Attachment 10.26

Response to Draft Decision: Rate of Return

2016/17 to 2020/21 Access Arrangement Information Response to Draft Decision

Australian Gas Networks

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1 Response to Draft Decision on Rate of Return

1.1 Introduction

This attachment sets out Australian Gas Networks Limited's (AGN's) response to the Australian Energy Regulator's (AER's) Draft Decision on the rate of return over the next (2016/17 to 2020/21) Access Arrangement (AA) period.

1.2 AER Draft Decision

In its Initial AA Proposal, AGN proposed a rate of return of 7.23% (indicative for 2016/17) calculated as follows:

- As to the return on equity, calculated as the weighted average of estimates from four relevant models, namely the Sharpe-Lintner CAPM (weighted as to 12.5%), the Black CAPM (weighted as to 25.0%), the Fama-French model (weighted as to 37.5%) and the dividend discount model (weighted as to 25.0%) using parameter inputs as follows:
  - a placeholder estimate of the risk free rate of 2.55% measured as the average of 10 year CGS yields over the 20 business day averaging period ending on 6 March 2015;
  - a value for equity beta of 0.82; and
  - a value for the market risk premium (MRP) of 8.23%.
- As to the return on debt:
  - adopting a 10-year term and BBB+ credit rating;
  - based on a transition from the current 'on-the-day' approach to a trailing average approach;
  - application of a 10-year transition to the base interest rate only (assuming 100% of the base rate is hedged), with no transition applied to the debt risk premium (DRP) (i.e. a 'hybrid transition' approach);
  - using a placeholder estimate of the base interest rate of 2.52% measured as the average of one to ten-year swap rates over the 20 business day averaging period ending on 6 March 2015;
  - using the following data sources for the DRP:
    - for the 8 years ending 30 June 2014, the average of Bloomberg and Reserve Bank of Australia (RBA) estimates;
    - for subsequent years, testing be undertaken using the approach set out in the CEG report (June 2015)[1] to find the data source (or sources) that provides the best fit to the data;
  - using the following extrapolation methods (to make the data sources consistent with the 10-year benchmark debt term):
    - for the 8 years ending 30 June 2014, the AER extrapolation methodology;

[1] Attachment 10.22 to AGN's Initial AA Proposal. The approach involves calculating the sum of squared errors from observed bond data of difference in third-party yield estimates extrapolated to 10 years using AER and SA Power Networks extrapolation methodologies.

        - for subsequent years, testing be undertaken using the approach set out in the CEG report (June 2015) to find the extrapolation method that provides the best fit to the data;

    - with the base interest rate and DRP calculated over different averaging periods (i.e. a longer averaging period for the DRP and a shorter averaging period for the base rate);
    - including a new issue premium of 27 basis points;
    - including transaction costs of entering into and maintaining a swap strategy of 23 basis points;
    - including debt raising costs of 17.84 basis points.

- Calculating the overall rate of return:
    - by adopting a weighted average of the return on equity and return on debt determined on a nominal vanilla basis (as required by the National Gas Rules (NGR)); and
    - using a gearing ratio (leverage) of 60%.

As summarised in Table 1 below, in the Draft Decision, the AER:

- rejected AGN's proposed return on equity of 9.91% (indicative) in favour of its own estimate of 7.3% (indicative);
- rejected AGN's proposed return on debt of 5.44% (indicative for 2016/17) in favour of its own estimate of 5.16% (indicative for 2016/17); and
- rejected AGN's proposed overall rate of return of 7.23% (indicative for 2016/17) in favour of its own estimate of 6.02% (indicative for 2016/17).

TABLE 1: SUMMARY OF AER'S DRAFT DECISION ON RATE OF RETURN

	AER Draft Decision	AER Comment
Return on equity		
Multi-model approach to return on equity	Reject AGN proposal	The AER rejected AGN's proposed multi-model approach in favour of its "foundation model approach" of using just the Sharpe-Lintner CAPM to directly estimate the return on equity
Measurement of risk free rate	Modify AGN proposal	The AER accepted that 10 year CGS yields be used to estimate the risk free rate, but adopted an estimate of 2.76% based on a later placeholder averaging period than used in AGN's Initial AA Proposal
Estimate of equity beta	Reject AGN proposal	The AER rejected AGN's estimate of equity beta of 0.89 in favour of its own estimate of 0.7
Estimate of MRP	Reject AGN proposal	The AER rejected AGN's estimate of the MRP of 8.23% in favour of its own estimate of 6.5%
Overall proposal	Reject AGN proposal	The AER rejected AGN's proposed return on equity of 9.91% (indicative) in favour of its own estimate of 7.3% (indicative)
Return on debt		
Credit rating and debt term	Accept AGN proposal	The AER accepted AGN's proposed 10 year term and BBB+ credit rating for the return on debt
Transition to trailing average	Accept AGN proposal	The AER accepted AGN's proposal to transition from an on-the-day approach to a trailing average
Form of transition	Reject AGN proposal	The AER rejected AGN's proposed hybrid transition, in which a 10-year transition is applied only to the base rate, in favour of a 10-year transition applied to both the base rate and the DRP

	AER Draft Decision	AER Comment
Measurement of base interest rate	Modify AGN proposal	Under the AER's proposed methodology, the base interest rate is not required to be separately estimated
DRP data sources	Reject AGN proposal	The AER rejected AGN's proposed best fit testing for data sources in favour of a simple average of broad BBB rated debt data published by the RBA and Bloomberg
DRP extrapolation methods	Reject AGN proposal	The AER rejected AGN's proposed best fit testing for extrapolation methods in favour of its own extrapolation method
Averaging periods	Modify AGN proposal	The AER rejected AGN's proposal for separate averaging periods for the base rate and the DRP and accept AGN's proposed averaging period for the base rate in 2016/17, and AGN's proposed averaging period for the DRP in later years, for both the base rate and the DRP
New issue premium	Reject AGN proposal	The AER rejected AGN's proposal to include a new issue premium of 27 basis points in the return on debt calculation
Swap strategy transaction costs	Reject AGN proposal	The AER rejected AGN's proposal to include swap transaction costs of 23 basis points in the return on debt calculation
Debt raising costs	Modify AGN proposal	The AER rejected AGN's proposal to include debt raising costs of $8.5 million in favour of an allowance of $3.8 million
Overall proposal	Reject AGN proposal	The AER rejected AGN's proposed return on debt of 5.44% (indicative for 2016/17) in favour of its own estimate of 5.16% (indicative for 2016/17)
Rate of return (overall)		
Gearing ratio	Accept AGN proposal	The AER accepted AGN's proposed gearing ratio of 60%
Overall proposal	Reject AGN proposal	The AER rejected AGN's proposed overall rate of return of 7.23% (indicative for 2016/17) in favour of its own estimate of 6.02% (indicative for 2016/17)

As to the appropriate approach to calculating the return on debt, AGN noted in its Initial AA Proposal that:

- if the AER is correct in its view that there is only one single benchmark efficient debt management strategy, then the correct single benchmark would reflect a full trailing average approach without any transition, being the efficient approach that is in fact replicable by all firms, rather than the methodology replicable by only some firms; and

- AGN had, in its proposal, taken a conservative approach to the return on debt by proposing a hybrid transition based on an assumption of 100% hedging of the base rate.

AGN also raised for consideration an approach under which a hybrid transition would be implemented, using an optimal proportion of the base rate that would be hedged by a benchmark efficient entity with an immediate (that is, no) transition of the remaining proportion of the base rate.

In the light of the Draft Decision, AGN now raises and maintains in its Revised AA Proposal that:

(a) there be an immediate move from the on-the-day approach to the trailing average approach (that is, no transition);

(b) if the AER rejects the position in (a), there be a transitional hedging of the base rate only as to a proportion of the base rate, representing that proportion of the base rate which it is efficient to hedge (estimated by AGN as 33.3%), with no transition of the remaining proportion of the base rate, and with an immediate move from the on-the-day approach to determining the DRP to a trailing average approach for determining the DRP; and

(c) if the AER rejects the positions in (a) and (b), there be a transitional hedging of the base rate only as to 100%, with an immediate move from the on-the-day approach to determining the DRP to a trailing average approach for determining the DRP.

AGN contends that it is able to raise and maintain the three alternatives in the merit order set out above, and does so for the purposes of section 258A(3) of the National Gas Law (NGL).

If however, it is later held by the Australian Competition Tribunal or the Court that AGN is bound to elect which among the above alternatives it maintains for the purposes of section 258A(3) of the *National Gas Law*, AGN elects in this Revised AA Proposal to maintain that there be a transitional hedging of the base rate only as to a proportion of the base rate, representing that proportion of the base rate which it is efficient to hedge (estimated by AGN as 33.3%), with no transition of the remaining proportion of the base rate, and with an immediate move from the on-the-day approach to determining the DRP to a trailing average approach for determining the DRP.

