGM to estimate the MRP within the Sharpe–Lintner CAPM. Our previous use of the Sharpe–Lintner CAPM has rested upon its sound theoretical foundations and strong degree of acceptance and use in practice. Regulators in Australia and overseas have used this model, as well as capital market participants more generally.²⁸

Market data

We consider market data to include:

- prices, maturities, and terms and conditions of government and non-government bonds, financial derivatives, and other financial instruments
- equity prices and ratios, such as price earnings ratios and RAB multiples
- financial structures, such as gearing levels and credit ratings.

An example of market data is the data we have used in the past to determine the risk free rate. We have used data on the observed yield on 10 year CGS. Another example of market data is the data on corporate bond yields. These can be used to estimate the return on debt directly or cross-check estimates of the return on debt derived from other sources, such as the Bloomberg fair value curves.

We might use market data as inputs to estimation methods or financial models, or as alternative estimates and cross-checks of the outputs of those methods and models.

Other evidence

Examples of other evidence might include broker reports, experts' reports or feedback from market participants and stakeholders.

We might use other evidence at any point in the estimation of the rate of return, where we consider it will contribute to achieving the allowed rate of return objective. This may be as a cross-check on the overall WACC or return on equity estimates, or as a consideration when estimating a particular parameter value.

2.3.2 Assessment of proposed criteria

Reflective of economic and finance principles and market information (criterion one)

We consider economic and finance theory provides important insights into the conditions for achieving economic efficiency, including for the setting of revenue and prices for natural monopoly service providers. Economic theory also suggests economically efficient outcomes are in the long-term interests of consumers. This criterion is intended to draw on these theoretical insights to maximise the likelihood that regulatory outcomes would promote economic efficiency, and thus would achieve the allowed rate of return objective and the (national electricity and gas) objectives.

²⁸ See, for example, Grant Samuel, *Financial Services Guide and Independent Expert's Report in relation to the takeover offer by Pipeline Partners Australia Pty Limited - Appendix 2: Selection of discount rate*, 3 August 2012, p. 1.

This criterion is also intended to recognise that a sound and well-accepted theoretical foundation for a regulatory approach is highly desirable. This desirability was grounded within an interpretation of the objectives and their requirement for regulation to:²⁹

...promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect...to price, quality, safety, reliability and security of supply of electricity...

...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.

We consider the reference to 'economic' principles is important, as it relates to the achievement of efficiency, as set out above. It is less likely that other methods—that are not grounded in the concept of economic efficiency—would be as effective in achieving the objectives.

We consider that models, estimation methods, and other information that 'are well accepted' will help to deliver outcomes that achieve the allowed rate of return objective. The intention here is to ensure models and information well-grounded in economic theory will have greater recognition and acceptability, and be more likely to be widely used in the practical estimation of efficient financing costs. We consider this will, in turn, enhance the credibility and acceptability of a decision. The allowed rate of return objective requires us to set a rate of return commensurate with the efficient financing costs of the benchmark efficient entity.³⁰ We do not consider this to be only a theoretical proposition. Rather, it should be consistent with observable good practice in efficient businesses. We consider that, in practice, businesses make financing and investment decisions using widely accepted economic and financial models of the efficient cost and allocation of capital. To the extent that we use models for estimating the rate of return that are consistent with those widely used in practice, we are more likely to achieve the allowed rate of return objective.

Most stakeholders made no specific comments on this criterion. However, the APIA stated that 'the link [of economic principles to the NGO through] efficiency is not explicitly made and we doubt such a link can be made'.³¹ APIA considered that the NGO is concerned pragmatically with efficient investment and the long term interest of consumers.³² As noted above we consider that economic and finance principles provide practical guidance on the efficient cost and allocation of capital. This in turn guides efficient investment and the efficient allocation of resources more generally, both of which are in the long-term interests of consumers.

Fit for purpose (criterion two)

There are two aspects of this criterion: firstly, that the use of the information should be consistent with its original purpose and limitations; and, secondly, that simpler, less complex approaches should be preferred.

Some information may be of value in the determination of the rate of return, but its value may be diminished because it was constructed for a different purpose. For example, an investment fund may use a model of relative return for allocating investments within a fund. The primary purpose of such a model may be to distinguish between the relative return of different businesses within an industry sector rather than the estimation of the absolute return. That is, for its purpose it may be less sensitive

²⁹ NEL, section 7; NGL, section 23.

³⁰ NER, cls.6.5.2(c) and 6A.6.2(c); NGR, r.87(3).

³¹ APIA, *Submission to the draft guideline*, October 2013, p.5.

³² APIA, *Submission to the draft guideline*, October 2013, p.5.

to common parameters, such as the risk free rate. In contrast, we have to set an absolute value for the rate of return, for which these common parameters are quite important.³³

An important limitation of some of the information may be its past performance in forecasting returns or its robustness or sensitivity to assumptions. For example, dividend growth models can be quite sensitive to assumptions on growth in future earnings.³⁴ This factor is relevant to how the information from these models should be considered. Information that is considered less reliable may be considered qualitatively rather than quantitatively.

We prefer simpler over more complex approaches. This is because simpler models are more likely to be understandable, less prone to data mining and inappropriate correlation within the model and may have fewer data requirements. Accordingly, we consider simple models that perform as well as complex models should be preferred, all other things equal. This explanatory statement provides examples of how we intend to apply this criterion.

APIA submitted that there was no clear basis for consideration of fitness for purpose independently of the primary requirements of rule 87 of the NGR.³⁵ As discussed we consider that all the criteria for the exercise of regulatory discretion are subordinate to the law and the rules; hence, there is no scope for inconsistency. We agree with APIA that simple approaches must not be chosen simply as a matter of convenience.

Implemented in accordance with good practice (criterion three)

Information from estimation methods and models implemented in accordance with good practice will be preferred and given greater consideration. Such information is more likely to be reliable and result in consistent decision making in accordance with the allowed rate of return objective. By 'good practice' we mean that the information is supported by robust, transparent and replicable analysis, and derived from credible data sets.

We consider this criterion captures the notion of sound estimation approaches. It is consistent with the desirability of best-practice methods in achieving the allowed rate of return objective referred to by the AEMC.³⁶

Models based on quantitative modelling (criterion four)

Models will be preferred if they are based on sound quantitative modelling principles. For example, where models of the return on equity and debt are used, they are based on quantitative modelling that is sufficiently robust such that they are not unduly sensitive to errors in input estimation. We also propose that the models used should be based on quantitative modelling that avoids arbitrary filtering or adjustment of data that does not have a sound rationale.

The primacy of the allowed rate of return objective suggests where constituent components have been used to inform the overall rate of return estimate, these constituent components must be

³³ For example, under the CAPM the MRP is a common input for estimating the return on equity across different companies and sectors. A variation in the MRP, so long as it is consistently applied, will have a relatively small effect on the relative return on equity but will have a direct effect on the absolute value of the estimated return on equity.

³⁴ See Appendix E for further discussion of dividend growth models.

³⁵ APIA, *Submission to the draft guideline*, October 2013, p.6.

³⁶ AEMC, *Final rule change determination*, November 2012, pp. 42, 43, 56, 71.

estimated such that they contribute to the achievement of the rate of return objective.³⁷ These constituent components include the return on equity and return on debt.

We do not consider that robust outcomes from quantitative modelling necessarily prescribe a mechanistic interpretation. Rather, we consider that best practice statistical approaches would help to deliver robust estimates. To the degree that estimates are not robust or statistically sound, we need to take that performance into account in terms of making a judgment as to the effectiveness of that particular method.

Market data and other information (criterion five)

Where market data or other information is used, this information should be:

- credible and verifiable
- comparable and timely
- clearly sourced.

The intention of the above criterion is to ensure the empirical analysis and data supporting the estimation of the rate of return are employed in a sound manner.

Have the flexibility to reflect changing market conditions (criterion six)

The rate of return for the benchmark efficient entity will vary with changing conditions. In this context, the determination of the rate of return is more likely to achieve the allowed rate of return objective if it draws upon data that reflects changing market conditions and new information, where relevant. We consider this criterion would help to deliver the requirements of the law and the rules.

The rules refer to the need to have regard to prevailing market conditions when estimating the return on equity.³⁸ However, what is intended in this criterion is that relevant estimation methods are capable of capturing the relevant changes in prevailing market conditions or changes that have occurred over time. For example, a capable estimation method would be based on data that is updated on a timely basis. Such capability could assist the method to meet the requirement for the return on equity to reflect prevailing conditions in the market for equity funds.

.3.3 Application of proposed criteria

Table 2.1 summarises our application of the criteria in assessing the return on equity models and related information.

³⁷ The new rules require the use of a weighted average cost of capital, but this is subject to the requirement that the weighted average must contribute to the allowed rate of return objective (NER, cls. 6.5.2(d) and 6A.6.2(d); NGR, r.87(4)).

³⁸ NER, cl. 6.5.2(g) and cl. 6A.6.2(g) and NGR, r. 87(7).

Table 2.1 Application of criteria

Issue	Reference
Return on equity models	Appendix A
Return on equity (other information)	Appendix B
Sharpe–Lintner CAPM parameters	Chapter 6, and appendices C, D and E
Dividend growth models	Appendix E

Source: AER analysis.

3 Benchmark efficient entity and compensation for risk

This chapter outlines our proposed definition of the benchmark efficient entity. The definition of the benchmark efficient entity has implications for the estimated return on debt and equity (including the choice of data and models used to estimate the return on equity and debt).

3.1 Issue

The allowed rate of return objective requires that we set the rate of return for a distribution or transmission service provider which is commensurate with the efficient financing costs of a benchmark efficient entity. The benchmark efficient entity is to have a similar degree of risk as that which applies to the distribution or transmission service provider in respect of the provision of regulated services.³⁹

The AEMC provided for the possibility of more than one benchmark if there was not a similar degree of risk between the benchmark efficient entity and the network service providers.⁴⁰

In assessing whether more than one benchmark is required, we are directed to consider the risk characteristics of regulated energy network service providers in providing regulated services. We must assess whether the degree of risk exposure in providing regulated services is similar for the benchmark efficient entity and the regulated energy network service provider which is subject to the particular determination.⁴¹ In preparing our draft explanatory statement we sought advice from Frontier Economics on the risks to which regulated energy businesses are exposed in delivering regulated services.⁴²

This chapter outlines our considerations in making this assessment.

3.2 Approach

We propose to maintain our position in the draft guideline to:

- adopt a single benchmark across gas, electricity, transmission and distribution
- adopt a conceptual definition of the benchmark efficient entity that is 'a pure play, regulated energy network business operating within Australia'.

We have come to this view after further consideration of the issues and matters raised in submissions in response to the draft guideline.

Our approach to the implementation of the definition of the benchmark efficient entity is discussed in chapter 5 (for return on equity approach) and chapter 7 (for return on debt approach).

³⁹ NER, cls. 6.5.2(c), 6A.6.2(c); NGR, r. 87(2)(3).

⁴⁰ AEMC, *Final rule change determination*, 29 November 2012, p. 67.

⁴¹ In electricity distribution regulated services refers to standard control services, in electricity transmission it refers to prescribed transmission services and for gas distribution and transmission it refers to reference services.

⁴² Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, June 2013.

3.3 Reasons for approach

We consider that the risk exposure of the businesses we regulate, after taking into account the risk and the mitigating impact of the regulatory regime, is sufficiently similar to warrant the use of only one benchmark. We have reached this view for the following reasons:

- Differences in demand risk are mitigated by the regulatory regime through the revenue or price setting mechanism (form of control). In particular, under a revenue cap, where forecast quantity demanded differs from actual quantity demanded, in subsequent years price adjustments are made to enable the approved revenue to be received by the service provider. Further, in most cases, a transmission service provider will determine prices based on historical demand which reduces intra year revenue variations. This effectively mitigates the risk associated with demand volatility. Electricity transmission service providers are required to use a revenue cap.⁴³ We have indicated a preference for revenue caps.⁴⁴
- Under a price cap, service providers may mitigate the risk of forecast error by restructuring tariffs, such that higher fixed charges are set to offset demand volatility.
- Electricity distribution and gas service providers are able to propose the form of control they employ —revenue cap, price cap, or any variation thereof.⁴⁵ Service providers would be expected to choose the form of control which maximises its shareholder wealth. If a service provider chooses a price cap over a revenue cap it implies that any expected increase in cash flows must outweigh any expected increase in risk (that is, discount rate applied to the expected cash flows).
- With respect to competition risk, we considered that by virtue of being regulated, these service providers effectively face a very limited increase in risk due to competition.

We consider that it is generally accepted that the demand for gas and electricity is relatively inelastic.⁴⁶ With reference to price and income elasticities respectively, this means that prices or incomes have to change quite significantly for the end user to change the quantity of gas or electricity that they demand. We consider that, as a consequence of the inelasticity of demand and the slow technological change, changes in end user demand are generally likely to be small or business specific and to occur over a relatively lengthy period of time. 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.⁴⁷

In reaching these views, we considered the risks which service providers are exposed to in delivering regulated gas and electricity, transmission and distribution services. We divided these risks into business and financial risks and considered whether they were systematic or non-systematic risks. Under this framework we considered only those risks for which investors would require compensation through the rate of return, as opposed to those risks which are compensated through cash flows or those which do not require compensation at all.

Our starting point was that we consider the businesses we regulate have similar risks in delivering regulated services and to explore areas of likely difference. We consider this approach is justified

⁴³ NER, cl. 6A.4.2(a)(1).

⁴⁴ AER, *Discussion Paper: Matters relevant to the framework and approach, ACT and NSW DNSPs 2014–2019, Control mechanisms for standard control electricity distribution services in the ACT and NSW*, April 2012, p. 15.

⁴⁵ NER, cl. 6.2.5(b), NGR, r. 97(2).

⁴⁶ Bureau of Resource and Energy Economics, *Gas Market Report 2012*, Canberra, May 2012, p. 47.

⁴⁷ NER, cl. 6A.26. NGR, r. 96; NER, cls. 6.5.5(b)(1), 6A.6.3(b)(1), NGR, r.89(1).

given these businesses have similar business characteristics (that is, they operate in Australia, are regulated and belong to the same industrial sub-sector).

In the draft explanatory statement, we considered the risk drivers which may have the potential to lead to different risk exposures. The differences were considered in terms of any differences that may exist between gas and electricity and transmission and distribution. Submissions in response to the draft explanatory statement restated some of these risks. We continue to hold the view that there are two major drivers of risk including:

- the businesses' types of end user customer, their demand sensitivity, and the impact of the regulatory regime on regulated revenues
- the competition to which a business is exposed in providing reference services and the impact of this on risks that require compensation, primarily systematic risks.

These considerations reinforce our view that a single benchmark efficient entity is appropriate for all of the network businesses we regulate.