1.3 AGN Response to the Draft Decision - Overview

AGN's Revised AA Proposal addresses the allowed rate of return (this Attachment 10.26), the value of imputation credits, or gamma, (Attachment 11.10) and the method for forecasting inflation (Attachments 9.2 and 9.3). The rate of return, the value of imputation credits (gamma) and the method for forecasting inflation each impact on the overall return to investors. Specifically:

- under the NGR the allowed rate of return is the post-tax return allowed to investors, calculated as a weighted average of the return on equity and return on debt;[2]

- gamma represents the value of imputation credits to investors associated with the payment of company tax. This value effectively forms part of the overall return to equity investors; and

- forecast inflation is used to adjust the cash flows to maintain a real rate of return framework.[3] It thus has an important interrelationship with the rate of return, and impacts on the overall return to investors—it is akin to capital gains earned on an investment. If inflation is not correctly forecasted, the adjustment to cashflows may be too large (or too small) and thus investors may receive an overall return that is too low (or too high).

In order to promote the National Gas Objective (NGO), the overall return to investors must be sufficient to promote efficient investment in, and efficient operation and use of, gas services for the long term interests of consumers. Critical to the promotion of efficient investment is that businesses be provided with a reasonable opportunity to recover efficient costs (i.e. the costs that would be incurred by an efficient business in a workably competitive market). This means that:

- the return on debt allowance must be such as to provide a reasonable opportunity to recover at least the efficient debt financing costs of a benchmark efficient entity (BEE) with a similar degree of risk as that which applies to AGN in respect of the provision of reference services;

- the return on equity allowance must reflect returns required by equity investors to invest in businesses facing a similar degree of risk;

- gamma must reflect the value that equity-holders place on imputation credits (not simply their face value or utilisation rate). If the value of imputation credits is over-estimated, the overall return to equity-holders will be less than what is required to promote efficient investment in, and efficient operation and use of, gas services for the long term interests of consumers; and

- the inflation forecast must reflect market expectations of inflation over the AA period.

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2 NGR 87(4).

3 While the PTRM is a nominal model in that it has nominal inputs including for the rate of return (as required by NGR 87(4)(b)), the PTRM is properly understood as embodying a real rate of return framework in that it derives a real revenue path for the AA period, expressed in terms of the real X factor for each regulatory year of the AA period, that includes compensation for a real rate of return (effectively derived by the PTRM by taking a nominal input for the cost of debt and equity and deducting forecast inflation).

The Draft Decision does not provide for an overall return that is consistent with the NGO. For reasons set out in this section:

- the allowed rate of return is not commensurate with the efficient financing costs of a BEE with a similar degree of risk as that which applies to AGN in respect of the provision of reference services;
- the value of imputation credits is over-estimated, meaning that the reduction to the overall return to account for imputation credits is too large; and
- the AER's forecast of inflation is also over-estimated, meaning that the reduction to the overall return to account for expected indexation of the capital base is too large and otherwise does not reflect current market expectations.

This Attachment 10.26 explains AGN's specific concerns with the Draft Decision in relation to the rate of return. Attachment 11.10 explains AGN's concerns with the value of imputation credits while Attachments 9.2 and 9.3 deal with forecast inflation. This Attachment 10.26 also deals with the interrelationships between each of these topics.

As explained below, in some areas (such as the benchmark gearing level and term of debt) AGN agrees with the AER's position in the Draft Decision. To the extent that the AER proposes to change its position in any of these areas in its Final Decision, AGN would need to be informed of that and provided with a reasonable opportunity to respond to any proposed change of approach.

1.3.1 Achieving the allowed rate of return objective

The allowed rate of return objective (ARORO) is the touchstone for estimating the allowed rate of return. The NGR require that:

- the return on equity for an AA period be estimated such that it contributes to the achievement of the ARORO;[4] and
- the return on debt for a regulatory year be estimated such that it contributes to the achievement of the ARORO.[5]

The ARORO is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a BEE with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.[6]

As can be seen, the ARORO has two key elements:

- first, the ARORO requires identification of the level of risk that applies to the service provider in respect of the provision of reference services; and
- secondly, the ARORO requires estimation of efficient financing costs for a BEE facing a similar degree of risk.

AGN considers that the relevant level of risk is that faced by entities operating in a workably competitive market providing services similar to reference services within Australia. Therefore, in constructing comparator datasets for the purposes of estimating a rate of return that is commensurate with efficient financing costs of a BEE, these datasets should include entities that face a similar degree of risk to that faced in the provision of reference services. That is, they should not be restricted to regulated entities.

If AGN is incorrect that the relevant level of risk is that faced by entities operating in a workably competitive market providing services similar to reference services within Australia, but rather, the relevant level of risk

4 NER 87(6).
5 NER 87(8).
6 NER 87(3).

is that of a regulated energy network business, AGN submits that the reference to 'efficient financing costs' in the ARORO is to costs incurred (and therefore financing practices adopted) in a workably competitive market to finance an investment with that risk profile.

That is, regardless of what the relevant degree of risk is, once this risk benchmark is established, the assessment of efficient financing costs requires consideration of what financing practices would be engaged in by businesses operating in a workably competitive market, facing the relevant degree of risk. Such an interpretation of the term 'efficient financing costs' in the ARORO is consistent with the object of regulation itself, which is to simulate competitive market outcomes. This is because it is ultimately competition that drives efficient behaviour and is the benchmark that the NGL seeks to replicate. The 'workably competitive market' concept is described in more detail in section 1.4.2 below.

Many of the issues dealt with in this Attachment are the subject of applications for merits review of the AER's distribution determinations for the NSW electricity distributors (Ausgrid, Endeavour Energy, Essential Energy), the ACT electricity distributor (ActewAGL) and the NSW gas distributor (JGN) (NSW and ACT merits reviews). These issues include the approach taken by the AER to estimating the return on equity and the methodology to estimate the return on debt. The applications were heard in September and October 2015. Once the decisions of the Tribunal have been published, AGN will review the decisions and consider the implications, if any, of those decisions for the Final Decision the AER is required to make for AGN. To the extent AGN considers that the decisions do have implications for the Final Decision, AGN will make any submissions to the AER on those implications as soon as practicable after the Tribunal's decisions have been published and considered by AGN.

1.3.2 Return on debt

As became clear from the detailed consideration of the return on debt issue in the NSW and ACT merits review processes, the method that the AER proposes to adopt in its Draft Decision for estimating the return on debt will not deliver a return on debt estimate which contributes to the achievement of the ARORO and the NGO. The ARORO is concerned with the financing costs and practices that are efficient in the economic sense, that is, the financing costs incurred, and practices adopted, in a workably competitive market.

As set out below, AGN submits that the debt management practice that would be expected absent regulation is the holding of a staggered portfolio of fixed rate debt, the cost of which can be estimated by the trailing average approach. Given the intent of regulation is to replicate, insofar as possible, the outcomes that would be expected in workably competitive markets, the efficient financing costs to be estimated pursuant to NGR 87 are required to be estimated using the trailing average approach and this approach should be adopted without any transition (AER Option 4).

The AER's approach to transitioning to the trailing average estimation method will lead to a return on debt allowance for the 2016/17 to 2020/21 AA period that is below the efficient financing costs of a BEE for that period. This is because:

- The AER's approach proceeds on the incorrect premise that the efficient financing costs of a BEE are those that would be incurred under the financing practices that would have emerged under the previous regulatory approach to estimating the return on debt. The correct approach is to identify the efficient financing costs of a BEE, which are the costs that would be incurred in a workably competitive market (or, put another way, the costs that would be incurred absent regulation).

- The AER considered that the trailing average approach may be more reflective of the actual debt management approaches of non-regulated businesses and, therefore, more likely to represent efficient financing practice.[7] The AER found that the efficient financing practice under the trailing average approach is to hold a staggered portfolio of fixed rate debt.[8] The efficient financing costs of a BEE are thus the costs associated with a staggered portfolio of fixed rate debt.

[7] AER, *Rate of Return Guideline: Explanatory Statement*, December 2013, pp 108–111.
[8] AER, *Rate of Return Guideline: Explanatory Statement*, December 2013, pp 108–110.

- Expert advice from CEG confirms that a 10-year trailing average approach would largely mimic the debt management strategy employed by unregulated infrastructure businesses.[9]

- Given that the costs associated with a staggered portfolio of fixed rate debt are best approximated by a trailing average methodology, the immediate implementation of the trailing average approach to estimating the return on debt will provide an allowance that reflects efficient financing costs. Conversely, application of a transition that results in the return on debt being different from efficient financing costs will, by definition, lead to an allowance that is not commensurate with the efficient debt financing costs of a BEE.

For these reasons, AGN considers that the trailing average approach should be implemented immediately, with no transition.

Alternatively, even if the AER's approach of estimating efficient financing costs by reference to the financing practices that would emerge under regulation were correct, the appropriate approach would be to adopt a hybrid form of transition where only the hedged base rate component of the return on debt is subject to a transition (AER Option 3). This is because the AER has concluded that under the previous on-the-day approach to estimating the return on debt, an efficient financing practice would have been to engage in hedging of the base rate. By contrast, the AER has conceded that the debt risk premium (DRP) component of the return on debt cannot be (and could not have been) hedged, with the result that there is no reason for a transition to be applied to it.

If the hybrid transition is to be adopted, it would then be necessary to consider to what degree of hedging would have been efficient. While the AER's reasoning assumes that the efficient level of hedging was 100%, this is incorrect as a matter of fact and the evidence demonstrates that the efficient level of hedging of the base rate under an on-the-day approach to estimating the return on debt is significantly less than 100%.

On any view of what are efficient financing costs, the AER's transition cannot be justified. Even on the AER's view of the correct approach to estimating efficient financing costs, and assuming that the BEE hedged 100% of the base rate, application of the AER's transition would lead to a mismatch between efficient financing costs and the regulatory allowance on the DRP component as the DRP could not have been hedged by a BEE.

In respect of implementation issues, AGN submits that the AER should:

- adopt a benchmark credit rating of BBB+, as in the Draft Decision;

- continue to adopt a benchmark term of ten years;

- calculate the cost of debt by reference to separate averaging periods for the base rate and the DRP, such that the cost of debt for each regulatory year is calculated as the sum of:

  – the base rate measured by reference to swap rates in the relevant base rate averaging period as nominated by AGN[10] – below, the base rate averaging period for the n^{th} year of the transition is referred to as BRAP*n*; and

[9] CEG, *Efficiency of Staggered Debt Issuance*, February 2013, [92], [97], [101] and [102] (http://www.aer.gov.au/system/files/Ausgrid%20-%207.03%20-%20CEG%20-%20Efficiency%20of%20staggered%20debt%20issuance%20-%20Feb%202013.pdf). This report, and others referenced in this Revised AA Proposal that were not submitted with AGN's Initial AA Proposal, are formally submitted as part of the Revised AA Proposal. AGN wishes the AER to consider them as part of the Revised AA Proposal. The AER already has copies of these reports (web addresses to the AER's website are provided) and for this reason AGN is not providing further copies with the Revised AA Proposal. However, if the AER wishes copies of the reports, AGN will provide them promptly.

[10] AGN's nominated averaging periods for the "hybrid transition" approaches are as set out in Confidential Attachment 10.2 provided with AGN's Initial AA Proposal. Confidential Attachment 10.2A to this Revised AA Proposal sets out AGN's nominated averaging period for the "no transition" approach.

  - the DRP measured relative to 10-year swap rates in the relevant DRP averaging period as nominated by AGN[11] – below, the base rate averaging period(s) for the *n*th year of the transition is referred to as DRPAP*n*); and

  - (in the case of the hybrid transition approach), swap transaction costs;

- calculate the DRP:

  - in respect of the eight years ending 30 June 2014, as the average of Bloomberg and RBA estimates extrapolated to ten years using the AER methodology (as set out in Table 8 of CEG's latest report[12]);

  - in respect of subsequent years, by undertaking testing using the approach set out in Section 5 of, and Appendix A to, the June 2015 CEG report[13] (calculating the sum of squared errors from observed bond data of difference in third-party yield estimates extrapolated to ten years using AER and SA Power Networks extrapolation methodologies) and selecting the data source (or sources) and extrapolation method (or methods) that provide the best fit to the data for the relevant regulatory year;[14] and

- include a new issue premium of 27 basis points in the estimate of the return on debt for each regulatory year.

Under the "no transition" approach, the return on debt would be calculated for each regulatory year of the AA period as follows:

- the base rate is calculated and updated annually as follows:

  - in the first year of the transition (2016/17), the average of the 10-year swap rates for the ten years ending 2015/16 measured over BRAP1;

  - in the second year of the transition (2017/18), 90% weight given to the average of the 10-year swap rates for the nine years ending 2015/16 (measured over DRPAP1) and 10% weight given to the average of the 10-year swap rates in BRAP2;

  - in third year of the transition (2018/19), 80% weight given to the average of the 10-year swap rate for the eight years ending 2015/16 (measured over DRPAP1), 10% weight given to the average of the 10-year swap rates in BRAP2 and 10% weight given to the average of the 10-year swap rates in BRAP3;

  - and so on for years four to nine, updating the weightings accordingly and adding the average of the 10-year swap rates in the base rate averaging period for the relevant regulatory year; and

  - in the tenth year of the transition (2025/26), 10% weight given to each of the averages of the 10-year swap rates in each of BRAP1 to BRAP10; and

- the DRP is calculated and updated annually as follows:

  - in the first year of the transition (2016/17), the historical average DRP for the ten years ending 2015/16 measured over DRPAP1;

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11 AGN's nominated averaging periods for the "hybrid transition" approaches are as set out in Confidential Attachment 10.2 provided with AGN's Initial AA Proposal. Confidential Attachment 10.2A to this Revised AA Proposal sets out AGN's nominated averaging period for the "no transition" approach.

12 CEG, *Curve testing and selecting averaging periods*, January 2016 (Attachment 10.27 to this Revised AA Proposal).

13 CEG, *The hybrid method for the transition to the trailing average rate of return on debt*, June 2015 (Attachment 10.22 to AGN's Initial AA Proposal).

14 The results of this testing for 2014/15 are set out in CEG, *Curve testing and selecting averaging periods*, January 2016, section 2.3 (Attachment 10.27 to this Revised AA Proposal).

  - in the second year of the transition (2017/18), 90% weight given to the historical average DRP for the nine years ending 2015/16 (measured over DRPAP1) and 10% weight given to the average DRP over DRPAP2;

  - in third year of the transition (2018/19), 80% weight given to the historical average DRP for the eight years ending 2015/16 (measured over DRPAP1), 10% weight given to the average DRP over DRPAP2 and 10% weight given to the average DRP over DRPAP3;

  - and so on for years four to nine, updating the weightings accordingly and adding the average DRP over the DRP averaging period for the relevant regulatory year; and

  - in the tenth year of the transition (2025/26), the ten year average DRP over DRP10.

Under a "hybrid transition" approach, assuming hedging of 33.3% of the base rate, the return on debt for each regulatory year would be calculated as follows:

- the base rate is a weighted average of the base rate as determined under the "no transition" approach as set out above (weighted as to 66.7%) and as determined under the "hybrid transition" approach as set out below (weighted as to 33.3%); and

- the DRP is calculated and updated annually in the same manner as under the "no transition" approach (as set out above); and

- swap transaction costs of 3.83 basis points are added each year with a weighting of:

  - 100% in the first year of the transition (2016/17) (i.e. 0.038%);

  - 90% in the second year of the transition (2017/18) (i.e. 0.034%);

  - 80% in the third year of the transition (2018/19) (i.e. 0.031%);

  - and so on for years four to nine; and

  - 10% in the tenth year of the transition (2025/26) (i.e. 0.004%).

Under a "hybrid transition" approach, assuming hedging of 100% of the base rate, the return on debt would be calculated as follows:

- the base rate is calculated and updated annually as follows:

  - in the first year of the transition (2016/17), the average of one-to-10 year swap rates in BRAP1; and

  - in the second year of the transition (2017/18), 90% weight given to the average of two-to-10 year swap rates in BRAP1, and 10% weight given to the average of the 10-year swap rates in BRAP2;

  - in the third year of the transition (2018/19), 80% weight given to the average of three-to-10 year swap rates in the BRAP1, 10% weight given to the average of the 10-year swap rates in BRAP2 and 10% weight given to the average of the 10-year swap rates in BRAP3;

  - and so on for years four to nine, updating the weightings accordingly and adding the relevant average 10-year swap rate measured over the base rate averaging period for the relevant regulatory year; and

  - in the tenth year of the transition (2025/26), 10% weight given to each of the averages of the 10-year swap rates in each of BRAP1 to BRAP10;

- the DRP is calculated and updated annually in the same manner as under the "no transition" approach (as set out above); and
- swap transaction costs of 11.5 basis points are added each year with a weighting of:
  - 100% in the first year of the transition (2016/17) (i.e. 0.115%);
  - 90% in the second year of the transition (2017/18) (i.e. 0.104%);
  - 80% in the third year of the transition (2018/19) (i.e. 0.092%);
  - and so on for years four to nine; and
  - 10% in the tenth year of the transition (2025/26) (i.e. 0.012%).