Below we have provided reasons for each aspect of our definition of the benchmark efficient entity.

Pure play

A pure play business is one which offers services focused in one industry or product area. In this context, it means that the benchmark efficient entity provides only regulated energy network services.

We consider that the benchmark efficient entity should be a pure play business as a business that offers services which are not related to regulated energy network services is likely to have a different risk profile.

Regulated

A regulated entity for the purposes of our benchmark is one which is subject to economic regulation (that is, revenue price cap regulation) under the National Electricity Rules and/or the National Gas Rules.

We consider that the benchmark efficient entity should be a regulated entity as:

- The rules require that the risks associated with the provision of regulated services are considered in determining the required rate of return.⁴⁸ As regulated services are delivered by regulated entities, it is logically consistent to consider the benchmark efficient entity as a regulated entity.
- Regulated service providers are typically not exposed to competition from other firms (in the case of distribution and some transmission businesses) or exposed to limited competition (in the case of regulated transmission businesses). The limited competition may alter the relevant (systematic) risk profile when compared with an unregulated firm.
- Regulated service providers are able to earn more stable cash flows relative to most unregulated businesses. These cash flows are regularly updated at resets to reflect required revenue (including changes due to shifts in demand and expenditure drivers) and therefore have similar business risks. Regulated service providers are also provided with some protection to their cash flows during regulatory control periods (e.g. pass through provisions and reopeners).

⁴⁸ NER, cls. 6.5.2(c), 6A.6.2.(c); NGR, r.87(2)(3).

- Regulated service providers may align their business practices to the regulatory regime. This may lead to a different risk exposure than that faced by an unregulated firm.

Energy network business

'Energy network' refers to a gas distribution, gas transmission, electricity distribution or electricity transmission business.

We consider that the benchmark efficient entity should be a regulated energy network business as:

- The rules refer to the regulation of energy transmission and distribution
- Different sectors of the economy are expected to have different characteristics which will lead to different risk profiles. By limiting the benchmark to energy network businesses we are limiting the possibility that risks will be dissimilar due to sectoral differences.

Implicit in the adoption of 'energy business' in the proposed definition of the benchmark efficient entity is that there is a single benchmark for gas distribution, gas transmission, electricity distribution and electricity transmission. We consider that the evidence available does not suggest that the risks are likely to be sufficiently dissimilar between gas distribution, gas transmission, electricity distribution and electricity transmission to justify more than one benchmark (see section 3.3.3).

Operating within Australia

We consider that the benchmark efficient entity should be operating within Australia as 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. 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.

Other issues

Parent ownership

Overall, we consider that, consistent with financing principles, the rate of return should be based on the non-diversifiable or systematic risks of the assets (i.e. regulated energy business) and not on the overall risk of the parent.

We consider that firms either with or without parent ownership can be used for estimating the return on capital. As long as the risk of the parent is likely to be consistent with the risk of the regulated business, the estimated required return of investors in the parent or the subsidiary should reflect the required return of investors in the regulated business.

Our current definition of the benchmark entity includes 'without parent ownership'. We have reviewed this component of the definition. This review was motivated by the practical observation that over time the ownership of regulated assets has evolved towards a conglomerate structure. Today all regulated energy entities in Australia have parent ownership. Furthermore, there is evidence that credit rating agencies consider the parent ownership in assessing ratings. Parent ownership presents a different risk profile to an assumption of no parent ownership. An example of this is where the parent is able to influence negotiations to secure good terms, which results in a material decrease in the network

entity's refinancing risk.⁴⁹ Frontier identified that efficiencies may be available to the parent via scale economies associated with largely fixed issuance costs, access to markets with minimum issuance size requirements, pooling of risk across subsidiaries achieving internal diversification, lowering default risk and so borrowing costs.⁵⁰

However, we consider that it is not possible to specify a single particular ownership structure which is "efficient." Therefore, we propose not to take a view on ownership structure in the definition of the benchmark efficient entity. We continue to hold this view.

Efficiency of the benchmark entity

We consider that the benchmark entity is efficient as it responds to the incentives provided by the regulatory regime. The objectives of the regulatory regime include setting incentives which promote economically efficient investment, provision of services and use of the transmission or distribution system.⁵¹ In relation to efficient financing practices, in our draft explanatory statement we said that:⁵²

We consider that in efficient capital markets, all firms operate on the capital frontier. All firms should be priced efficiently and able to access capital at the cost associated with the risks they face that are priced by investors (e.g. under CAPM this would be the systematic risk as measured by the CAPM beta associated with their business operations). Outperformance or underperformance relative to the frontier is reflective of firm specific factors which are not of concern to the regulator as these are not priced in capital markets and do not require ex-ante investor compensation. We note that we compensate transaction costs according to the size of the firm so as not to bias firms towards larger firm structures due to economies of scale that may be associated with raising capital.

We continue to hold this view.

Submissions in response to our draft explanatory statement:

- proposed an alternative framework for considering risk
- questioned our interpretation of efficiency in relation to the benchmark efficient entity
- re-stated or proposed new issues supporting separate benchmarks for gas and electricity
- considered that there should be a separate benchmark for government and privately owned entities.

We consider each of these issues, in turn, below.

3.3.1 Framework for considering risk

We consider that our starting position that the businesses we regulate have similar risks in delivering regulated services is justified given these businesses have similar business characteristics (that is, they operate in Australia, are regulated and belong to the same industrial sub-sector).

APIA submitted that the AER should start from a position of no similarity between the businesses' risk in providing regulated reference services and then group businesses under a benchmark when

⁴⁹ Moody's Investor Service, *Credit Focus, SP AusNet, SPI (Australia Assets) Pty Ltd and Jemena Limited: Frequently Asked Questions*, 22 May 2013.

⁵⁰ Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, June 2013, p. 40.

⁵¹ AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 17-18.

⁵² AER, *Explanatory statement: Draft rate of return guideline*, August 2013, p. 175.

similarity has been established.⁵³ It proposed a high level method for econometrically establishing the similarity of businesses.⁵⁴ The method requires the specification of a value for the deviation from the risk characteristics of the starting point business to allow for the grouping of businesses with a particular degree of similarity.⁵⁵ We do not accept APIA's submission. We consider that APIA's proposed high level econometric method for establishing the similarity of businesses would need to be operationalised before we could consider it. Our view is that the method raises the following issues:

- It is complex and it is likely to be data intensive
- There are likely to be significant issues regarding the establishment of a sufficient nexus between the data and the risk being proxied. Finding co-movement between data sets does not necessarily mean that the intended risk effects are being captured. There is a possibility that as a consequence of data mining, data used as proxy for risks would be used without a good theoretical basis. We note that this is akin to our reservations associated with using the Fama–French three factor model (see appendix A).
- As data on all risks is included it is likely to pick up many risks that are diversifiable and which do not require compensation under the assumption that investors hold fully diversified portfolios
- If a 'state of the world' and its consequence is to be interpreted across all businesses in a relative sense then coefficients from a system of equations, where all business relationships with the 'state of the world' are specified, would need to be jointly estimated, otherwise the error terms are not correlated. If the equations were separately estimated the coefficients would not reflect the relative influence of the particular risk across the businesses.
- In estimating the parameters, there are likely to be significant problems with multicollinearity and achieving statistically significant estimates⁵⁶
- For the above reasons, it is considered to be far too complicated for a regulatory benchmark and may not promote the achievement of the rate of return objective.

We consider that only those risks for which investors require compensation are relevant in determining a WACC. We provided detailed reasoning for this view in the draft explanatory statement. APA Group submitted that risks in general should be compensated. APA Group alluded to risks⁵⁷ which the AER considers are more appropriately factored into cash flows (for example, higher capex or opex allowances) rather than through the WACC. We reiterate our draft position in relation to the return on equity that:⁵⁸

[s]ystematic risk is the only risk that enters into the estimation of return on equity under the assumption that investors hold fully diversified equity portfolios. This is because it is only non-diversifiable risk that equity investors cannot manage.

With respect to the return on debt, we continue to hold our draft position in relation to return on debt. There we noted that to the extent that non-systematic risks cause an expectation of default the yield

⁵³ APIA, *Submission to the draft guideline*, October 2013, p. 14.

⁵⁴ APIA, *Submission to the draft guideline*, October 2013, pp. 16-20.

⁵⁵ APIA, *Submission to the draft guideline*, October 2013, p. 17.

⁵⁶ Multicollinearity results where variables move in a sufficiently similar or related way such that reliable attribution of impacts to a particular coefficient cannot be made. This means that the data does not explain the implied relationship at the chosen level of statistical significance.

⁵⁷ APA Group, *Submission to the draft guideline*, October 2013, p. 13. The example provided refers to businesses operating in higher risk environments (eg. pipelines within a major urban area versus operating in an area where there is minimal human habitation), which leads to higher operating costs.

⁵⁸ AER, *Explanatory statement: Draft rate of return guideline*, August 2013, p. 35.

to maturity will reflect this.⁵⁹ We consider that default risk is likely to be small for regulated energy networks. This is because they are protected from competition, which is why they are regulated, and these businesses have relatively stable cash flows.

The NSW Irrigator's Council submitted that the AER should reference competitive firms rather than regulated firms in defining the benchmark entity.⁶⁰ As stated in the draft explanatory statement, we consider that the benchmark efficient entity should reference regulated energy network businesses as:⁶¹

- The rules require us to consider the risks associated with delivering regulated services
- Regulated businesses are typically either not exposed to competition or exposed to limited competition. Regulated businesses are able to earn more stable cash flows relative to most unregulated businesses. Consequently, these factors may alter the relevant (systematic) risk profile of a regulated business when compared with an unregulated business.
- Regulated businesses may align their business practices to the regulatory regime. This may lead to a different risk exposure than that faced by an unregulated firm.

3.3.2 Efficiency of the benchmark entity

We consider that the benchmark entity is efficient as it responds to the incentives provided by the regulatory regime. In relation to efficient financing practices, we consider that in efficient capital markets all firms operate on the capital frontier. All firms should be priced efficiently and able to access capital at the cost which reflects the risks they face and which investors consider should be priced.

APA Group submitted that the AER has not reflected the rules requirement that the benchmark efficient entity is efficient in the conceptual definition of the benchmark efficient entity. It suggested that the AER use formal efficiency analysis using econometric techniques such as data envelopment or stochastic frontier analysis. It also pointed to the use of APIA's method to address efficiency.⁶²

Given our position on the efficiency of the benchmark firm, we disagree with this submission. We do not consider these are necessary for the purposes of defining the benchmark efficient entity. APA Group referred to APIA's method addressing its efficiency concerns.⁶³ It is unclear to us what specification APIA's method makes in relation to efficiency.

3.3.3 Consideration of energy sector risks and differing risk between gas and electricity entities

We consider the two major drivers of different risk exposures between gas and electricity and transmission and distribution are demand and competition risk. However, for the reasons outlined above, we consider that the net risk exposure of the businesses we regulate is sufficiently similar to warrant the use of only one benchmark.

⁵⁹ AER, *Explanatory statement: Draft rate of return guideline*, August 2013, p. 36.

⁶⁰ NSWIC, *Submission to the draft guideline*, October 2013, p. 5.

⁶¹ AER, *Explanatory statement: Draft rate of return guideline*, August 2013, p. 48.

⁶² APA Group, *Submission to the draft guideline*, October 2013, p. 11.

⁶³ APA Group, *Submission to the draft guideline*, October 2013, p. 11.

Some submissions supported this view. The MEU submitted that gas and electricity and transmission and distribution should be subject to the same approach for setting the rate of return.⁶⁴ PIAC stated that it agrees with using a single benchmark efficient entity to assess the rate of return across gas and electricity and transmission and distribution.⁶⁵

ENA considered that the AER has not recognised the 'significant confluence of technological, commercial and regulatory risks' to which network businesses are exposed.⁶⁶ We disagree with this submission. We considered the impact of technological change and the impact of the proposed regulatory regime in the draft explanatory statement.⁶⁷ We did not consider them to be material.

We noted in the draft explanatory statement that gas and electricity production technology is relatively mature and technological advances which are likely to have a meaningful impact on prices have been relatively slow to commercialise.⁶⁸ The area of greatest development is in large scale renewables. However, while we note that renewables are projected to increase significantly, the intermittency of generation requires that there is concomitant development of gas peaking load to provide system stability.⁶⁹ Rooftop PV is projected to account for only a small amount of total electricity generation in 2050. Grid connection is still likely to be required for emergency and peak use and for deriving feed-in revenue.⁷⁰ Furthermore, businesses are able to change their tariff structures to mirror the change in use profile associated with rooftop PV, moving towards a higher fixed cost based on connectivity and capacity and a lower consumption cost.⁷¹ There is also the potential for distributed solar PV to defer the requirement for network investment associated with peak demand by reducing maximum demand.⁷²

In the draft explanatory statement we considered the impact of the regulatory regime on the risks to which regulated businesses are exposed in delivering regulated services. We referenced our proposed approach to the new rules which will modify the risks to which regulated businesses are exposed.⁷³ The changes relate primarily to electricity businesses. They include:

- the introduction of an ex post review where inefficient capex above the allowance, related party margins and opex amounts reclassified as capex are able to be excluded from the regulatory asset base. We note that regulated gas businesses are already subject to this.⁷⁴
- Modification to the capital expenditure sharing scheme.⁷⁵ The AER is proposing to allow service providers to retain 30 per cent of any underspend during the regulatory control period and make service providers bear 30 per cent of any overspend.⁷⁶

In the draft explanatory statement we noted that businesses have the flexibility to reprioritise capex between activities. They also have the ability to delay more discretionary projects and re-propose those projects for funding in subsequent access arrangement periods.⁷⁷ For electricity network service

⁶⁴ MEU, *Submission to the draft guideline*, October 2013, p. 12.

⁶⁵ PIAC, *Submission to the draft guideline*, October 2013, p. 10.

⁶⁶ ENA, *Submission to the draft guideline*, October 2013, p. 3.

⁶⁷ ENA, *Submission to the draft guideline*, October 2013, p. 44-46; ENA, *Submission to the draft guideline*, October 2013, Table 3.1, p. 37-40 and pp.40-41.

⁶⁸ AER, *Explanatory statement: Draft rate of return guideline*, August 2013, p. 36.

⁶⁹ BREE, *Australian Energy Projections to 2049-2050*, Canberra, December 2012, Table 11, p. 41.

⁷⁰ Bain & Company, *Distributed energy: Disrupting the utility business model*, 2013, p. 1.

⁷¹ Bain & Company, *Distributed energy: Disrupting the utility business model*, 2013, p. 1.

⁷² BREE, *Australian Energy Projections to 2049-2050*, Canberra, December 2012, p. 45; Bain & Company, *Distributed energy: Disrupting the utility business model*, 2013, p. 3.

⁷³ AER, *Explanatory statement: Draft rate of return guideline*, August 2013, p. 37.

⁷⁴ NER, cls. S6.2.2A and S6A.2.2A; NGR, r. 77(2)(b).

⁷⁵ NER, cls. 6.4A and 6A.5A.

⁷⁶ AER, *Better Regulation: Final Capital Expenditure Incentives Guidelines*, December 2013, p. 7.

⁷⁷ AER, *Explanatory statement: Draft rate of return guideline*, August 2013, p. 164.

providers once the assets are included in the RAB, assets cannot be optimised out under the NER. We note that the proposed capital expenditure sharing scheme is symmetric—it rewards under spend as well as penalising overspend. It is also limited to 30 per cent. As businesses have a reasonable degree of flexibility in their expenditure and as there are rewards for underspending as well as penalties associated with overspending we do not consider that the new rules (and our proposed approach in applying those rules) will materially change the risk exposure compared with the former regulatory regime. This view is supported by Frontier Economics.⁷⁸

APIA, APA Group and Envestra stated that the AER has not taken account of a number of differences between gas and electricity. They consider these include:

- The differing impacts associated with the failure of a large customer which arises due to differences in the electricity and gas regulatory regimes.⁷⁹ In particular APIA and APA Group submitted that electricity transmission businesses, which are subject to a revenue cap, will not lose revenue, as the revenue is recovered from the residual customer base. APIA and APA Group stated that gas transmission businesses, which are subject to a price cap, incur the loss of revenue associated with the failed customer as they are unable to increase prices within the regulatory period. APIA stated that due to the prevalence of bilateral contracts (versus the use of reference tariffs) gas transmission businesses are unable to increase prices to other customers to cover the revenue loss. APA Group stated that the NER do not provide for a reduction in the regulatory asset base except for a reduction in dedicated connection assets while the NGR allow for the removal of redundant assets in subsequent regulatory periods.⁸⁰
- That while fuel switching may be limited (due to sunk costs), once a contract has been entered, major customers have significant market power resulting in both the customer and the energy business making significant sunk cost investment which both parties need to ensure is recoverable. APIA submitted that this results in favourable terms and risk minimising terms being negotiated by the customer.⁸¹
- That gas, as a fuel of choice, is subject to greater competition than electricity, which is an essential fuel. Envestra pointed to a 2006 report for the Ministerial Council on Energy, which was tasked with advising on a consistent approach to access pricing regulation across electricity and gas, transmission and distribution. It stated that gas is subject to more competition from substitutes.⁸²

We disagree with each of these points. Our reasons are below.

In relation to the first point, we consider that in order for the differential impact of large customer failure to be a consideration in determining a benchmark, we would need evidence of:

- past and expected future systematic customer failures across a particular business type in comparison with another business type (for example, gas transmission businesses on average have experienced a large customer loss more frequently than electricity transmission businesses over a reasonable period of time)

⁷⁸ Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia*, June 2013, p. 64.

⁷⁹ APIA, *Submission to the draft guideline*, October 2013, p. 11; APA Group, *Submission to the draft guideline*, October 2013, p. 12.

⁸⁰ We note that under the new rules there is provision for an ex-post review (NER s. S6.2.2A, s. S6A.2.2A)

⁸¹ APIA, *Submission to the draft guideline*, October 2013, pp.11-12.

⁸² Envestra, *Submission to the draft guideline*, October 2013, p. 5.

- the magnitude of the revenue impact associated with the large customer loss, relative to forecast or contracted revenues (to the extent that is related to non-diversifiable risk).

While there may be differential treatment afforded by the regulatory regime, it is the frequency and the magnitude of the revenue impact which will dictate whether this causes sufficiently different risk exposures between the business types as to warrant different benchmarks. We have not received any evidence of differences in the frequency and impact of large customer failure across service providers. Such would be necessary to enable us to accept these submissions. Furthermore we do not consider that the intent of the rules is to consider an individual businesses' contract risk, whereby risky contracting behaviour should have a separate benchmark to compensate for the risky behaviour. Indeed the NER provide guidance—where a transmission asset becomes redundant and amongst other provisions, the provider has not sought to reasonably allocate the risks of the value of the asset, it may be rolled out of the regulatory asset base.⁸³

In relation to the second point, we consider that the bargaining choices made by a business in distress⁸⁴ should not influence our assessment of risk. In the normal course of business, where there is a choice between electricity and gas suppliers, we expect that competition would be equally felt by both gas and electricity businesses. Furthermore, we would expect that an entity would only enter into a contract where it reasonably expected to recover its costs over the life of the asset. On this basis it is not clear how competition in advance of entering into a contract differentially affects the risk of a gas and electricity business.

In relation to the third point, we note that the quotes selected by Envestra were from a discussion on the appropriate form of regulation from full (price/revenue cap) to no regulation depending on the extent of market power which a business had in providing electricity and gas transmission/distribution services. One of the five factors assessed to contribute to market power was the presence of limited competition or substitutes for end-use gas or electricity services. Also discussed in this section of the report was that energy services are subject to 'some potential for users to shift consumption away from electricity or gas towards alternative fuels or other consumption areas altogether' and that '[s]hould the price of energy rise (including because of higher cost network services) such that consumers no longer find value in purchasing an additional unit, the most likely responses are either demand side management, in terms of reduced consumption, or a shift towards an alternative means of supply such as gas or embedded generation'.⁸⁵ We observe that where gas transmission pipelines are subject to sufficient competition as to ameliorate any market power, the transmission services provided using those gas transmission pipelines are not subject to regulation. This guideline relates to regulated gas transmission and distribution services. By virtue of being regulated, they are exposed to limited competition. In the draft explanatory statement we noted that the regulatory regime mitigates the differences in demand risk through the revenue or price setting mechanism (form of control). We stated that under a revenue cap, where forecast quantity demanded differs from actual quantity demanded, in subsequent years price adjustments are made to enable the approved revenue to be received by the service provider. Under a price cap, service providers may mitigate the risk of forecast error by restructuring tariffs, such that higher fixed charges are set to offset demand volatility. We reiterate, electricity distribution and gas service providers are able to propose the form of control—revenue cap, price cap, or any variation thereof—they employ.⁸⁶ We would expect service providers to choose the form of control which maximises its shareholder wealth. If a service provider chooses a

⁸³ NER s.6A.s.3(a)(3).

⁸⁴ As APIA describes the then position of DBP - see APIA, *Submission to the draft guideline*, October 2013, p. 12, footnote 9.

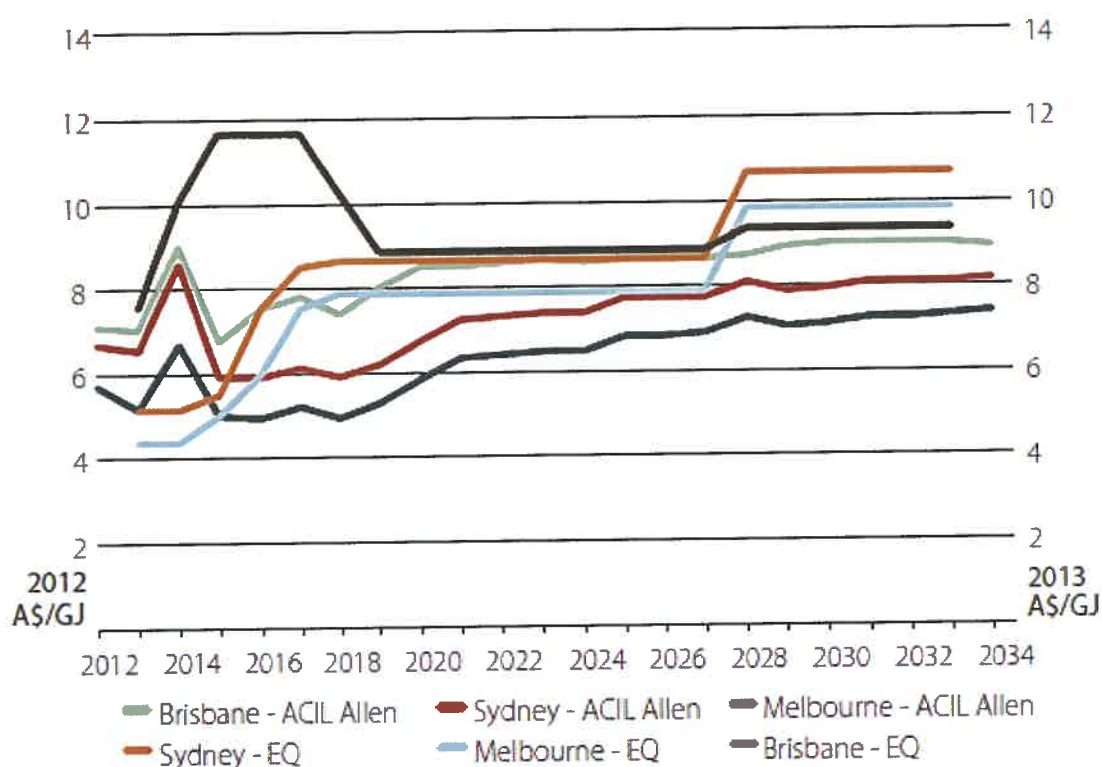
⁸⁵ Allen Consulting Group, *Expert panel on energy access pricing: Report to the Ministerial Council on Energy*, April 2006, p. 50.

⁸⁶ NER, cl. 6.2.5(b), NGR, r. 97(2).

price cap over a revenue cap it implies that any expected increase in cash flows must outweigh any expected increase in risk (i.e. discount rate applied to the expected cash flows).⁸⁷

Envestra, in response to our view that we consider material competition is likely to arise between gas and electricity use where there is a significant change in the relative price of gas and electricity which is viewed to be stable over the long term, raised that it does not consider the relative cost of gas to be stable in the short or medium term.⁸⁸ We note that gas prices are projected to increase temporarily around 2014 when Queensland LNG commences and then return towards production costs once the LNG projects reach capacity (see figure 3.1).⁸⁹ We consider that due to sunk costs associated with energy consumption, consumers will make fuel-switching decisions based on relative price expectations which are stable and over the longer term, rather than in response to shorter-term, uncertain price expectations.

Figure 3.1 Eastern market gas price projections, 2012 to 2034



Notes: ACIL Allen is the base scenario and is plotted on the left hand side. EQ is EnergyQuest's \$95 JCC scenario and is plotted on the right hand side.

Source: BREE, *Gas Market Report 2013*, October 2013, p. 43.

APIA submitted that the AER should consider US energy firms' asset betas in the absence of Australian data.⁹⁰ It stated that the US evidence indicates that gas transmission pipelines have a credit rating which is one notch below gas distribution, electricity transmission and distribution businesses and also have lower gearing and a lower EBITDA margin volatility. It stated that on an equal-gearing basis that gas transmission pipelines should be several notches below other energy

⁸⁷ AER, *Explanatory statement: Draft rate of return guideline*, August 2013, p. 43.

⁸⁸ Envestra, *Submission to the draft guideline*, October 2013, pp. 5-6.

⁸⁹ BREE, *Gas Market Report 2013*, October 2013, pp. 42-43.

⁹⁰ APIA, *Submission to the draft guideline*, October 2013, pp. 12-13.

firms. APIA also pointed to the asset beta range among the US firms considered by CEG (0.10 to 0.79) and the Australian firms considered by SFG (0.26 to 0.81) and questions how investors could conclude that the firms face similar risks.

Envestra submitted that electricity business are on average rated BBB+ while gas businesses are rated BBB, which indicated that gas businesses are riskier than electricity businesses. It stated that any perceived favourable aspects of the regulatory regime are not sufficient to offset the different risk profiles of gas and electricity businesses.⁹¹ However, we are not aware that rating agencies distinguish between electricity and gas networks. Indeed Moody's has stated that:⁹²

Unlike issuers covered by the Rating Methodology for Regulated Electric and Gas Utilities (August 2009), regulated networks have generally been separated from supply and generation activities ("unbundling"). As such, they are exposed neither to end-users nor to commodity price risk as they charge tariffs to suppliers for the transportation of electricity and gas that are independent of the commodity price.....Moody's would therefore see regulated electric and gas networks as exhibiting relatively low business risk, which in turn translate into a significant capacity to sustain high debt levels.

We do not consider that US energy firms are a suitable proxy for Australian firms and so do not consider that the asset beta information from US energy firms is able to be used to provide evidence for separate benchmarks.

We note that for the distribution and transmission businesses that the AER regulates SFG's beta estimates ranged between 0.26 and 0.65 (see table 3.1). We note that APA GasNet, which is involved in gas transmission, is towards the lower end of the range of beta estimates. It also appears that the electricity and gas and transmission and distributions businesses are distributed throughout the range. This data would seem to indicate that there is no clear difference between gas and electricity or transmission and distribution.

Table 3.1 SFG beta estimates for AER regulated entities

	β_{OLS}	β_{Vas}	β_{Re-g}
SP AusNet	0.26	0.29	0.27
Gasnet	0.29	0.36	0.30
DUET	0.59	0.61	0.36
Envestra	0.65	0.66	0.47
Spark	0.39	0.42	0.54

Source: SFG, *Regression-based estimates of risk parameters*, June 2013, Table 5, p. 18.

We consider on the evidence before us that any difference in risk is not material enough to warrant separate benchmarks. We consider that our benchmark WACC will provide a regulatory return that should be at least as high as the expected cost of capital of the average regulated network gas businesses.

⁹¹ Envestra, *Submission to the draft guideline*, October 2013, pp. 6-7.

⁹² Moody's, *Global Infrastructure Finance, Rating Methodology, Regulated Electric and Gas Networks*, August 2009, p. 40.

3.3.4 Consideration of the elements of the definition of the benchmark efficient entity

We propose to define the benchmark efficient entity as 'a pure play, regulated network energy business operating within Australia'. We consider that we are unable to conclusively determine a single efficient ownership structure. Therefore, we did not include any ownership specification in our proposed definition of the benchmark efficient entity. We note that the finance principle that the rate of return should be based on the non-diversifiable or systematic risks of the assets (that is, regulated energy business) and not on the overall risk of the parent should apply. Consistent with this principle, we consider that firms either with or without parent ownership can be used for estimating the return on capital, as long as the risk of the parent is likely to be consistent with the risk of the regulated business.

The MEU, COSBOA, and the Queensland Cane Growers Organisation submitted that the AER should have a separate benchmark entity for government-owned network service providers, reflecting the lower cost of debt which they face.⁹³

The Queensland Cane Growers Organisation submitted that government-owned service provider's should have a separate benchmark entity to reflect the different financing practices and risk between government-owned and private service providers.

We observe that there are different financing practices across businesses, both private and government-owned. We have outlined the benchmark financing strategy at section 7.3.3. These practices are only relevant to the extent that they inform our benchmark efficient financing costs.