AGN refers to and repeats its position regarding the three approaches referred to above, as set out at the end of section 1.2 above.

1.3.3 Return on equity

The method adopted by the AER in its Draft Decision does not result in a return on equity that is consistent with the ARORO.

The evidence before the AER is that its estimate is too low. In particular:

- the AER's estimate fails a number of its own cross-checks; and
- it is below all available and relevant evidence as to the return on equity required by investors.

This outcome is the result of:

- the AER relying solely on the output of a model that is known to produce biased estimates, without the AER correcting for this bias;
- the AER applying this model in a way that does not reflect market practice and which results in the return on equity simply tracking movements in the risk-free rate; and
- errors in interpretation and use of key evidence, including empirical evidence relating to the estimation of the market risk premium (MRP) and equity beta.

AGN continues to believe that the ARORO is best achieved through an approach that properly has regard to estimates from all relevant return on equity models. In its initial proposal, AGN proposed that each of the Sharpe-Lintner Capital Asset Pricing Model (SL CAPM), the Black CAPM, the Fama French Three Factor Model (FFM) and Dividend Growth Model (DGM) be estimated, and that these estimates each be given appropriate weight in deriving a return on equity estimate. AGN maintains its view that this approach would best achieve the ARORO. This approach leads to an estimate of the prevailing return on equity of 9.76%.

However if the AER proposes to continue relying solely on the SL CAPM to estimate the return on equity, it becomes even more important that the estimates of the MRP and equity beta are calculated in a manner that has proper regard to relevant material in order to ensure that its estimate of the return on equity is consistent with the ARORO and reflects prevailing market conditions. Of particular importance are the DGM estimates for the MRP and evidence from wider datasets for the equity beta.

This Revised AA Proposal outlines an alternative approach that involves properly adjusting SL CAPM parameters to deliver a return on equity that contributes to the achievement of the ARORO and reflects prevailing market conditions. This involves:

- determining a robust 'starting point' equity beta estimate, based on a sufficiently large sample of comparable businesses;

- making a transparent and empirically based adjustment to the equity beta estimate to account for the known shortcomings of the SL CAPM, particularly low beta bias and book-to-market bias; and

- deriving the MRP in a way that gives appropriate weight to measures of the prevailing market conditions (i.e. the prevailing MRP).

This alternative approach leads to an estimate of the prevailing return on equity of 9.84%.

1.3.4 Gearing

AGN maintains its proposed gearing ratio of 60%, accepted by the AER in the Draft Decision. AGN notes that this gearing assumption is broadly consistent with evidence of gearing ratios for businesses operating in a workably competitive market providing services similar to reference services.

1.3.5 Interrelationships

There is a well-recognised interrelationship between the return on equity and the value of imputation credits – since the MRP needs to be grossed up for the value of imputation credits, a higher theta estimate implies a higher required return on equity.

- This interrelationship is accounted for in this Revised AA Proposal and the supporting expert advice.

- If the AER were to reduce its estimate of theta to 0.35, while maintaining its current approach to estimating the MRP, no adjustment to the AER's MRP estimate would be necessary. This is because the top of the AER's range of estimates of the historical average MRP (used by the AER as its MRP point estimate) would remain at 6.5%.[15]

There is also an interrelationship between the method for forecasting inflation and the amount that is deducted from the annual revenue requirement for indexation of the capital base, and between the allowed rate of return and the method for forecasting inflation. Due to these interrelationships, the forecast of inflation needs to be accurate (i.e. as close as possible to actual inflation, which is used to roll forward the capital base at the end of the AA period) and consistent with the implied forecast of inflation in the nominal rate of return. The best way to do this is to rely on the same dataset (i.e. market prices of securities) to estimate both.

AGN does not accept that there is an interrelationship between the method for transitioning to the trailing average approach to estimating the return on debt and the equity beta. As noted by Chairmont, the required return on equity is not affected by the DRP mismatch risk as it is a diversifiable specific risk rather than a component of market systematic risk.[16] Therefore any change in the AER's approach to estimation of the return on debt (including any change to the transition method) will not affect the equity beta.

Finally, AGN considers that the return on equity and return on debt need to be estimated on the basis of a consistent approach to the ARORO. As explained below, AGN's proposed approaches to estimating the return on equity, return on debt and the overall rate of return, as set out in section 1.8 below, are consistent with the approach to the ARORO described in section 1.3.1 above.

1.4 AGN Response to the Draft Decision - Background

1.4.1 Recent changes to the rate of return rules

As has been noted by AGN, the rules relating to the allowed rate of return and gamma were amended in November 2012 (the 2012 Rule Amendment). A key aspect of the November 2012 rule changes was the

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15 For reasons set out in section 1.6.4, AGN does not agree with the AER's approach to estimating the MRP. However we note that if the AER were to maintain the same approach to estimating the MRP while lowering its estimate of theta, its estimate of the MRP would not need to change.

16 Chairmont, *Financing Practices Under Regulation: Past and Transitional*, 13 October 2015, p40.

removal of the requirement to estimate the return on equity using the SL CAPM. This was replaced with a requirement to estimate the return on equity such that it contributes to the achievement of the AROR0, having regard to relevant estimation methods, financial models, market data and other evidence.

In making the rule amendments, the Australian Energy Market Commission (AEMC) stated that the amendments provided the regulator with the flexibility to adopt the approach it considers appropriate to estimate the rate of return, "*provided it considers relevant estimation methods, financial models, market data and other information*". The AEMC noted that:[17]

> *"This is so the best estimate of the rate of return can be obtained that reflects efficient financing costs of the service provider at the time of the regulatory determination.*
>
> *In this way, the regulator can better respond to changing financial market conditions, particularly where volatile market conditions impact on a service provider's ability to attract sufficient capital to finance the expenditure necessary to provide a reliable energy supply to consumers."*

In relation to the return on equity, one of the key drivers of the rule changes was a concern that estimation of the return on equity had become overly formulaic, and unduly bound to a single model (the SL CAPM). Such a concern was expressed by the Expert Panel on Limited Merits Review (emphasis added):[18]

> *"Put bluntly, at the moment the AER is required to proceed, as a matter of law, on the basis of a model that is known to abstract from a factor considered (in the Panel's view, rightly) to be a matter of such significance (i.e. regulatory risk or uncertainty) that it is afforded special mention in the revenue and pricing principles section of the NEL [National Electricity Rules].*
>
> *That this is more than a theoretical point is indicated by the fact that the Financial Investors Group told us that they had been concerned about the narrow, CAPM focus of the regulatory approach to date, and had urged the AER to pay more attention to conditions in capital markets themselves (in contrast to models of those markets). Whilst the Panel believes that the AER has rather more discretion than the AER itself appears to believe it has, it does appear to be the case that there is an inconsistency in the current combination of laws and rules that is impeding a more realistic, market-focused approach to the determination of returns on capital.*
>
> *The practical relevance of the problem has also been illustrated by the ACT's recent ATCO decision, the detail of which the Panel has not yet had time to fully absorb. In the name of regulatory certainty, the decision appears to elevate the standing of the CAPM in the NGR to something akin to its standing in the NER [National Electricity Rules]. The Panel is concerned that binding regulatory decisions hand and foot to a financial model **with known defects** does not immediately commend itself as an approach that will advance the NEO [National Electricity Objective] and NGO."*

The AEMC echoed this concern in its rule determinations, and accordingly sought to devise a new framework for estimating the rate of return that would require consideration of a wider range of models and estimation techniques. In its draft rule determination, the AEMC stated (emphasis added):[19]

> *"The rate of return estimation should not be formulaic and be driven by a single financial model or estimation method. The estimation approach to equity and debt components should*

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17 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*, November 2012, p iii.

18 Professor George Yarrow, The Hon Michael Egan, Dr John Tamblyn, *Review of the Limited Merits Review Regime: Stage One Report*, 29 June 2012, pp41-42.

19 AEMC, *Draft Rule Determinations: Draft National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; Draft National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, August 2012, p47.