We consider that the systematic risks are likely to be almost identical between government-owned and private service providers. With respect to the difference in default risk, in the draft explanatory statement we considered that according to Klein, the lower cost of debt for government-backed entities is underwritten by taxpayers, through the government's ultimate recourse to taxation. If taxpayers were compensated for the risk they assume for tax-financed projects, then no capital cost advantage would be conferred through government finance. The risk premium on government finance would, in principle, be no different to that of private investors.⁹⁴ Indeed setting a lower WACC for government-owned businesses could place an incentive on government to sell service providers because the service provider would be worth more to private investors (who would get the higher WACC) than to government (who get the lower WACC). This could incentivise asset sales even in the absence of any efficiency reasons for privatisation. We therefore do not consider that there should be a separate benchmark for government-owned entities on the basis of different risk exposure.

The MEU considered this view was misguided. It submits that service providers' boards make decisions in the interests of the service provider, referencing its own rate of return and the allowed rate of return, rather than in the interests of taxpayers as assumed by Klein. The MEU stated there is therefore an incentive to overinvest. The MEU stated that applying the Klein assumption, the higher cost of capital allowed for the service provider relative to the cost of the whole-of-government borrowing infers that government-owned service providers have a higher risk than other users of government funds. The MEU submitted that the opposite is true—that regulated networks have excellent security, underpinned by rules, where the primary risk for non-payment is carried by retailers

⁹³ MEU, *Submission to the draft guideline*, October 2013, pp. 8-10; COSBOA, *Submission to the draft guideline*, October 2013; Queensland Cane Growers Organisation, *Submission to the draft guideline*, October 2013, p. 5.

⁹⁴ AER, *Explanatory statement: Draft rate of return guideline*, August 2013, pp. 49-50.

and networks are able to increase prices to maintain their allowed revenues. It submitted that this revenue security is not available to other users of government debt (such as railways and hospitals).⁹⁵

The relevant issue in considering whether a government-owned business should have a lower benchmark rate of return compared to a privately-owned business is whether the relevant risks of the activity—investment in and operation of the energy networks is altered by government ownership. The MEU arguments addressed other issues, such as the comparison of risks and hurdle rates of return for general government capital expenditure and the costs of government-underwritten borrowing is less than that of the benchmark privately owned businesses. As the AEMC concluded:⁹⁶

If state-owned businesses issued their own bonds, without a government guarantee, they would face materially similar borrowing costs to privately-owned service providers. In the absence of competitive neutrality provisions, electricity consumers are unlikely to be better off from defining a separate benchmark for state-owned service. The most appropriate benchmark to use in the regulatory framework for all service providers, regardless of ownership in general, is the efficient private sector service provider.

⁹⁵ MEU, *Submission to the draft guideline*, October 2013, pp. 8-10.

⁹⁶ AEMC, *Final rule change determination*, November 2012, p. 72.

4 Overall rate of return

Under the rules, the allowed rate of return must be determined such that it achieves the allowed rate of return objective.⁹⁷ This includes that the allowed rate of return for a regulatory year must be:⁹⁸

- a weighted average of the return on equity for the regulatory control period in which that regulatory year occurs, and the return on debt for that regulatory year
- determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits.

4.1 Issue

This chapter focuses on the determination of the overall rate of return using the nominal vanilla weighted average cost of capital (WACC) formula.⁹⁹ This includes the following considerations relevant to the overall rate of return:

- our use of the nominal post-tax framework and the form of the WACC (section 4.3.1)
- intra-period adjustments (section 4.3.2)
- consideration of other information at the overall rate of return level (section 4.3.3)
- the term of the WACC (section 4.3.4).

Our approach to estimating the overall rate of return is largely consistent with our draft guideline. This approach is outlined in section 4.2, and was broadly supported by all stakeholders. Consumer groups, however, submitted that we should consider additional material to inform whether our estimate of the overall rate of return achieves the allowed rate of return objective. Service providers were more circumspect on the use of such material, and requested we provide further guidance on how regulated asset base (RAB) acquisition and trading multiples will be considered. The role of these multiples is discussed in section 4.3.3.

For clarity, several of the issues relevant to the overall rate of return are also relevant to both the return on debt and the return on equity. The primary discussion of these issues, therefore, is included in the corresponding return on debt and return on equity chapters and appendices.¹⁰⁰

4.2 Approach

Our approach to determining an allowed rate of return that achieves the allowed rate of return objective includes the following characteristics:

- it estimates the rate of return on a nominal vanilla basis, as a weighted average of the point estimates of the return on equity and the return on debt¹⁰¹
- the weight given to the respective point estimates of the return on equity and the return on debt is based on our gearing ratio point estimate

⁹⁷ NER, cl. 6.5.2(b), and 6A.6.2(b); NGR, r. 87(2).

⁹⁸ NER, cl. 6.5.2(d), and 6A.6.2(d); NGR, r. 87(4).

⁹⁹ A nominal vanilla WACC is the combination of a nominal post-tax return on equity and a nominal pre-tax return on debt. For example, the term for the return on debt is principally discussed in chapter 8.

¹⁰¹ NER, cl. 6.5.2(d), and 6A.6.2(d); NGR, r. 87(4).

- the term of our estimates of both the return on equity and return on debt is 10 years
- our estimate of the return on equity will be made at the start of the regulatory control period and then held constant across the regulatory control period, whereas our estimate of the return on debt will be updated annually

4.3 Reasons for approach

This section provides the reasoning for our approach, and discusses the context in which it was developed.

4.3.1 Nominal post-tax framework and the form of the WACC

The rules prescribe that we must use a nominal post-tax framework to determine building block revenues.¹⁰²

A nominal framework means that the building block revenue forecasts include estimates of expected inflation. This means that we estimate the revenue allowance in nominal dollar terms. In particular, when calculating the rate of return on capital building block we index the regulatory asset base each year by expected inflation. We multiply this by a nominal rate of return that also includes expected inflation. To ensure that the impact of inflation is properly accounted for (that is, not included more than once), we make a corresponding reduction to the depreciation calculation. This produces the regulatory depreciation building block.

A post-tax framework means that the estimated rate of return does not include compensation for the cost of corporate income tax. Instead, the overall building block allowance includes a separate tax allowance building block. To implement this framework, we use a 'nominal vanilla' WACC, which is a combination of a pre-tax return on debt and a post-tax return on equity. Conceptually, this post-tax return on equity includes the value of dividends, capital gains and imputation credits. We also adjust the corporate income tax allowance for the value of imputation credits to investors.¹⁰³

4.3.2 Intra-period adjustments

In previous determinations, we have set the overall rate of return by estimating a rate for the start of the regulatory control period, and holding this rate constant over the whole regulatory control period (usually five years). Further, our rate of return in previous determinations has been based on prevailing conditions in the market for funds at the commencement of the regulatory control period.

The rules now allow annual adjustments to be applied to the return on debt (if the regulator decides such an approach is appropriate).¹⁰⁴ This requires the formula for calculating the updated return on debt to be specified in the regulatory determination. The formula must also be capable of being applied automatically.¹⁰⁵

As discussed in greater detail in chapter 7, our approach to estimating the return on debt includes annual updates. Accordingly, our overall rate of return estimate will be updated annually.

¹⁰² NER, cl. 6.4.2, 6.4.3, 6A.5.3 and 6A.5.4; NGR, r. 76, 87A.

¹⁰³ However, the accumulation indices used in historical estimates of the market risk premium (MRP) only include the returns from capital gains and dividends. Therefore, in using historical estimates to inform our forward looking MRP value, we 'gross up' these estimates for the value of imputation credits. We discuss our approach to the estimation of the MRP in chapter 6 and appendix D. We discuss imputation credits further in chapter 9 and appendix H.

¹⁰⁴ NER, cl. 6.5.2(i), and 6A.6.2(i); NGR, r. 87(9).

¹⁰⁵ NER, cl. 6.5.2(i), and 6A.6.2(i); NGR, r. 87(12).

4.3.3 Other information potentially considered at the overall rate of return level

In our draft guideline, we proposed to continue using regulatory asset base (RAB) acquisition and trading multiples to provide reasonableness checks on the overall rate of return. On reflection, we have modified our proposed approach for this final guideline.

We now 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 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. We propose to continue to monitor RAB acquisition and trading multiples to inform us of market outcomes over time and in response to changes in the environment of the network businesses, without making use of them directly in the rate of return determination process.

PIAC has submitted that we should consider direct measures of the profitability of service providers.¹⁰⁶ For example, the comparative performance report for Victorian electricity and gas service providers included a comparison of returns on service providers' asset bases with the allowed regulatory returns. As stated in our consultation paper, however, the incentive framework limits the usability of comparisons based on actual rates of return.¹⁰⁷ For example, service providers are incentivised to outperform regulatory benchmarks for opex, capex, debt, tax and service performance. The ability for a service provider to earn an actual return on equity higher than the allowed return on equity, therefore, may be due to the outperformance of these benchmarks. Importantly, outperformance does not necessarily imply that the regulatory rate of return is incorrect.

4.3.4 Term of the WACC

The rules require us to have regard to the desirability of using an approach that leads to the consistent application of any estimates of financial parameters.¹⁰⁸ The rules, however, do not mandate a consistent term across the return on equity and return on debt. Rather, the rules enable us to consider whether a consistent term for both the return on equity and the return on debt is appropriate.

For the reasons discussed in chapter 8, we have adopted a 10 year term for the return on debt. The reasons for this term reflect the consideration of service providers' debt portfolios. Alternatively, the term for the return on equity is discussed below.

Return on equity term

The Australian Competition Tribunal (the Tribunal) decided in its 2003 GasNet decision that 10 years is an appropriate term of the risk free rate in the Sharpe–Lintner capital asset pricing model (CAPM).¹⁰⁹ In the consultation paper, we sought submissions from stakeholders on the appropriate term of equity in the consultation paper. Consistent with our draft guideline, we have adopted a 10 year term for the return on equity.

¹⁰⁶ PIAC, *Submission to the draft guideline*, October 2013, p. 26.

¹⁰⁷ AER, *Rate of return consultation paper*, May 2013, p. 88.

¹⁰⁸ NER, cl. 6.5.2(e)(2) and 6A.6.2(e)(2); NGR, r. 87(5).

¹⁰⁹ Australian Competition Tribunal, *Application by GasNet Australia (Operations) Pty Ltd [2003] ACompT 6*, 23 December 2003.

There are reasonable arguments to support either a 10 year term or a five year term for the return on equity. The case for a 10 year term emphasises the long term nature of cash flows in equity investment, in general, and the long lived nature of the assets in an infrastructure business (such as electricity and gas service providers), in particular. The case for a five year term emphasises the similarity in the cash flows between a regulated electricity or gas service provider subject to five year regulatory control periods and the cash flows of a five year bond with annual coupon payments.

The opinions of experts on this matter are mixed. Some experts support a 10 year term while others support a five year term.¹¹⁰

In this guideline, we have adopted a 10 year term for the return on equity. This is because:

- On balance, we are more persuaded by the arguments for a 10 year term, than the arguments for a five year term.
- We have adopted a 10 year term in past decisions.¹¹¹ Maintaining our previous position, in the absence of good reasons for change, promotes certainty and predictability in decision making.
- Maintaining a 10 year term avoids some practical complexities in the estimation of certain return on equity parameters (specifically, the MRP) that would result from a change from a 10 year to five year term.
- The difference in the overall rate of return between a 10 year and five year return on equity is unlikely to be material.

We elaborated further on these reasons in our explanatory statement accompanying the draft guideline.¹¹²

For the above reasons, maintaining a 10 year term for the return on equity promotes the allowed rate of return objective. In their submissions on the draft guideline, service providers supported maintaining a 10 year term for equity.¹¹³ We did not receive any submissions from consumer groups that commented on the term for equity.¹¹⁴

¹¹⁰ For example, Pratt and Grabowski (2010) and Damodaran (2008) both propose that, in general, an equity investment in an ongoing business is long term. They suggest, therefore, that for an ongoing business, the term of the equity should be measured as the duration of the long-term—and potentially infinite—series of cash flows. Both conclude that it is appropriate to use long term government bonds to estimate the return on equity, with Damodaran suggesting that 10 years is generally appropriate. Alternatively, Lally (2012) argues that a five year term is consistent with the present value principle—that the net present value (NPV) of cash flows should equal the purchase price of the investment. Lally stated that the present value principle is approximately satisfied only if the term of equity matches the regulatory control period. S. Pratt and R. Grabowski, *Cost of Capital: Applications and Examples*, 4th edition, 2010, pp. 118–120; A. Damodaran, 'What is the risk free rate? A search for the basic building block', December 2008, pp. 9–10. M. Lally, *The risk free rate and the present value principle*, 22 August 2012.

¹¹¹ See, for example: AER, *Access arrangement final decision APA GasNet Australia (Operations) Pty Ltd 2013-17, Part 2: Attachments*, March 2013, p. 54.

¹¹² AER, *Better regulation: Explanatory statement, Draft rate of return guideline*, 30 August 2013, pp. 181–184.

¹¹³ See, for example: ENA, *Response to the draft rate of return guideline of the Australian Energy Regulator*, 11 October 2013, p. 30; APA Group, *Submission on the Australian Energy Regulator's draft rate of return guideline*, 11 October 2013, p. 23; NSW DNSPs, *Submission on the rate of return draft guideline*, 11 October 2013, p. 18; Spark Infrastructure, *Response to the AER's draft rate of return guideline*, 11 October 2013, p. 4; APIA, *Meeting the ARORO? A Submission on the Australian Economic Regulator's draft rate of return guideline*, p. 1.

¹¹⁴ Some submissions from consumer groups commented on the term for the return on debt. The term for debt is addressed in chapter 8.

5 Return on equity: approach

To determine the allowed rate of return, the rules require that we have regard to relevant estimation methods, financial models, market data and other evidence.¹¹⁵ For the purpose of estimating the expected return on equity, this involves the consideration of a number of alternative models and information sources. The rules also require the rate of return guideline set out:¹¹⁶

- the methods we propose to use in estimating the allowed rate of return, including how those methods are proposed to result in the determination of a return on equity that is consistent with the allowed rate of return objective
- the estimation methods, financial models, market data and other evidence we propose to take into account in estimating the return on equity.

5.1 Issue

In this chapter, we outline the reasons for our proposed approach to determining a point estimate of the expected return on equity. Our proposed approach for estimating the expected return on equity uses the Sharpe–Lintner capital asset pricing model (CAPM) as our ‘foundation model’. Our foundation model estimate provides a starting point, and our final estimate of the expected return on equity has regard to a broad range of relevant material. In this context, a key question for the guideline is how to distil a range of information into a point estimate of the expected return on equity.¹¹⁷

This chapter also refers to a number of appendices linked to the estimation of the return on equity. These include:

- chapter 6 outlines our approach to the estimation of the risk free rate, equity beta and market risk premium (MRP)
- appendix A assesses relevant models against our criteria, and discusses the role of relevant models
- appendix B assesses other relevant material against our criteria, and discusses the role of other relevant material
- appendix C discusses our approach to estimating the equity beta in greater detail
- appendix D discusses our approach to estimating the market risk premium in greater detail
- appendix E discusses dividend growth models (DGMs) in greater detail.

Our proposed approach for estimating the expected return on equity is consistent with the approach outlined in our draft guideline. This approach was supported by consumer groups.¹¹⁸ Alternatively, submissions from service providers generally supported a multiple–model approach. The multiple–model approach, as proposed by the ENA and the APIA, estimates the expected return on equity by

¹¹⁵ NER, cls. 6.5.2(e)(1) and 6A.6.2(e)(1); NGR, r. 87(5).

¹¹⁶ NER, cls. 6.5.2(n) and 6A.6.2(n); NGR, r. 87(14).

¹¹⁷ In our consultation paper we stated that we would determine a single point estimate for the return on equity before estimating the rate of return.

¹¹⁸ See, for example: Public Interest Advocacy Centre, *Reasonably rated: Submission to the AER's draft rate of return guideline*, 11 October 2013; Major Energy Users Inc., *Better Regulation rate of return guidelines: Comments on the draft guideline*, 10 October 2013; Energy Users Association of Australia, *Submission to the draft AER rate of return guideline*, 11 October 2013.

combining different estimates from a number of complex models.¹¹⁹ The limited submissions from investor groups also supported a multiple-model approach, but generally, advocated a shift away from any view that investors require a fixed return over the risk free rate.¹²⁰

Our final explanatory statement expands on our draft explanatory statement to include greater detail regarding the implementation of relevant material. Notably, it includes input parameter estimates for our foundation model as of December 2013. Our decision to include input parameter estimates in this final explanatory statement follows submissions from stakeholders, particularly service providers, seeking greater certainty of process.¹²¹ We recognise that this certainty is important for promoting investment in network infrastructure.¹²²

More broadly, the development of our approach to estimating the expected return on equity has followed an extensive stakeholder engagement process. This has included public workshops following the publication of both our consultation paper and draft guideline. Similarly, we held multiple meetings with service providers, network infrastructure investors and consumer representatives (including the Consumer Reference Group). As outlined previously, the discussions with stakeholders have informed our approach, and the issues raised are outlined in detail in this chapter and related appendices. The engagement process for the return on equity has also led to the following consultant reports being commissioned:

- Professor McKenzie and Associate Professor Partington developed a report titled 'Risk, asset pricing models and WACC'.¹²³ This report discussed the merits of alternative models used to estimate the expected return on equity, and is reflected in the analysis in appendices A and B.
- McKenzie and Partington, and Professor Lally developed separate reports on the construction of DGMs.¹²⁴ These reports are discussed further in appendix E.
- Frontier Economics developed a report titled 'Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia'.¹²⁵ The analysis in this report, in particular the assessment of the risk profile of the provision of regulated services, was relevant to the estimation of the equity beta (in chapter 6 and appendix C).

5.2 Approach

Our proposed approach to determining a point estimate for the return on equity includes the following characteristics:

- It has regard to a broad range of relevant material.

¹¹⁹ The multiple-model approach is discussed in greater detail in section 5.3.10. See, for example: ActewAGL, *Response to draft rate of return guideline*, 11 October 2013; CitiPower, Powercor, SA Power Networks, *Submission to the draft AER rate of return guideline*, 11 October 2013; APA Group, *Submission on the Australian Energy Regulator's draft rate of return guideline*, 11 October 2013.

¹²⁰ Spark Infrastructure, *Response to the AER's draft rate of return guideline*, 11 October 2013, p. 4.

¹²¹ See, for example: NSW distribution network service providers, *Submission on the rate of return draft guideline*, 11 October 2013.

¹²² Spark Infrastructure, *Response to the draft guideline*, October 2013, p. 5.

¹²³ M. McKenzie and G. Partington, *Report to the AER: Risk, asset pricing models and WACC*, 27 June 2013.

¹²⁴ M. McKenzie and G. Partington, *Report to the AER: the Dividend Growth Model (DGM)*, December 2013; M. Lally, *Review of the AER's proposed Dividend Growth Model*, December 2013.

¹²⁵ Frontier Economics, *Assessing risk when determining the appropriate rate of return for regulated energy networks in Australia: A report prepared for the AER*, July 2013.

- Relevant material that may inform our estimate of the return on equity will be assessed against our criteria. This assessment will be used when we consider the merits and determine the role of relevant material in estimating the return on equity.
- The Sharpe–Lintner CAPM will be used informatively, rather than determinately, to provide the starting point estimate and range for the final return on equity. We describe the Sharpe–Lintner CAPM as our ‘foundation model’.
- Input parameter estimates for the Sharpe–Lintner CAPM will be informed by material including the Black CAPM and DGM estimates. We will also have regard to other theoretical and empirical evidence, including historical excess returns, survey evidence, implied volatility measures, other regulators’ MRP estimates, debt spreads and dividend yields.
- Regard will also be had to other information to determine the final return on equity point estimate. This includes an alternative implementation of the Sharpe–Lintner CAPM recommended by Professor Wright, and estimates of the return on equity from valuation reports, brokers and other regulators.¹²⁶
- Given the uncertainty inherent in estimating expected equity returns, the final return on equity estimate will reflect either the foundation model point estimate, or an alternative value that is a multiple of 25 basis points.¹²⁷

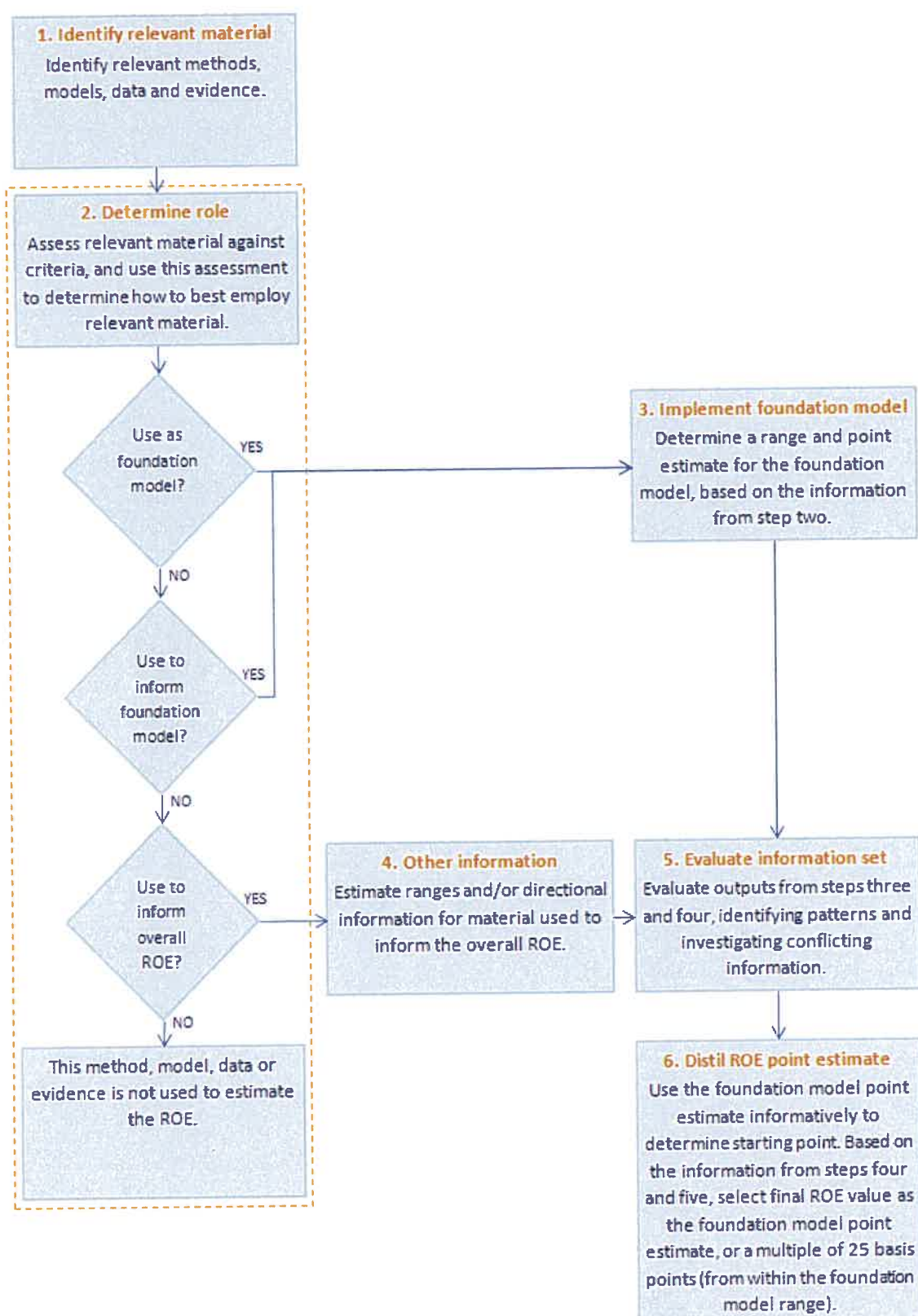
A flowchart outlining our approach is provided in figure 5.1. The implementation of this approach, and the reasoning underlying these steps, is discussed in greater detail in this chapter and in appendices A and B. We consider the information provided in our final explanatory statement will allow stakeholders to make a reasonable estimate of the return on equity that will apply at the time of a determination.¹²⁸

¹²⁶ During the Victorian gas access arrangement review, the Victorian gas service providers commissioned a report from Professor Stephen Wright. In this report, Wright proposed an alternative implementation of the Sharpe–Lintner CAPM for estimating the return on equity for the benchmark firm. See, for example: Wright, *Review of risk free rate and cost of equity estimates: A comparison of UK approaches with the AER*, October 2012.

¹²⁷ If the foundation model estimate is used, this estimate will be rounded to a single decimal point.

¹²⁸ For example, the inclusion on input parameter estimates for the Sharpe–Lintner CAPM should allow stakeholders to determine the starting point and expected range for the foundation model. Similarly, greater detail is provided regarding our implementation and use of the Wright approach, the dividend growth model, and expert valuation reports.

Figure 5.1 Flowchart of approach to estimating the return on equity



Source: AER analysis.

5.3 Reasons for approach

This section provides the reasoning for the development of our foundation model approach, followed by greater detail on the steps required to implement this approach. We also discuss the following:

- market practice for estimating the expected return on equity (section 5.3.3)
- regulatory judgement required to estimate the expected return on equity (section 5.3.4)
- role of our foundation model range (section 5.3.5)
- precision of expected return on equity estimates (section 5.3.6)
- stability of expected equity returns (section 5.3.7)
- development process and stakeholder engagement underpinning our approach (section 5.3.8)
- submissions from consumer groups, and alternative approaches proposed by stakeholders (section 5.3.9 and 5.3.10).

Further detail regarding our assessment and determination of the role of relevant material is provided in appendices A and B.

5.3.1 Development of our foundation model approach

In the development of our proposed approach for estimating the expected return on equity, we first considered four broad alternatives. These alternatives reflected the broad rules framework. Specifically, in our consultation paper we outlined the following four options:¹²⁹

- (1) Use one model to estimate the expected return on equity. This approach implied that the outcome of a single model is used to determine the return on equity. Other models would not form part of the estimation, and adjustments to the model outcome would not be made.
- (2) Use one primary model with reasonableness checks. Generally, it would be expected that the output from the primary model would be adopted as our estimate of the expected return on equity (as per option one). However, where the reasonableness checks suggested the output from the primary model was not reasonable, the expected return on equity would be determined based on regulatory judgement (informative use of primary model).
- (3) Use several primary models with quantitative but non-complicated fixed weighting. For example, this might entail the choice of two models with broad, simple weightings (such as 70:30).
- (4) Use multiple models and other information. The final return on equity would be determined based on regulatory judgment, taking into account the models and other information. No explicit weights would be provided, but models and other information could be given qualitative weighting (for example, 'most weight', 'less weight', and 'low weight').

In our consultation paper, we also discussed the merits of the four alternative approaches.¹³⁰ The key benefit of using a primary model is that it provides greater predictability of outcomes. At the extreme—that is, option one—stakeholders would be able to estimate the return on equity expected to be

¹²⁹ AER, *Consultation paper, Rate of return guidelines*, 10 May 2013, pp. 42–44.

¹³⁰ AER, *Rate of return consultation paper*, May 2013, pp. 42–44.

determined at the time of a determination with considerable accuracy. We also considered this option was transparent, replicable and simple to implement. This approach, however, may be too prescriptive.

Conversely, the other extreme—using multiple models and other information—draws on a range of material. This may reduce the significance of weaknesses in any one model or source of information. The limitations of this approach, however, is that it may be complex to implement (given multiple models must be estimated), and may not provide an appropriate level of predictability. A multiple model approach may also lead to inappropriate consideration being given to relevant material. These limitations are discussed in detail in section 5.3.10.

Using several primary models with quantitative but non-complicated fixed weighting shares many of the benefits and limitations of both options one and four, but to a lesser degree. Similar to option four, for example, it draws on a range of material and is complex to implement. Alternatively, similar to option one, it is predictable at the expense of flexibility.

Our proposed approach draws on elements from each alternative, but most closely resembles option two. For example, it draws on the key elements from a number of models, but recognises that all models are incomplete and that some approaches provide greater insight than others. For the following reasons, we consider this approach will deliver a robust estimate of the expected return on equity that will maximise the likelihood of our overall rate of return achieving the allowed rate of return objective:

- Using the foundation model and other information informatively (as opposed to determinately) to estimate the expected return on equity is consistent with the approaches adopted by market practitioners.¹³¹
- Using the foundation model and other information informatively acknowledges the inherent uncertainty in estimating the expected return on equity. That is, it recognises that all models are incomplete and that some approaches provide greater insight than others.
- Using the foundation model and other information informatively acknowledges the need for regulatory judgement in estimating the expected return on equity. Given the breadth of material and range of values that may represent reasonable estimates of the expected return on equity, the use of judgement is unavoidable.
- Using a foundation model approach is relatively simple to implement (particularly in comparison to combining different estimates of multiple models). For example, our foundation model—the Sharpe-Lintner CAPM—is a model that stakeholders are familiar with already (given its widespread use amongst market practitioners and other regulators).
- Using a foundation model approach may allow stakeholders to make reasonable estimates of the returns expected to be determined in advance of a determination. We consider that our proposed approach provides more guidance than the alternative of separately estimating and combining different models. As noted in stakeholder submissions, the guideline should provide certainty and predictability to assist investors in making their investment decisions.¹³²

¹³¹ See, for example: SFG, *Evidence on the required return on equity from independent expert reports: Report for the Energy Networks Association*, 24 June 2013; Ernst & Young, *Market evidence on the cost of equity: Victorian gas access arrangement review 2013–2017*, 8 November 2012.