> *include consideration of available estimation methods, financial models, market data and other evidence to produce a robust estimate that meets the overall rate of return objective. This means giving the regulator discretion on how it should estimate these components, rather than limiting the estimation process to a particular financial model or a particular data source. In the context of estimating the return on equity, the estimation should not be limited to the standard CAPM, but should consider other relevant evidence."*

The AEMC, like the Expert Panel on Limited Merits Review, clearly considered that an estimation approach that was limited to a single model would not best meet the NGO and the revenue and pricing principles (RPP). Rather the AEMC considered that estimates are likely to be more robust and reliable if they are based on a range of estimation methods. The AEMC explained (emphasis added):[20]

> *"There are a number of other financial models that have varying degrees of weaknesses. Some of the financial models that have gained some prominence include the Fama-French three-factor model, the Black CAPM, and the dividend growth model. Weaknesses in a model do not necessarily invalidate the usefulness of the model. Ultimately, it is important to keep in mind that all these financial models are based on certain theoretical assumptions and no one model can be said to provide the right answer.*
>
> *Given that there are other financial models and methods for estimating the cost of equity capital that vary in their acceptance academically and consequent usage by market practitioners, restricting consideration to the CAPM alone would preclude consideration of other relevant estimation methods.*
>
> *The Commission is of the view that estimates are more robust and reliable if they are based on a range of estimation methods, financial models, market data and other evidence. A framework that eliminates any relevant evidence from consideration is unlikely to produce robust and reliable estimates, and consequently is unlikely to best meet the NEO, the NGO and the RPP."*

The changes to the return on debt rules were at least partly driven by a concern that the "on-the-day" approach to estimating the return on debt previously required by the NGR did not reflect efficient financing practices engaged in by businesses operating in competitive markets. The AEMC considered that the NGO would be advanced by an approach that better aligned with efficient financing and risk management practices that might be expected in the absence of regulation.

In the final determination in relation to the 2012 Rule Amendment, the AEMC indicated that one of its fundamental policy objectives in amending the allowed rate of return framework was to provide flexibility to take account of changing market conditions by making necessary adjustments to the method for estimating the return on debt.[21]

The AEMC emphasised the intention of the amended rule to align the return on debt estimate with the return required by investors of debt capital issued by a benchmark efficient service provider:[22]

> *"The return on debt estimate represents the return that investors of debt capital would require from a benchmark efficient service provider. Aligning the return on debt estimate with the efficient expected cost of debt of a service provider is therefore an important element in determining the rate of return."*

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20 AEMC, *Draft Rule Determinations: Draft National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012; Draft National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, August 2012, p48.

21 AEMC, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper*, 29 November 2012, pp44, 45-46, 49 and 55-56.

22 AEMC, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper*, 29 November 2012, p73.

The 2012 Rule Amendment amended NGR 87 to explicitly permit the return on debt methodology to be designed to reflect an average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period. The AEMC considered that the amendment would permit the adoption of the trailing average approach to estimate the return on debt, which would better align efficient debt costs with the regulatory allowance.[23]

> *"The Commission's rate of return framework draft rule proposal provides the flexibility for the regulator to consider alternative approaches to estimating the return on debt, including historical trailing average approaches that may better align the debt servicing costs of an efficiently run service provider with the regulatory estimate of the return on debt."*

While the amended rules did not specify the methodology to be used to estimate the return on debt, the AEMC was clear in the guidance set out in its final rule determination that whatever methodology was used, it should result in a regulatory allowance for the return on debt that reflects financing practices (and ultimately costs) that, insofar as possible, would be expected absent regulation.[24]

> *"In its draft rule determination, the Commission considered that the long-term interests of consumers would be best served by ensuring that the methodology used to estimate the return on debt reflects, to the extent possible, the efficient financing and risk management practices that might be expected in the absence of regulation."*

The AEMC went on to consider whether it should depart from this approach in the draft determination, and concluded that (relevantly) there should be no change. Further, the AEMC observed that the NGO and the RPP are more likely to be met by a methodology that allows the AER to more accurately match debt conditions in the market for funds.[25]

1.4.2 The ARORO

Under the rules as amended by the AEMC, the ARORO is the touchstone for estimating both the return on equity and the return on debt. The NGR require that:

- the return on equity for an AA period be estimated such that it contributes to the achievement of the ARORO;[26] and
- the return on debt for a regulatory year be estimated such that it contributes to the achievement of the ARORO.[27]

The ARORO is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a BEE with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.[28]

As can be seen, the ARORO has two key elements:

- firstly, the ARORO requires identification of the level of risk that applies to the service provider in respect of the provision of reference services; and

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23 AEMC, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Draft Rule Determinations*, 23 August 2012, p78.
24 AEMC, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper*, 29 November 2012, p76.
25 AEMC, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper*, 29 November 2012, p86.
26 NER 87(6).
27 NER 87(8).
28 NER 87(3).

- secondly, the ARORO requires estimation of efficient financing costs for a BEE facing a similar degree of risk as that service provider.

AGN considers that the relevant level of risk is that faced by entities operating in a workably competitive market providing services similar to reference services within Australia. Therefore, in constructing comparator datasets for the purposes of estimating a rate of return that is commensurate with efficient financing costs of a BEE, these datasets should include entities that face a similar degree of risk to that faced in the provision of reference services. That is, they should not be restricted to regulated entities. For example, as will be discussed below:

- in estimating the equity beta for a BEE facing a similar degree of risk as that which applies to the service provider in respect of the provision of reference services, businesses in other sectors and other countries facing a similar degree of risk should be included in the dataset; and

- in estimating the return on debt, yields should be measured using benchmark indices for the relevant credit rating band, with those indices reflecting bond yields across a wide range of businesses within that credit rating band (i.e. a range of different businesses facing a similar degree of risk, including businesses operating in competitive markets).

If AGN is incorrect that the relevant level of risk is that faced by entities operating in a workably competitive market providing services similar to reference services within Australia, but rather, the relevant level of risk is that of a regulated energy network business subject to economic regulation under the NGL, AGN submits that the reference to 'efficient financing costs' in the ARORO is to costs incurred (and therefore financing practices adopted) in a workably competitive market to finance an investment with that risk profile.

Moreover, even if the relevant level of risk is that of a regulated energy network business subject to economic regulation under the NGL, in many cases it will be necessary to look beyond just those businesses that supply regulated energy network services within Australia in order to produce sufficiently large datasets for the estimation of risk parameters. Specifically in the context of equity beta, given that the sample of Australian energy network businesses is too small, the dataset for estimating risk parameters needs to be enlarged by adding other businesses facing a similar degree of risk.

Once the relevant degree of risk is established, the task is then to estimate the efficient financing costs of a BEE facing a similar degree of risk. As noted above, regardless of what the relevant degree of risk is, once this risk benchmark is established, the assessment of efficient financing costs requires consideration of what financing practices would be engaged in by businesses operating in a workably competitive market, facing the relevant degree of risk. Such an interpretation of the term 'efficient financing costs' in the ARORO is consistent with the object of regulation itself—which is to simulate competitive market outcomes. This is because it is ultimately competition that drives efficient behaviour.

The rationale of economic regulation of network assets is to, insofar as possible, mimic the operation of, and replicate the outcomes in, a workably competitive market. This is because, by reason of the adjustments to quantity and pricing that occur in response to changes in these markets, it is in such markets that economic efficiency is achieved. For example, the Expert Panel on Energy Access Pricing has noted:[29]

> *"The central objective of price control is to constrain the exercise of market power by firms that do not face effective competition for their services. Regulation and, specifically, the periodic determination of maximum prices or revenue is directed at achieving outcomes that could otherwise be expected from effective competition."*

The Expert Panel noted that regulatory regimes typically set prices by reference to costs because costs associated with supply are a central element of pricing outcomes in competitive markets.[30]

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29 Expert Panel on Energy Access Pricing, *Report to the Ministerial Council on Energy*, April 2006, p118.
30 Expert Panel on Energy Access Pricing, *Report to the Ministerial Council on Energy*, April 2006, p98.

> *"Virtually all regulatory regimes set controlled prices by reference to an assessment of costs. The reason is that the cost of supply – in conjunction with the role of consumer preferences in determining the appropriate service and product mix – is a primary driver of price outcomes in effectively competitive markets."*

The AEMC has commented on the objective of regulation in similar terms to the Expert Panel.[31]

> *"The role of incentives in regulation can be traced to the fundamental objective of regulation. That is, to reproduce, to the extent possible, the production and pricing outcomes that would occur in a workably competitive market in circumstances where the development of a competitive market is not economically feasible."*

The AEMC has also noted that regulatory arrangements attempt to mimic competitive markets given that economic efficiency is achieved in those markets. In the context of electricity transmission, which is subject to a similar regulatory framework to gas distribution, the AEMC stated:[32]

> *"TNSPs, like most businesses, operate in an uncertain environment. Uncontrollable, external events as diverse as changes in economic growth, climate and regulatory obligations can alter the quantity and nature of the services required to be provided by TNSPs. In a normal competitive market, production and pricing behaviour adjusts in response these changes. In these markets, efficient producers are able to recover their costs and should generally earn at least a normal return on their investments. As highlighted above, the regulatory arrangements need to mimic the operation of a competitive market as closely as possible."*

The term "workably competitive market" refers to a market in which no firm has a substantial degree of market power and in which market forces increase efficiency beyond that which could be achieved in a non-competitive market, even if perfect competition is not attained. These concepts were explored by the Western Australian Supreme Court in the context of section 8.1 of the Gas Code that set out general principles applying to reference tariffs, which included that reference tariffs should be designed with a view to achieving the objective of replicating the outcome of a competitive market.[33]

> *"Workable competition is said originally to have been developed over half a century ago by anti-trust economists. In simple terms it indicates a market in which no firm has a substantial degree of market power… I am left with the clear impression that in the field of competition policy, especially market regulation, the prevailing view and usage among economists is that a reference to a competitive market is to a workably competitive market. In the particular context of the promotion of a competitive market for natural gas it would be surprising if what was contemplated was a theoretical concept of perfect competition, as the subject matter involves very real-life commercial situations. Workable competition seems far more obviously to be what is contemplated. This is clearly consistent with the approach of the Hilmer Report…"*

The Court went on to set out its interpretation of the requirement to replicate the outcome of a competitive market in the context of a regulatory framework applying to monopoly infrastructure.[34]

> *"What is in contemplation in s 8.1(b) is a competitive market in the field of gas transportation. The objective is to replicate what would be the outcome if there was competition for the transportation of gas by the pipeline in question, even though it is the premise of the Act and the Code that the pipeline is in a monopoly situation and it would be uneconomic to construct*

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31 AEMC, *Draft National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006*, Rule Determination, 16 November 2006, p96.