¹³² See, for example: The Financial Investor Group, *Response to AER consultation paper: Rate of return guidelines*, 24 June 2013, p. 1.

- Using a foundation model, and drawing on other information to determine a final estimate of the expected return on equity, provides an appropriate balance between a relatively replicable and transparent process and providing flexibility in changing market circumstances. Such a process provides scope for engaging with the openness and flexibility of the rules within a broad structure.
- Using a foundation model and other information informatively, and selecting a final estimate of the return on equity that is a multiple of 25 basis points (if departing from the foundation model estimate), disavows the pursuit of false precision.
- Using the Sharpe–Lintner CAPM as the foundation model reflects our assessment of the model against our criteria. Specifically, we consider it is superior to alternative models (for the purposes of estimating the return on equity for the benchmark efficient entity).
- Our approach has also been developed in consultation with a range of stakeholders, including service providers and their industry associations, investors, and consumer groups. This engagement process is discussed in greater detail in section 5.3.8.

3.2 Our foundation model approach: step-by-step

To determine an estimate of the return on equity that is consistent with the allowed rate of return objective, we have adopted an approach based on a single foundation model. As summarised in section 5.2, this approach also draws on information and estimates from other relevant material. The reasons for adopting a foundation model approach are discussed in section 5.3.1.

Our approach represents a departure from the process undertaken during recent determinations. However, this approach is a result of the extensive stakeholder engagement for the development of this guideline. In particular, our approach draws on aspects of the four alternative approaches outlined in our consultation paper, as well as submissions from stakeholders. These alternative approaches, including those that combine direct estimates of multiple models (as proposed by both the ENA and APIA), are discussed in sections 5.3.1 and 5.3.10.

Step one: identify relevant material

The rules require us to have regard to all relevant estimation methods, financial models, market data and other evidence when determining our estimate of the return on equity for the benchmark efficient entity. The first step in our approach, therefore, is to identify the relevant material that may inform our estimate of the return on equity. Table 5.1 and table 5.2 list some of the material considered in this step.

We will, in accordance with the rules, have regard to all relevant material. However, this does not require us to use all of that material to inform our estimate of the return on equity.¹³³ Instead, we will use our assessment of the relevant material against the criteria to determine whether to use relevant material to inform our estimate of the return on equity. This assessment forms part of step two.

¹³³ This interpretation contrasts with submissions from the ENA and (to a lesser extent) the APIA. Specifically, the ENA submitted that our proposed approach was inconsistent with the rules as we proposed to not use specific material (for example, the Fama–French three factor model). The APIA shared the ENA’s concern that a foundation model approach may have legal implications in respect of meeting the NGR, but acknowledged that a foundation model approach may satisfy the economic intent behind the NGR. Energy Networks Association, *Response to the draft rate of return guideline of the Australian Energy Regulator*, 11 October 2013, p. 24; Australian Pipeline Industry Association Ltd, *Meeting the ARORO? A submission on the Australian Energy Regulator’s draft rate of return guideline*, 11 October 2013, p. 22.

Step two: determine role

Under step two, the relevant material (identified in step one) is assessed against our criteria. This applies a consistent framework for all material. This assessment is provided in appendices A and B.

The assessment of the relevant material against our criteria is further considered when determining where relevant material may inform our estimate of the return on equity. Specifically, we may use relevant material in one of four different ways:

(1) As the foundation model:

One possible use for relevant material under our approach is as the foundation model. As outlined in section 5.2, the foundation model is used to determine the starting point and expected range for our estimate of the return on equity. Given the prominence of the foundation model in our approach, it is critical that the model substantively meets our assessment criteria.

(2) To inform the estimation of parameters within the foundation model:

An alternative to using relevant material as the foundation model is to use such material to inform the input parameter estimates of the foundation model. Consistent with the current rules framework, this represents a balance between the assessment of relevant material against our criteria, and the desirability of drawing on the broadest range of evidence available.

(3) To inform where within the return on equity range (set by the foundation model) our 'final' return on equity point estimate should fall:

In addition to using relevant material as the foundation model, or to inform the foundation model parameters, relevant material may be used to inform the overall return on equity point estimate. This approach is consistent with using material where it is fit for purpose.

(4) Not used to estimate the return on equity:

The final category for consideration under step two is which relevant material will not be used for estimating the return on equity. This recognises that some material may not meet most of our assessment criteria, and/or may not be fit for the purpose of estimating the return on equity for the benchmark efficient entity.

Moreover, under our approach, relevant material will only be used once (to the extent practicable).¹³⁴ This avoids the potential for 'double counting' or unintended 'weight' to be assigned to a particular model or estimate. We consider this promotes transparency, and is consistent with our assessment criteria regarding the implementation of material in accordance with good practice.

Table 5.1 sets out our use of the relevant models identified in step one. We will use the Sharpe–Lintner CAPM as the foundation model, and the Black CAPM and DGM estimates to inform the Sharpe–Lintner CAPM input parameters. We propose not to use the Fama–French three factor model.

¹³⁴ It is recognised that some level of overlap of models and input evidence is unavoidable. For example, we propose to use other regulators' estimates of the return on equity, notwithstanding that other regulators may rely on much of the same material. Alternative implementations of a particular model may also be considered in multiple categories.

The reasoning and logic underlying this step is discussed in greater detail in appendix A. For example, the sensitivity of the Black CAPM to implementation variabilities limits the ability to use the Black CAPM as the foundation model. Theoretical and empirical evidence, however, supports using the Black CAPM, to some extent, in the process for estimating the return on equity. As such, we will use the Black CAPM to inform the selection of the equity beta.

Table 5.1 Role of relevant models

Material (step one)	Role (step two)
Sharpe–Lintner CAPM	Foundation model
Black CAPM	Inform foundation model parameter estimates (equity beta)
Dividend growth models	Inform foundation model parameter estimates (MRP)
Fama–French three factor model	No role

Source: AER analysis.

Table 5.2 sets out our proposed use of the other relevant material identified in step one. This includes information that we propose to use to inform foundation model input parameter estimates. It also includes material that we propose to use to inform our final estimate of the expected return on equity. For clarity, our use of debt spreads and dividend yields has changed from that outlined in the draft guideline. The reasons for this change are outlined in appendix D.

Table 5.2 **Role of other relevant information**

Material (step one)	Role (step two)
Commonwealth government securities	Inform foundation model parameter estimates (risk free rate)
Observed equity beta estimates	Inform foundation model parameter estimates (equity beta)
Historical excess returns	Inform foundation model parameter estimates (MRP)
Survey evidence of the MRP	Inform foundation model parameter estimates (MRP)
Implied volatility	Inform foundation model parameter estimates (MRP)
Other regulators' MRP estimates	Inform foundation model parameter estimates (MRP)
Debt spreads	Inform foundation model parameter estimates (MRP)
Dividend yields	Inform foundation model parameter estimates (MRP)
Wright approach	Inform the overall return on equity
Takeover/valuation reports	Inform the overall return on equity
Brokers' return on equity estimates	Inform the overall return on equity
Other regulators' return on equity estimates	Inform the overall return on equity
Comparison with return on debt	Inform the overall return on equity
Trading multiples	No role
Asset sales	No role
Brokers' WACC estimates	No role
Other regulators' WACC estimates	No role
Finance metrics	No role ¹³⁵

Source: AER analysis.

Step three: implement foundation model

As outlined in step two, our approach adopts the Sharpe–Lintner CAPM as the foundation model. The role of the Sharpe–Lintner CAPM, and the inclusion of only one model as a foundation model, reflects

¹³⁵ As discussed in detail in appendix B, we consider that finance metrics may prove useful in our decisions. However, at this stage we have not formed a view on how these tests should be applied. Therefore, we do not propose these tests in our final guideline.

our assessment of the models against the criteria.¹³⁶ The estimation of the Sharpe–Lintner CAPM input parameters, including the role of information used to inform these estimates, is discussed in greater detail in chapter 6 and appendices A, C and D. In summary, we propose to implement the Sharpe–Lintner CAPM as follows:

- The Sharpe–Lintner CAPM will be estimated as the sum of the risk free rate, and the product of the equity beta and MRP.
- The risk free rate will be estimated with regard to Commonwealth government securities. Given yields on these securities are readily observable, only a point estimate (and not a range) for the risk free rate will be determined. The method for estimating the risk free rate is set out in the guideline, with the actual point estimate determined during the determination process.
- The equity beta range will be estimated with regard to theoretical and empirical evidence—based on the observed equity beta for a comparator set of Australian energy networks, cross checked against overseas energy networks.
- The equity beta point estimate will be determined based on regulatory judgement, having regard to the theory underpinning the Black CAPM and regulatory precedent (as discussed in appendix C).
- The MRP range will be estimated with regard to theoretical and empirical evidence—based on evidence such as historical excess returns, survey evidence, financial market indicators, estimates from other regulators, and DGM estimates.
- The MRP point estimate will be determined based on regulatory judgement, taking into account estimates from each of those sources of evidence (as discussed in appendix D).
- The range and point estimate for the return on equity will be calculated based on the range and point estimates from the corresponding input parameters. For example, the lower bound of the return on equity range would be calculated by applying the point estimate for the risk free rate and the lower bound estimates for the equity beta and MRP.

For clarity, the use of ranges and point estimates for the equity beta, MRP and the return on equity reflects the inherent uncertainty in determining precise estimates for these values.

Step four: other information

Under step four, other information that may inform our final return on equity point estimate is considered. This material was outlined in table 5.2, and is further explained in appendix B.

The manner in which we may use other information, however, may differ for each alternative source. Specifically, some of the other information may provide a range (at a point in time) for the return on equity, while others may provide only directional information.¹³⁷ In this context, directional information refers to the relativity of current estimates to a baseline value. For example, directional information may inform how the current estimate of a particular source of information differs from the corresponding estimate observed in other recent determinations. In some cases, the information source may also suggest a rough magnitude (as well as a direction). That is, an explanation may be that a given directional indicator has increased since the most recent determination, though not by a

¹³⁶ See appendix A for our assessment of the models against our criteria.

¹³⁷ A relative assessment will also be considered for the comparison of the return on equity with the return on debt. As discussed in appendix B, the return on equity is expected to be above the return on debt.

large amount. This may suggest that the return on equity should also have increased since the most recent determination, though not by a large amount.

Table 5.3 outlines the manner of use for each source of information we propose to use to inform our final estimate of the return on equity. Similar to step two, the form of alternative estimates will be guided by an assessment against our criteria. For clarity, the form of takeover and valuation reports has changed from that outlined in the draft guideline. As outlined in appendix B, we consider takeover and valuation reports provide estimates of the expected return on equity for a broad range of businesses. Alternatively, the Wright approach, and other regulators and brokers provide more direct estimates of the expected return on equity for service providers.

Table 5.3 Form of other 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 and valuation reports	Directional
Comparison with return on debt	Relative

Source: AER analysis.

Step five: evaluate information set

This step requires the evaluation of the full set of material that we propose to use to inform, in some way, the estimation of the expected return on equity. This includes assessing the foundation model range and point estimate alongside the other information from step four.

In evaluating the full information set, the consistency (or otherwise) of the information is expected to be important. That is, circumstances where most of the other information suggests the return on equity should be above the foundation model estimate is likely to be more persuasive than if only a single estimate suggests an alternative value. The strengths and limitations of each source of additional information, however, will also be an important factor guiding the informative value of the available material. These strengths and limitations, as assessed against our criteria, are discussed in greater detail in appendices A and B.

Step six: distil a point estimate of the expected return on equity

Our approach requires the determination of a single point estimate for the return on equity. As outlined in section 5.2, our starting point for estimating the return on equity will be the foundation model point estimate. Moreover, the final point estimate is expected to be selected from within the foundation model range.

The final estimate of the expected return on equity, however, will ultimately require the exercise of regulatory judgement. This judgement will draw on the analysis of the other information provided in step five. For example, we may determine an estimate of the return on equity that is higher (lower) than the foundation model estimate where the other information indicates a higher (lower) return is

appropriate. As noted in section 5.2, the relative strengths and limitations of each source of other information, as well as the consistency of this information, will be important.

The use of regulatory judgement may also result in a final estimate of the return on equity that is outside the foundation model range. This recognises that, ultimately, our rate of return must meet the allowed rate of return objective. In these circumstances, 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. Specifically, the uncertainty inherent in estimating input parameters has led to ranges for the equity beta and MRP that are not particularly narrow. The corresponding range for the return on equity, given these input parameter ranges, is necessarily wider.

Further, under our approach, if the foundation model point estimate is not adopted the final estimate of the return on equity will be determined as a multiple of 25 basis points. This recognises the limited precision that the return on equity can be estimated. It is also consistent with our approach of only using the foundation model informatively.¹³⁸ The reasoning for this approach is discussed in greater detail in section 5.3.6. The selection of the final estimate of the return on equity as a multiple of 25 basis points, however, should not be interpreted as a rounding exercise. Instead, the analysis in step five will inform the direction and magnitude of the departure from the foundation model point estimate.

5.3.3 Market practice for estimating the expected return on equity

As described in section 5.2, we propose to estimate the expected return on equity using the Sharpe–Lintner CAPM as our foundation model. Our estimate of the expected return on equity, however, has regard to the limitations of the Sharpe–Lintner CAPM. Specifically, it considers other information to determine our Sharpe–Lintner CAPM input parameters. It also considers other information to determine our final estimate of the expected return on equity. For the following reasons, we consider this approach to estimating the expected return on equity is consistent with the broad approach adopted by many market practitioners:

- In a report commissioned by the ENA, SFG examined evidence on the approaches for estimating the expected return on equity adopted in independent expert reports. SFG stated that in half of the reports it reviewed, the expected return on equity was estimated by first using the Sharpe–Lintner CAPM, and then applying a specific uplift factor. This uplift factor was adopted to address perceived shortcomings in the Sharpe–Lintner CAPM estimates.¹³⁹
- SFG also referred to a similar report prepared by Ernst & Young that was submitted to us during the Victorian gas access arrangement process. In this report, Ernst & Young stated that independent expert reports often use the Sharpe–Lintner CAPM to estimate the cost of equity, but typically exercise discretion in the application of the model.¹⁴⁰

Conceptually, we consider the approaches outlined by SFG and Ernst & Young are very similar to our foundation model approach. That is, both approaches use the Sharpe–Lintner CAPM informatively, and consider other information to address any limitations inherent in the estimate. In contrast, we are not aware of any practitioner that determines estimates of the expected return on equity by combining

¹³⁸ That is, using the foundation model informatively, and determining a final estimate of the return on equity with regard to additional information, acknowledges a level of imprecision.