32 See for example: AEMC, *National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006*, Rule Determination, 16 November 2006, p54; and AEMC, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper*, 29 November 2012, p182.

33 *Re Dr Ken Michael AM; Ex parte Epic Energy (WA) Nominees Pty Ltd* [2002] WASCA 231, [124].

34 *Re Dr Ken Michael AM; Ex parte Epic Energy (WA) Nominees Pty Ltd* [2002] WASCA 231, [127].

> *another. The objective seems to necessitate the application of economic methods and theory, albeit to replicate the outcome of a workably competitive market, because the achievement of competition in fact is not possible."*

The Court then discussed the relationship between efficiency and the outcomes of a workably competitive market, noting that the revenues earned from the provision of services in a workably competitive market would approximate efficient costs.[35]

> *"Section 8.1(b) provides that a reference tariff should be designed with a view to replicating the outcome of a competitive market, ie as indicated earlier, a workably competitive market. The discussion of the concept of a competitive market earlier in these reasons, especially the close interrelationship recognised by economists between the role of a competitive market and the achievement of economic efficiency, suggests that s 8.1(b) and s 8.1(a) are more complementary than antithetical, although they need not always be in harmony. As far as the expert evidence discloses, a competitive market in the sense of a workably competitive market appears to be viewed by the general body of economic opinion as likely, over time, to lead to economic efficiency or at least to greater economic efficiency. As the Hilmer Report puts it, the promotion of effective competition is generally consistent with maximising economic efficiency. This would suggest that, over time, the revenue earned by a service provider from a reference service, if that service was provided in a workably competitive market, would approximate the efficient costs of delivering the service. That also helps to confirm that the concept of efficient costs, like the outcome of a workably competitive market, is not capable of precise or certain calculation and at best, can only be approximated. Both are based on many assumptions. How best to determine the efficient level of costs or the outcome of a competitive market are matters of economic theory and practice which, on the evidence, are in the course of constant revision, development and refinement."*

In the context of gas regulation by the NGL and NGR, the AER has also drawn the connection between the efficiency objective and the recovery of costs that would be incurred in a workably competitive market.[36]

> *"The AER submitted that rule 91 requires the AER to permit service providers a reasonable opportunity to recover what the AER considers "legitimate costs". Legitimacy, according to the AER is informed by the NGO and, in particular, means costs that would be incurred in a "workably competitive market". The requirement for replication of a workably competitive market outcome is said to be derived from the intent of the regulatory framework."*

The Tribunal has confirmed that the NGL and the NGR "*seek to ensure that an NSP operates and invests efficiently in the manner of a firm in a competitive environment*".[37] It is implicit in the Tribunal's observations that the Tribunal accepted the notion that "efficient costs" are those that would be incurred by the hypothetical business in a workably competitive market.

The term "efficient" in the ARORO is to be interpreted consistently with how that term is used elsewhere in the regulatory regime. Most relevantly the term "efficient" appears in the NGO and the RPP.

The second reading speech made on the introduction of the Bill which contained the National Electricity Law (NEL) with the current national electricity objective (NEO) noted the following with respect to the NEO (which is in equivalent terms to the NGO):[38]

> *"The national electricity market objective in the new National Electricity Law is to promote efficient investment in, and efficient use of, electricity services for the long term interests of*

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35 *Re Dr Ken Michael AM; Ex parte Epic Energy (WA) Nominees Pty Ltd* [2002] WASCA 231, [143]. Section 8.1(a) of the Code referred to the objective of providing the service provider with the opportunity to earn a stream of revenue that recovers the efficient costs of delivering the reference service over the expected life of the assets used in delivering that service.

36 *Application by Envestra Ltd (No 2)* [2012] ACompT 3, [183].

37 *Application by EnergyAustralia and Others* [2009] ACompT 8, [106].

38 South Australia, *Parliamentary Debates*, House of Assembly, 9 February 2005, 1452 (John David Hill).

> *consumers of electricity with respect to price, quality, reliability and security of supply of electricity, and the safety, reliability and security of the national electricity system.*
>
> *The market objective is an economic concept and should be interpreted as such. For example, investment in and use of electricity services will be efficient when services are supplied in the long run at least cost, resources including infrastructure are used to deliver the greatest possible benefit and there is innovation and investment in response to changes in consumer needs and productive opportunities.*
>
> *The long term interest of consumers of electricity requires the economic welfare of consumers, over the long term, to be maximised. If the National Electricity Market is efficient in an economic sense the long term economic interests of consumers in respect of price, quality, reliability, safety and security of electricity services will be maximised.*
>
> *…*
>
> *It is important to note that all participating jurisdictions remain committed to the goals expressed in the current market objectives set out in the old Code, even though they are not expressly referred to in the new single market objectives. Applying an objective of economic efficiency recognises that, in a general sense, the national electricity market should be competitive…"*

The AER has previously referred to this text of the second reading speech, noting that the NGO is fundamentally an efficiency objective and that the NGO seeks to emulate effectively competitive market outcomes.[39]

> *"In a competitive market, a firm has a continuous incentive to respond to consumer needs at the lowest cost (that is, operate efficiently) because competition may force it to exit the market if it does not. In addition, the firm has an incentive to improve its efficiency because it will enjoy greater market share if it can provide the best service at the lowest cost to the consumer. Essentially, the NEO imposes the pressures of competition on natural monopolies."*

In its report on energy access pricing the Expert Panel also referred to the second reading speech text extracted above and noted that "*the elements of productive, allocative and dynamic efficiency, neatly encapsulated in the first paragraph of the extract, are at the core of the objective*".[40]

The term "efficient" is also used in other provisions of the NGR, including NGR 79 and 91 relating to forecast operating and capital expenditure. The AER has interpreted "efficient costs" in the context of the expenditure provisions of the NGR as being "*those expected costs based on outcomes in a workably competitive market*".[41]

It is a principle of statutory interpretation that where a word is used consistently in legislation it should be given the same meaning.[42] Further, the NGL provides that words and expressions used in the NGR have the same meaning as they have in the NGL.[43] Therefore, the term "efficient" in the ARORO is to be given the same meaning as "efficient" in the NGO. Further, in construing the term "efficient costs" where it appears in the NGR, the interpretation that will best achieve the purpose of object of the NGL is to be preferred to any other interpretation.[44] As such, the term "efficient costs" is to be construed consistently with the economic concept of efficiency with which, as set out in detail above, it is well accepted the NGO is concerned.

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39 AER, *Expenditure Forecast Assessment Guideline: Explanatory Statement*, November 2013, p17.
40 Expert Panel on Energy Access Pricing, *Report to the Ministerial Council on Energy*, April 2006, p37.
41 AER, *Expenditure Forecast Assessment Guideline: Explanatory Statement*, November 2013, p47.
42 See discussion in: D Pearce and R Geddes, *Statutory Interpretation in Australia* (LexisNexis Butterworths, 2014), pp 150-151.
43 NGL, Schedule 2, cl 13(1). See also NGL, s20 and NGL, Schedule 2, cl 51.
44 NGL, Schedule 2, cl 7. See also NGL, s20 and NGL, Schedule 2, cl 51.

An interpretation of the term "efficient costs" in the ARORO as being the costs that would be incurred in a workably competitive market is consistent with the intent of the AEMC, as stated in its final position paper accompanying the 2012 Rule Amendment. As noted above in the context of the return on debt, the AEMC made clear that the NGO would be best served by adoption of a return on debt estimation methodology that reflects the efficient financing and risk management practices that might be expected in the absence of regulation.[45]

In this connection it may also be observed that what is relevant to the estimation of the return on debt is the return required by debt investors. This return is largely (or wholly) unaffected by the methodology adopted by the regulator to estimate the return on debt allowance. As such, it should be clear that efficient financing costs are those that would be incurred absent regulation and cannot be defined by reference to how a regulated entity might respond to any particular methodology adopted by the regulator to estimate the return on debt.