¹³⁹ SFG, *Evidence on the required return on equity for the ENA*, June 2013, pp. 1–2.

¹⁴⁰ Ernst & Young, *Market evidence on the cost of equity*, November 2012, p. 9.

different estimates from each of the Sharpe–Lintner CAPM, Black CAPM, Fama–French three factor model, DGM and arbitrage pricing theory.¹⁴¹

5.3.4 Regulatory judgement

Under the rules, we must have regard to relevant estimation methods, financial models, market data and other evidence when estimating the return on equity. However, this does not mean that we will use all that material in reaching our decision. Nor does this mean we will give equal (or any) regard to particular sources of evidence. The use of regulatory judgement in estimating the return on equity is unavoidable, given the nature of the evidence. This was acknowledged by the AEMC, and in submissions from stakeholders. For example, the AEMC stated that we:¹⁴²

...must make a judgement in the context of the overall objective as to the best method(s) and information sources to use, including what weight to give to the different methods and information in making the estimate.

The ENA also stated that:¹⁴³

...there is an inherent element of judgement involved in factoring in all the relevant evidence.

Our approach requires regulatory judgement throughout the process, including in the development of the rate of return guideline. In particular, our approach requires judgement to:

- determine the set of relevant material
- assess the relevant material against our criteria
- determine the role for all relevant material, based on our assessment against the criteria
- determine input parameter estimates from the relevant material
- determine a range and point estimate for the return on equity from our foundation model
- distil a final estimate of the return on equity from a range of alternative estimates.

The application of regulatory judgement must also be accompanied by an appropriate level of reasoning. There may be a limit, however, to the extent that any reasoning definitively points to a single estimate or outcome. For example, suppose we adopted an approach that applied quantitative weights to two alternative models. In these circumstances, the nature of the evidence means that we would be unable to show that a weighting of 60 per cent on one model and 40 per cent on another was the ‘best’ outcome (relative to, for example, an alternative weighting of 55:45 or 65:35 per cent). Rather, we would demonstrate that our preferred approach is reasonably open to us on the evidence before us.¹⁴⁴ For example, in the context of the MRP, the Tribunal has identified that there was:¹⁴⁵

no settled view among the experts as to what is the best methodology to employ in coming to such a conclusion... [and] substantial debates among the experts, as well as the parties, as to how particular

¹⁴¹ Combining different estimates of multiple models reflects the approaches proposed by the ENA and the APIA. For clarity, the Ernst & Young report stated that some experts assess the estimates obtained from the application of the Sharpe–Lintner CAPM with the values obtained using other methods. However, the other methods listed are not nearly as extensive as the list of relevant models proposed by the ENA and APIA. See, for example: Ernst & Young, *Market evidence on the cost of equity*, November 2012, p. 9.

¹⁴² AEMC, *Rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012: National gas amendment (Price and revenue regulation of gas services) Rule 2012*, 29 November 2012, p. 67.

¹⁴³ ENA, *Response to the AER's rate of return guidelines consultation paper*, 28 June 2013, p. 70.

¹⁴⁴ Application by Envestra Limited (No 2) [2012] ACompT 3 (11 January 2012) at [145].

¹⁴⁵ Application by Envestra Limited (No 2) [2012] ACompT 3 (11 January 2012) at [143].

methodologies should be employed and the nuances and assumptions that are necessary for their effectiveness.

The MRP is an example of a decision where we are faced with evidence supporting a range of alternative outcomes. In such circumstances, we exercise our regulatory judgment to determine a reasonable approach that is open on the evidence.

5.3.5 Foundation model range and point estimate

As outlined above, our approach uses regulatory judgement to determine input parameter estimates for our foundation model from a range of relevant material. This leads to a foundation model range, from which we expect to select our final estimate of the return on equity.

The ENA submitted that, dependent on the width and rigidity of this range, our approach may limit the weight given to relevant material.¹⁴⁶ For example, if the final point estimate of the return on equity was selected from within the foundation model range, the influence of alternative models would be limited to selecting an estimate from the top of our range. If this range is narrow, therefore, the influence of alternative models on our return on equity estimate may be limited. Similarly, the ENA stated that a problem with the foundation model range is that the weight placed on different pieces of evidence diminishes the further these estimates are from the boundaries of the range.¹⁴⁷

We consider, however, that the Sharpe–Lintner CAPM is superior to the alternative return on equity models. This is discussed in greater detail in appendix A. It is logical to expect, therefore, that in most circumstances our final estimate of the expected return on equity will be close to the foundation model point estimate. Moreover, as stated in section 5.3.2, we consider it reasonable to expect our final return on equity estimate, in most market circumstances, to fall within the foundation model range. Specifically, the uncertainty inherent in estimating input parameters has led to ranges for the equity beta and MRP that are not particularly narrow. The corresponding range for the return on equity, given these input parameter ranges, is necessarily wider.¹⁴⁸

5.3.6 Precision of estimates

Our approach also recognises that estimating the rate of return for a service provider is not a precise science. In particular, the expected return on equity is not observable. As stated by the APIA, estimates of the return on equity will be:¹⁴⁹

...approximations to unknown true values, and must be determined through the application of relevant theory and practice.

The application of relevant theory and market practice, however, may not necessarily result in the determination of precise estimates. Notably, all financial models are a simplification of the real world to allow us to draw insights into key relationships and determinants. Our approach draws on the key elements from a number of models, but recognises that all models are incomplete and that some approaches provide greater insight than others. In this context, we consider there is a limit to the specificity for which estimates of the return on equity can be determined. Accordingly, under our approach, we only use model estimates informatively.

Our approach further recognises the limited specificity for which estimates of the return on equity can be determined. It does so by only selecting estimates of the expected return on equity as multiples of

¹⁴⁶ ENA, *Response to the draft guideline*, October 2013, pp. 16–18.

¹⁴⁷ ENA, *Response to the draft guideline*, October 2013, pp. 18–19.

¹⁴⁸ For clarity, this does not mean that every value within our foundation model range is equally likely.

¹⁴⁹ APIA, *Submission to the draft guideline*, October 2013, p. 44.

25 basis points (if departing from the foundation model estimate). In reaching this view, we considered four alternatives, including determining the return on equity:

- (1) To two decimal places.
- (2) To one decimal place.
- (3) To a multiple of 25 basis points.
- (4) To a multiple of 50 basis points.

We consider that determining estimates of the expected return on equity as multiples of 25 basis points is reasonable, as the nature and breadth of the task before us does not support finer gradations. Notably, as discussed in section 5.3.4, the material we intend to consider spans a wide range of potential values and may not lead to single, definitive outcomes.

The ENA, however, stated that 'rounding' will always lead to an estimate which is worse than the best estimate.¹⁵⁰ The ENA also stated the final return on equity is a mathematical outcome from making a series of decisions throughout the estimation process.¹⁵¹

We disagree with the ENA's view. We consider that the ENA's discussion of a 'best estimate' misses the fundamental point. That is, the expected return on equity for the benchmark firm is unobservable.¹⁵² There is, therefore, no single correct estimate of the expected return on equity. Similarly, the ENA's statement implied that the determination of our final estimate of the expected return on equity should be a mechanistic process. This is contrary to the view that the ENA expressed during the public forums. Moreover, the current rules, in particular the requirement to achieve the allowed rate of return objective, are structured to avoid such mechanistic approaches.

We have also considered the materiality of determining estimates of the return on equity as multiples of 25 basis points. For example, a 25 basis point difference in estimates of the return on equity would result in a 10 basis point difference in the overall rate of return (based on our gearing estimate). This is expected to translate to revenue differences of less than one per cent.¹⁵³ We consider, therefore, that choosing a value as a multiple of 25 basis points (if departing from the foundation model estimate) appropriately balances the imprecise nature of the task before us with the materiality of our decision.¹⁵⁴

5.3.7 Stability of the expected return on equity

In our consultation paper, we stated that a relatively stable regulatory return on equity would have two effects:

- It would smooth prices faced by consumers.

¹⁵⁰ ENA, *Response to the draft guideline*, October 2013, p. 20.

¹⁵¹ ENA, *Response to the draft guideline*, October 2013, p. 20.

¹⁵² See, for example: Wright, *Review of risk free rate and cost of equity estimates: A comparison of UK approaches with the AER*, October 2012, p. 2.

¹⁵³ For example, using the published post-tax revenue models from a sample of service providers (ElectraNet, Powerlink, Envestra (Victoria) and Aurora), the respective revenue impacts of a 25 basis point change in the return on equity ranges from 0.7 to 0.9 per cent.

¹⁵⁴ The Council of Small Business Australia proposed that multiples of 10 basis points would be preferable. We consider, however, that the nature and breadth of the task before us does not support finer gradations. Council of Small Business Australia, *Australian Energy Regulator—Better Regulation program draft rate of return guideline—Comments*, 10 October 2013, pp. 3–4.

- It would provide greater certainty to investors about the outcome of the regulatory process.

In general, these considerations were supported by investors. For example, RARE Infrastructure stated the following:¹⁵⁵

A more stable return on equity would enhance clarity for all investors, and boost the desirability of Australian network businesses in the global investment universe (leading to lower cost of capital, which is in consumer interests).

Submissions in response to our draft guideline were also broadly supportive of stability. For example, the submission from the NSW DNSPs implied that a benefit of their proposed implementation of the Sharpe–Lintner CAPM is that it would provide stability in regulated returns on equity over time.¹⁵⁶

Given network assets are long-lived and typically generate stable cash flows, some stability in the return on equity may be expected. That is, it may be reasonable to expect that, on average, the difference between contemporaneous and long-term estimates of the return on equity should be relatively small. The theoretical and empirical evidence, however, suggests the return on equity is not stable over time.¹⁵⁷

We consider our approach appropriately balances the theoretical and empirical evidence with the characteristics of regulated infrastructure. For example, our implementation of the Sharpe–Lintner CAPM will result in estimates of the return on equity that may vary over time. Alternatively, the DGM and the Wright approach (for implementing the Sharpe–Lintner CAPM) will result in estimates of the return on equity that may be relatively stable over time. The informative use of these implementations of the Sharpe–Lintner CAPM, in addition to the DGM and other information, is expected to lead to more stable estimates of the return on equity than under our previous approach. The extent of this stability will depend on:

- the extent to which movements in the estimates of the risk free rate and market risk premium in the foundation model offset each other
- the informative value provided by the DGM and Wright approach (and other information that provides relatively stable estimates of the return on equity).¹⁵⁸

That required returns on equity are more stable over time than those generated using our previous approach is supported by the ENA and regulated infrastructure investors.¹⁵⁹ That said, consumer groups were more circumspect. Consumers supported more stable returns and consequently more stable prices, but not at any cost.¹⁶⁰ Specifically, consumers did not support more stable (long term) prices where these prices do not reflect efficient financing costs.¹⁶¹ For the reasons discussed within section 5.3.1, however, we consider that our approach will lead to estimates of the return on equity that reflect efficient financing costs.

¹⁵⁵ RARE Infrastructure Limited, *Submission to AER's rate of return guidelines consultation paper*, 14 June 2013. Also, see: The Financial Investor Group, *Response to the AER's rate of return guidelines consultation paper*, 24 June 2013.

¹⁵⁶ NSW DNSPs, *Submission on the draft guideline*, October 2013, p. 1.

¹⁵⁷ See, for example: AER, *Access arrangement final decision Envestra Ltd 2013-17, part 3: appendices*, March 2013, pp. 30–31.

¹⁵⁸ For example, takeover and valuation reports, and broker return on equity estimates may also be relatively stable.

¹⁵⁹ See, for example: Spark Infrastructure, *Response to the draft guideline*, October 2013, p. 5; ENA, *Response to the consultation paper*, June 2013, p. 46.

¹⁶⁰ See, for example: COSBOA, *Comments– draft guideline*, October 2013, p. 4; Public Advocacy Centre Ltd, *Submission to the AER's rate of return guidelines consultation paper*, 21 June 2013, p. 9.

¹⁶¹ Major Energy Users, *Response to the AER's rate of return guidelines consultation paper*, June 2013, p. 8.

5.3.8 Development process and stakeholder engagement

We consider the process that has led to the development of our proposed approach for estimating the expected return on equity has been thorough, logical and transparent.¹⁶² In particular, our process has received support from a range of stakeholders. For example, Spark Infrastructure stated the following:¹⁶³

We commend the AER for the transparency of the various review processes and for its demonstrated willingness to engage on the various arguments which have been put forward by network service providers and financial investors such as ourselves. We also believe the thoroughness of the process has been appreciated by the investment community as a whole.

Similarly, consumer groups commended our efforts to engage all stakeholders through the development of the Better Regulation program.¹⁶⁴

Alternatively, service providers have criticised our process for a number of reasons. For example, the ENA was critical of the development of our assessment criteria—specifically, they stated that the criteria are not found in the primary legislation or the regulatory rules.¹⁶⁵ The ENA also stated that our classification of relevant material (such as using material as the foundation model, or to inform the foundation model) was inconsistent with the rules, and that we excluded relevant material prematurely.¹⁶⁶ For the following reasons, we consider this criticism of the development of our foundation model approach is unfounded:

- We consider the relevant legislation supports the development of criteria to guide our exercise of regulatory judgement (including the assessment of relevant material). Notably, we have stated that these criteria do not supplant the rules, and nor do we consider they restrict the application of the rules.¹⁶⁷ Moreover, the AEMC considered that rate of return decisions should be principles based.¹⁶⁸
- Similarly, we consider using relevant material as the foundation model, to inform the foundation model input parameters, or to inform the final return on equity estimate is consistent with the broad rules framework. The rules do not stipulate that relevant material must be given equal regard in estimating the return on equity. Indeed, the AEMC was explicit that it is our role to determine what ‘weight’ to give to the different methods and information in estimating the return on equity.¹⁶⁹
- In developing our approach for estimating the return on equity we had regard to a range of alternative approaches. This included the concurrent consideration of the merits of these alternatives, as well as the merits of the relevant material to be used in these alternative approaches. That is, we did not form conclusions to exclude certain models from consideration before assessing their potential worth in practice. Instead, our use of a foundation model approach had regard to the merits of the relevant material.

¹⁶² This process was outlined in section 5.1.

¹⁶³ Spark Infrastructure, *Response to the draft guideline*, October 2013, p. 1.

¹⁶⁴ See, for example: PIAC, *Submission to the draft guideline*, October 2013, p. 3.

¹⁶⁵ See, for example: ENA, *Response to the draft guideline*, October 2013, pp. 11–13.

¹⁶⁶ See, for example: ENA, *Response to the draft guideline*, October 2013, pp. 11–13.