It may also be observed from the AEMC material that the intention of the 2012 Rule Amendment is to align the regulatory estimate with the return that investors of debt capital would require from a benchmark efficient service provider.[46] The regulatory methodology does not determine those costs. Rather, it must be responsive to such costs – they have existence independent of the regulatory methodology and the regulatory methodology must be designed to capture them.

Consistent with the statements of the AEMC set out in section 1.4.1 above, the long term interests of consumers are best served by ensuring that the methodology used to estimate the return on debt reflects, to the extent possible, the efficient financing and risk management practices that might be expected in the absence of regulation. Specifically with regard to the determination of the characteristics of the BEE, the AEMC stated that the most appropriate benchmark to use in the regulatory framework for all service providers is the efficient private sector service provider.[47]

The AER itself appears to recognise that in estimating the financing costs of a regulated business under the NGR, these should be consistent with what would be expected in the context of unregulated efficient businesses.[48]

> *"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. 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."*

Identifying efficient financing practices by reference to the incentives created by a particular regulatory approach avoids the very object of the regulatory regime—being to, insofar as possible, create an environment in which the costs incurred (and ultimately allowed to be recovered) are efficient costs. The correct enquiry starts with an identification of what are efficient costs, and then a methodology is designed that, insofar as possible, permits those efficient costs to be recovered.

A paper published by the ACCC and AER's Regulatory Development Branch summarises the point accurately:[49]

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45 AEMC, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper*, 29 November 2012, p76.

46 AEMC, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper*, 29 November 2012, p73.

47 AEMC, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services, Final Position Paper*, 29 November 2012, p72.

48 AER, *Rate of Return Guideline: Explanatory Statement*, December 2013, p28.

49 Regulatory Development Branch, Australian Competition and Consumer Commission (H Smyczynski and I Popovic), *Estimating the Cost of Debt: A Possible Way Forward*, April 2013, p11.

> *"…when determining a new regulatory cost of debt approach, debt practices which are a product of the regulatory environment should be ignored. This is because these practices will change if the regulatory environment changes. If in setting a new regulatory framework, a regulator considers debt practices that are a result of businesses reacting to the existing regulatory framework, it may create a self fulfilling method that may not necessarily be efficient…*
>
> *The use of swap contracts to lock in the cost of debt for the access arrangement is a consequence of the regulatory framework, and their use by regulated businesses would change if the regulatory framework were to change. Ideally the regulatory framework for the cost of debt should reflect the efficient debt practices that occur in a competitive market. This would align competitive incentives with regulatory incentives."*

In short, the ARORO requires the formulation of methodologies to be used to estimate the rate of return, including the return on debt, that, insofar as possible, provide a return that is commensurate with forward-looking efficient costs, being the costs that would be incurred in a workably competitive market. Any other approach would lead to the absurd and circular result that any cost incurred is efficient where the regulatory approach provides an incentive for it to be incurred, even though it would not be incurred in a workably competitive market. Such an approach is inconsistent with the objective of the regulatory regime.

1.4.3 Matters that the AER must have regard to in estimating the rate of return

Regard must be had to several relevant matters in estimating the rate of return, including:[50]

- 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.

This requirement reflects the view of the AEMC, referred to above, that no one model or method can be said to provide the 'right' answer, and that estimates are more robust and reliable if they are based on a range of estimation methods, financial models, market data and other evidence.

In estimating the return on equity, regard must also be had to the prevailing conditions in the market for equity funds.[51]

In estimating the return on debt, the NGR also require that regard be had to the following four factors:[52]

- the desirability of minimising any difference between the allowed return on debt and the return on debt of a BEE referred to in the ARORO;
- any interrelationship between the return on equity and the return on debt;
- the incentives that the return on debt may provide in relation to capital expenditure over the AA period, including as to the timing of any capital expenditure; and

[50] NGR 87(5).
[51] NGR 87(7).
[52] NGR 87(11).

- any impacts (including in relation to the costs of servicing debt across AA periods) on a BEE referred to in the ARORO that could arise as a result of changing the methodology that is used to estimate the return on debt from one AA period to the next.

1.4.4 Achieving the NGO

Providing for an overall return that is consistent with the ARORO is necessary to promote efficient investment in, and efficient operation and use of, gas services for the long term interests of consumers, consistent with the NGO.

If the level of return is set too low, AGN may not be able to attract sufficient funds to make the required investments in the network and reliability and service standards may decline.

1.5 AGN Response to the Draft Decision – Return on debt

1.5.1 Introduction

The AER's Draft Decision in relation to the return on debt is to maintain the return on debt methodology proposed in the Rate of Return Guideline.[53] That is, applied to AGN's AA period, the AER's Draft Decision on the return on debt is to:

- estimate the return on debt using an on-the-day rate in the first regulatory year (2016/17) of the 2016/17 to 2020/21 AA period; and
- transition this rate into a trailing average approach over 10 years by updating 10% of the return on debt each year to reflect prevailing interest rates.[54]

The AER's Draft Decision on implementing the return on debt approach involves using:

- a benchmark credit rating of BBB+;
- a benchmark term of debt of 10 years;
- a simple average of the broad BBB rated debt data series published by the RBA and Bloomberg, adjusted to reflect a 10 year estimate and other adjustments; and
- an averaging period for each regulatory year of between 10 business days and 12 months (nominated by the service provider) that finishes no later than 25 days before submission of the annual pricing proposal or reference tariff variation proposal.[55]

AGN submits that in the Final Decision, the return on debt should be estimated using the trailing average approach. AGN agrees that the trailing average approach should be adopted to estimate the return on debt because infrastructure businesses operating in workably competitive markets would be expected to hold a staggered portfolio of fixed rate debt and the costs of holding such a portfolio are best approximated by the trailing average approach to estimating the return on debt.

However, AGN does not agree that the AER's proposed 10-year transition to the trailing average approach should be adopted. Rather, AGN submits that there should be no transition to the trailing average approach. The reference to "efficient financing costs" in NGR 87(3) can only be understood to be the costs that would be incurred in a workably competitive market—this is what efficient financing costs are. As the debt financing practice that would be expected absent regulation is to hold a staggered portfolio of fixed-rate debt, and the

[53] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-144.
[54] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-145.
[55] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-149 to 150.

trailing average approach provides an estimate of the return on debt that is commensurate with this practice, the NGR require the immediate adoption of the trailing average approach.

Although AGN proposed a 10-year transition in its Initial AA Proposal, its (hybrid) transition was rejected by the AER in the Draft Decision. AGN also noted in its Initial AA Proposal that, if the AER is correct in its view that there is only one single benchmark efficient debt management strategy, then the correct single benchmark would reflect a full trailing average approach without any transition, being the efficient approach that is in fact replicable by all firms, rather than the methodology replicable by only some firms. AGN adopts that position as its primary position in this Revised AA Proposal.

If AGN is incorrect that the efficient financing costs of a BEE are to be estimated by reference to the costs that would be incurred in a workably competitive market, and the AER is correct to estimate the return on debt by reference to efficient financing costs incurred by a BEE subject to economic regulation under the NGR, AGN submits that the AER should adopt a "hybrid" transitional approach. The hybrid approach involves:

- for the base rate component of the return on debt, adopting:

  – a 10 year transition to a trailing average for the proportion of the debt portfolio assumed to have been hedged by the BEE using interest rate swaps; and

  – no transition for the proportion of the debt portfolio assumed not to have been hedged by the BEE (that is, moving immediately to the trailing average approach); and

- for the debt margin (or DRP) component, applying no transition by moving immediately to the trailing average approach from the first year of the 2016/17 AA period.

AGN refers to and repeats its cost of debt position regarding the three approaches referred to in this Revised AA Proposal, as set out at the end of section 1.2 above.

In respect of the implementation issues, AGN submits that in making its Final Decision, the AER should:

- adopt a benchmark credit rating of BBB+, as in the Draft Decision;
- continue to adopt a benchmark term of 10 years;
- in the first regulatory year of the AA period, calculate the rate of return as the sum of the base rate and the DRP, calculated as set out in section 1.5.5 below;
- update the rate of return annually in subsequent regulatory years of the AA period as set out in section 1.5.6 below; and
- include a new issue premium of 27 basis points in the estimate of the return on debt for each regulatory year.

AGN's position on each of the above issues is addressed in detail below.