¹⁶⁷ AER, *Better Regulation: Explanatory statement, Draft rate of return guideline*, 30 August 2013, p. 27.

¹⁶⁸ AEMC, *Final rule determination*, 29 November 2012, pp. iv, 38, 42–44, 56–57.

¹⁶⁹ AEMC, *Rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012: National gas amendment (Price and revenue regulation of gas services) Rule 2012*, 29 November 2012, p. 67.

5.3.9 Consumer group submissions

Consumer group submissions broadly supported our foundation model approach, including the use of the Sharpe–Lintner CAPM as our foundation model.¹⁷⁰ For example, the MEU stated that our approach is sound, utilises available information in the most effective manner and provides a transparent method for developing an outcome.¹⁷¹ Similarly, PIAC submitted the following:¹⁷²

PIAC agrees with the importance of establishing a set of evaluation criteria and a clear framework for decision-making. In particular, PIAC is pleased that in establishing this framework, the AER has not adopted the ‘multi-model’ approach that has been suggested by some in response to the AEMC’s rule changes. PIAC has previously argued strongly that this type of approach would open the door for gaming and disputes between the NSPs and the AER, leaving consumers marginalised in the process. The current ‘multi-model’ approach that has been proposed by the ENA provides a real example of how the process of allowing NSPs to combine models in various ways can add complexity, minimise transparency and lead to unacceptable outcomes for consumers ...

PIAC also agrees with the use of the Sharpe–Lintner CAPM as the foundation model.

The EUAA also stated that preference should be given to approaches that are tractable and transparent, and for this reason, they supported our continued use of the Sharpe–Lintner CAPM.¹⁷³

Consumer group submissions are further discussed throughout the appendices related to estimating the expected return on equity.

5.3.10 Alternative approaches proposed by stakeholders

Section 5.3.1 outlined four broad approaches to estimating the return on equity that were considered during the development of our guideline. The ENA and APIA proposed a multiple model approach consistent with the fourth alternative. For example, the ENA described their approach as containing four key steps. These steps are:

- (1) Identify the models, methods, data and evidence to use.
- (2) Compute the best estimate of the required return for an average firm.
- (3) Compute the best estimate of the required return for a benchmark efficient entity using each approach and piece of evidence.
- (4) Distil a final estimate of the required return on equity.

The ENA initially proposed that step four would be implemented by applying quantitative weights to alternative models.¹⁷⁴ The ENA, however, have since stated that its multiple model approach could be implemented in a variety of forms. This includes ‘looser’ approaches that provide us with discretion to set out the reasons for alternative qualitative assessments.¹⁷⁵

¹⁷⁰ See, for example: COSBOA, *Comments – draft guideline*, October 2013; Ethnic Communities’ Council of NSW, *Submission to Better Regulation: Draft rate of return guidelines*, 10 October 2013.

¹⁷¹ MEU, *Comments on the draft guideline*, October 2013, p. 25.

¹⁷² PIAC, *Submission to the draft guideline*, October 2013, p. 29.

¹⁷³ EUAA, *Submission to the draft guideline*, October 2013, p. 2.

¹⁷⁴ ENA, *Response to the consultation paper*, June 2013, pp. 47–76.

¹⁷⁵ ENA, *Response to the draft guideline*, October 2013, p. 2.

Conceptually, the multiple model approach proposed by the APIA is similar. A notable difference is that the APIA proposed to make greater use of confidence intervals (in particular, the overlap of these intervals) to guide the selection of the final point estimate of the expected return on equity.¹⁷⁶

This section discusses multiple model alternatives in greater detail. In summary, we consider the ENA's and APIA's multiple model approaches have the following limitations:

- The regard given to relevant material in the proposed approaches is not supported by the merits of the material.
- The increased complexity of the proposed approaches is not justified. This applies to the estimation of the component models, as well as the process for combining estimates from multiple models into a single point estimate of the expected return on equity.
- The proposed approaches limit the ability for stakeholders to make reasonable estimates of the returns expected to be determined (in advance of a determination).
- The volume and nature of the relevant material required to be considered limits the transparency of these proposed approaches.

Use of relevant material

A key consideration in the ENA's and APIA's approaches is the concept that the required return on equity for the average firm should first be determined.¹⁷⁷ This return, which is equivalent to the return on the market portfolio, is then used to populate the alternative return on equity models. In the example submitted by the ENA, DGM estimates were used to inform the estimation of the return on the market, the Sharpe–Lintner CAPM, the Black CAPM and the Fama–French three factor model. Moreover, the ENA used DGM estimates to inform its overall estimation of the expected return on equity.

We consider that this approach may not be consistent with the implementation of an approach in accordance with good practice. For example, for the following reasons we consider this approach may lead to regard being given to relevant material beyond which the merits of that material support:

- Under the ENA's approach, the return on the market is determined solely from DGM estimates. The limitations of DGMs are discussed in appendices A and E. Given these limitations, and that the corresponding estimate of the return on the market is promulgated through each of the alternative models, this may give too much regard to DGM estimates.
- The ENA's and APIA's approaches place substantial weight on the Fama–French three factor model. As discussed in appendix A, we consider that this model may not meet most of our assessment criteria.
- The ENA's and APIA's approaches placed substantial weight on the Black CAPM. As discussed in appendix A, we consider that this model may not meet most of our assessment criteria.

Level of complexity

The ENA described its multiple model approach as lining up all the relevant evidence, discussing the reliability and precision of each piece of evidence, and giving more reliable and precise evidence

¹⁷⁶ See, for example: APIA, *Submission to the draft guideline*, October 2013, pp. 22–23.

¹⁷⁷ ENA, *Response to the consultation paper*, June 2013, p. 47; APIA, *Submission on the consultation paper*, June 2013, p. 32.

relatively more weight.¹⁷⁸ Similarly, the APIA refers to its approach as 'very simple'.¹⁷⁹ In contrast, the foundation model approach is described as highly complex and not at all transparent.¹⁸⁰

For the following reasons, we disagree with the ENA's and APIA's characterisation of both ours and their proposed approaches:

- The approach proposed by the ENA requires the full parameterisation of the Sharpe–Lintner CAPM, Black CAPM, Fama–French three factor model and multiple DGMs.¹⁸¹ The APIA also proposed to estimate the return on equity using Arbitrage Pricing Theory.¹⁸² In contrast, our foundation model approach only requires the full parameterisation of the Sharpe–Lintner CAPM and DGM.
- The estimation of the input parameters required to implement the Sharpe–Lintner CAPM is a complex and resource intensive task. For example, the estimation of the equity beta requires complex econometric analysis to determine a range of reasonable estimates. Regulatory judgement must then be used to determine a point estimate. Similarly, to determine a point estimate of the MRP from a range of evidence requires regulatory judgement. The Fama–French three factor model, however, requires the estimation of an additional two beta estimates, and an additional two risk premiums.
- The DGM proposed by the ENA is very complex. As discussed in appendix E, it estimates the expected return on equity by considering 2,672 possible combinations of input assumptions. An algorithm is then used to select one outcome from these 2,672 combinations. In contrast, the DGMs we have proposed adopt a more common approach, in which the long term dividend growth rate is an input to the model.
- The APIA proposed to use the overlap of statistical confidence intervals from multiple models to determine the expected return on equity. Determining the overlap of these intervals may be 'very simple', as stated by the APIA, but the econometric analysis required to develop these intervals would likely be complex.¹⁸³

Importantly, it is not clear how the full parameterisation of multiple models is in the long-term interests of consumers. For example, for the following reasons we consider the additional complexity in the ENA's and APIA's proposed approaches is not consistent with our fitness for purpose criterion:

- The full parameterisation of multiple models, including the greater use of complex econometric models, increases the arcane nature of the cost of capital debate. Given that the level of precision for which equity returns can be estimated is limited (see section 5.3.6), we consider such complexity may not be justified.
- The volume of material submitted by the ENA and APIA in support of their multiple model approaches certainly adds to the discourse on the return on equity. Nevertheless, it does not decide it. It is well recognised in the academic literature, as well as in reports submitted by service providers, that the available evidence that can be used to estimate the expected return on equity is imprecise and subject to varied interpretations.¹⁸⁴ In particular, there is often no consensus

¹⁷⁸ ENA, *Response to the draft guideline*, October 2013, p. 10.

¹⁷⁹ APIA, *Submission to the draft guideline*, October 2013, p. 22.

¹⁸⁰ ENA, *Response to the draft guideline*, October 2013, p. 10.

¹⁸¹ ENA, *Response to the draft guideline*, October 2013, pp. 21–23.

¹⁸² APIA, *Submission to the draft guideline*, October 2013, p. 22.

¹⁸³ APIA, *Submission to the draft guideline*, October 2013, p. 22.

¹⁸⁴ In regard to the MRP, for example, see academic papers by: R. Mehra and E. C. Prescott, *The equity premium, A puzzle*, Journal of Monetary Economics, 15, 1985, pp. 145–161; A. Damodaran, *Equity Risk Premiums (ERP), Determinants*,

among experts on either the appropriate method or the assumptions for different methods to be used in estimating the return on equity. Moreover, each of the methods have strengths and limitations. In this context, we consider that the rationale for increasing the arcane nature of the cost of capital debate may not be justified.

- It is not clear how the statistical confidence intervals in the APIA's proposal could actually be determined (irrespective of stakeholders' econometric expertise). For example, the estimation of input parameter estimates—such as the equity beta and MRP—typically draw on a range of information (both quantitative and qualitative in nature). Notably, qualitative information may be less amenable to the robust formation of confidence intervals.

Level of predictability

As noted in our consultation paper, and in stakeholder submissions, the guideline should provide certainty and predictability to assist investors in making their investment decisions.¹⁸⁵ The APIA proposed using the overlap of confidence intervals from multiple models to facilitate this predictability. The ENA initially proposed the application of quantitative weights to achieve predictability, but is now also open to qualitative assessments of alternative models.

For the following reasons, we consider it may be difficult for stakeholders to make reasonable estimates of the returns expected to be determined (in advance of a determination) under each of these approaches:

- The ability of stakeholders to examine ranges of overlap, and therefore make reasonable estimates of expected returns, is predicated on the assumption that stakeholders can readily determine the corresponding statistical ranges. As the APIA acknowledged, however, not every stakeholder can undertake econometric analysis.¹⁸⁶
- If qualitative assessments of alternative models are used in the ENA's multiple model approach, it may be difficult for stakeholders to make reasonable estimates of the returns expected to be determined (in advance of a determination). That is, even if stakeholders could determine estimates from the Sharpe–Lintner CAPM, Black CAPM, Fama–French three factor model and DGMs, they would have little guidance regarding how to combine the different estimates from these models.
- More generally, the complexity of the ENA's and APIA's proposed approach may make it difficult for stakeholders to make reasonable estimates of the returns expected to be determined in advance of a determination. For example, it may be difficult for stakeholders to form a view on the impact of prevailing market conditions on the factor exposure and premiums required to implement the Fama–French three factor model. Further, it may be difficult for stakeholders to form a view on the likely impact of prevailing market conditions on the informative value of alternative models.¹⁸⁷

Estimation and Implications, September 2008, p. 1; J. S. Doran, E. I. Ronn and R. S. Goldberg, *A simple model for time-varying expected returns on the S&P 500 Index*, August 2005, pp. 2–3. For an example report from regulated entities, see: Officer and Bishop, *Market risk premium, a review paper*, August 2008, pp. 3–4.

¹⁸⁵ FIG, *Response to the consultation paper*, June 2013, p. 1.

¹⁸⁶ APIA, *Submission to the draft guideline*, October 2013, p. 24.

¹⁸⁷ There is a high degree of imprecision already inherent in the available return on equity models. Given this imprecision, it is not feasible to take the additional step of determining which model may perform best in particular circumstances.

Level of transparency

We consider the allowed rate of return objective may be achieved if the proposed method for estimating the expected return on equity is implemented in accordance with good practice. In particular, this includes that the proposed method is supported by robust, transparent and replicable analysis. The reasons supporting this criterion are outlined in greater detail in chapter 2.

For the following reasons, we consider the volume and nature of the relevant material required to be considered limits the transparency of the multiple model approaches proposed by the ENA and APIA:

- The greater use of complex econometric models increases the potential for strategic behaviour. The Fama–French three factor model and the ENA's preferred DGM, for example, are both very complex. The merits of these models are discussed in detail in appendices A and E. This complexity limits the ability to understand the variables driving the models outputs, and to assess the reasonableness of these outputs. In contrast, the Sharpe–Lintner CAPM and more simplistic DGMs are intuitive, and are amenable to robust and coherent analysis.¹⁸⁸
- The ENA proposed that its multiple model approach may be implemented by applying quantitative weights to alternative models. We consider that quantitative weights imply a level of precision inappropriate for this task. For example, under the ENA's approach, some models may be assigned one third weight, whereas others may be assigned one sixth weight. It is not clear, however, whether assigning double the weight to one model indicates that it is twice as good. Similarly, it is unclear what reasons would justify one third weight relative to a slightly different weights—for example, why not one quarter, or one half weight?
- The ENA stated that their multiple model approach is transparent, as all the relevant material can be lined up and simply assigned value dependent on the merits of the relevant material.¹⁸⁹ We consider this overstates any inherent transparency. For example, the ENA proposed to determine estimates from four alternative models. If a qualitative assessment of this material is undertaken, however, it would be difficult to discern the relative value given to a particular estimate. For example, a final estimate that gives equal regard to four alternative models may produce an identical outcome to a final estimate that gives primary regard to three models, and lesser regard to one model.

For clarity, we recognise the final two dot points above may also apply to our foundation model approach.¹⁹⁰ Indeed, similar criticisms were submitted by the ENA.¹⁹¹ As discussed in section 5.3.1, however, the fundamental point is that all approaches have strengths and limitations. It is our role, therefore, to determine what 'weight' to give to different methods and information in estimating the expected return on equity.¹⁹²

¹⁸⁸ See, for example: S. Myers, *Estimating the cost of equity: Introduction and overview*, 17 February 2013; APA Group, *Submission on the draft guideline*, October 2013, p. 22.

¹⁸⁹ ENA, *Response to the draft guideline*, October 2013, p. 10.

¹⁹⁰ For example, as outlined in section 5.3.4, there may be a limit to the reasoning we can provide to justify our MRP estimate over another similar value. Likewise, if our final estimate of the expected return on equity differs from our foundation model estimate, it may be difficult to discern the qualitative value of other relevant information.

¹⁹¹ ENA, *Response to the draft guideline*, October 2013, pp. 16–18.

¹⁹² AEMC, *Rule determination: National electricity amendment (Economic regulation of network service providers) Rule 2012: National gas amendment (Price and revenue regulation of gas services) Rule 2012*, 29 November 2012, p. 67.