1.5.2 Trailing average approach

In the Rate of Return Guideline, the AER proposed to estimate the allowed return on debt using:

- a trailing average approach with the length of the trailing average being 10 years;
- equal weights to be applied to all the elements of the trailing average; and

- the trailing average to be automatically updated every regulatory year within the regulatory control period.[56]

AGN agrees with the proposed approach in the Rate of Return Guideline to estimate the return on debt using a trailing average approach. AGN agrees with the AER that the trailing average approach is likely to contribute to the achievement of the ARORO and recognises the desirability of minimising any difference between the allowed return on debt and the return on debt of a BEE referred to in the ARORO.[57] This includes because, as noted by the AER, the trailing average approach allows a service provider to manage both interest rate risk and refinancing risk, without the use of interest rate swaps, which are a product of the on-the-day approach.[58] As discussed below, the trailing average approach will provide an estimate of the return on debt that is commensurate with the financing costs that would be incurred by a firm operating in the manner of a firm in a competitive environment.

However, and as discussed in detail below, AGN does not agree with the proposed approach in the Rate of Return Guideline, and as adopted in the Draft Decision, to implement the trailing average approach after a period of transition.[59] That is, AGN submits as its primary position that the AER should immediately apply the trailing average approach without a transition. (AGN refers to and repeats its cost of debt position regarding the three approaches referred to in this Revised AA Proposal, as set out at the end of section 1.2 above.)

1.5.3 The AER's decision to impose a 10 year transition to the trailing average approach

1.5.3.1 The AER's view of efficient financing costs

In the Draft Decision the AER adopts the conceptual definition of the BEE as set out in the Rate of Return Guideline, namely: "*a pure play, regulated energy network business operating within Australia*".[60] In relation to the "regulated" aspect of this definition, the AER states: "*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*".[61]

The AER describes the efficient debt financing costs of a BEE in the following way:[62]

> *"…those which are expected to minimise its debt financing costs over the life of its assets, while managing refinancing risk and interest rate risk:*
>
> - *Refinancing risk—the risk that a benchmark efficient entity would not be able to refinance its debt when it matures.*
> - *Interest rate risk—the risk associated with a mismatch between the allowed return on debt and a benchmark efficient entity's actual return on debt."*

Having defined the BEE and the efficient debt financing costs of a BEE, the AER concludes that the efficient debt financing practices of the BEE under the previous on-the-day approach to estimating the return on debt would have involved the following:[63]

- borrowing long term (10 year) debt and staggering the borrowing so only a small proportion (around 10%) of the debt matured each year;

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56 AER, *Rate of Return Guideline*, December 2013, p19.
57 AER, *Rate of Return Guideline*, December 2013, p19.
58 AER, *Rate of Return Guideline: Explanatory Statement*, December 2013, p108.
59 AER, *Rate of Return Guideline*, December 2013, p19.
60 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-25.
61 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-26.
62 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-167.
63 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-187 to 188.

- borrowing using floating rate debt, or borrowing fixed rate debt and converting it to floating rate debt using fixed-to-floating interest rate swaps at the time of the debt issue, which extended for the term of the debt (10 years); and

- entering into floating-to-fixed interest rate swaps at, or around, the time of the service provider's averaging period, which extended for the term of the AA period (typically five years).

The AER concludes that, under the financing practice described above, the base rate component of the AER's BEE's actual return on debt would have broadly matched the on-the-day rate, while the DRP component each year would have reflected the average of the previous 10 years.[64]

Critical to the AER's findings as to efficient financing practices (and, in turn, efficient financing costs), is that such practices involve the BEE hedging the base rate component. It is uncontroversial that the financing practice as described above would only be engaged in under the on-the-day approach. However, efficient financing costs (achieved through the adoption of efficient financing practices) under the NGR should not be identified by reference to what a regulated entity might do in response to a particular methodology adopted by a regulator to calculate the return on debt allowance. Rather, as elaborated below, efficient financing costs are properly identified by reference to financing practices that would be adopted in workably competitive markets.

1.5.3.2 Efficient financing costs referred to in the ARORO

As noted in section 1.4.2 above, the term "efficient financing costs" in the ARORO is properly understood as referring to the costs that would be expected to be incurred in a workably competitive market.

A firm operating in the manner of a firm in a competitive environment would have a conventional debt portfolio of the type held by privately-owned entities in unregulated markets, namely a staggered portfolio of fixed rate debt.

This is confirmed by the AER's consultant, Chairmont, who states:[65]

> *"The decision to adopt a strategy of gradual staggered issuance of fixed rate debt is consistent with behaviour where the regulatory cost of debt framework does not apply."*

Similarly, CEG has found that unregulated businesses typically raise debt in a staggered manner.[66]

> *"In reality, almost all businesses, including regulated infrastructure businesses, raise debt in a staggered fashion over time. Moreover, for infrastructure businesses with very long lived assets, the average maturity of this debt at the time of issue tends to be long term (10 years or more). It is very likely that this is a response to a desire to minimise transaction costs, in particular insolvency/bankruptcy costs, that are heightened if too much debt must be refinanced in a short period of time. Consequently, a business's cost of debt at any given time will reflect the costs incurred when issuing debt over the last decade (i.e., not just over the last 20 days).*
>
> *…*

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64 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-188.

65 Chairmont, *Cost of Debt: Transitional Analysis*, April 2015, p38. At p38, Chairmont references UBS's statement that: '*The 'trailing average' approach used by Networks NSW was consistent with debt management strategies adopted by non-regulated entities in the infrastructure sector – ports, airports, road and railways'*: UBS, *UBS Response to the TransGrid Request for Interest Rate Risk Analysis following the AER Draft Decision of November 2014*, undated, p5. See also: Frontier, *Cost of Debt Transition for NSW Distribution Networks*, January 2015, pp8-9 (http://www.aer.gov.au/system/files/Ausgrid%20-%207.02%20-%20Frontier%20Economics%20-%20Cost%20of%20debt%20transition%20for%20NSW%20distribution%20businesses%20-%20January%202015.pdf).

66 CEG, *Efficiency of Staggered Debt Issuance*, February 2013, [92] and [97].

A 10 year trailing average approach would largely mimic the debt management strategy employed by infrastructure businesses (regulated and unregulated) around the world."

The debt financing costs of a staggered fixed rate debt portfolio match the debt costs calculated under the AER's trailing average approach. Put another way, the efficient financing costs of a BEE (being an unregulated entity operating in a workably competitive market) are the costs produced by application of the trailing average approach. Therefore, on a correct construction of the term 'efficient financing costs' in the ARORO, there is no basis for the imposition of a transition.

Having identified in the Rate of Return Guideline that the trailing average approach promotes the productive, allocative and dynamic efficiency of debt financing practices, and specifically provides incentives for service providers to seek the lowest debt financing costs,[67] and therefore, is consistent with the outcomes of a workably competitive market, the AER should have adopted the trailing average approach as the methodology to estimate the return on debt, without any transition.

Adoption of the AER's proposed transition would be inconsistent with the NGO and the RPP in providing an allowance for costs associated with financing practices adopted in response to a prior regulatory regime and would not impose an appropriate pricing signal for investment. That is, rather than sending a pricing signal that mimics the pricing signal that would be sent as a result of competition in a workably competitive market, the pricing signal sent under the AER's approach would be that arising from the idiosyncratic application of a prior regulatory methodology to estimating the return on debt.

In the Draft Decision, the AER states that it is not satisfied that immediate application of the trailing average approach is reasonable or would contribute to the achievement of the ARORO.[68] The reasons given by the AER are that:

- it has the potential to create a bias in regulatory decision making that can arise from the selection of historical data after the results of that data are already known;
- it would exaggerate a mismatch between the allowed rate of return on debt and the efficient financing costs of a BEE over the life of its assets, with the consequence that over the life of the assets a BEE is likely to materially either over- or under-recover its efficient financing costs; and
- it does not approximately match the allowed return on debt with the efficient financing costs of a BEE over the 2016/17 to 2020/21 AA period as it transitions its financing practices to the trailing average approach.[69]

If AGN is correct that the term "efficient costs" is to be interpreted as the costs that would be incurred in a workably competitive market, immediate adoption of the trailing average approach will approximately match the allowed return on debt with the efficient financing costs of a BEE. Therefore, the last point in the list above is not a reason to delay the immediate application of the trailing average approach.

In relation to the first two points in the list above, being the introduction of bias into regulatory decision making and violations of the NPV=0 principle, AGN submits that these policy issues are not relevant under the NGL and the NGR decision-making framework and that, even if they were, they do not support the AER's transition. These points are discussed below in the context of the hybrid approach.

If AGN is incorrect and efficient financing practices (and, in turn, efficient financing costs under the ARORO) are to be determined by reference to what a benchmark entity would be expected to do in response to the regulatory framework, there is no sound basis upon which a transition should be applied to the DRP component of the return on debt. This issue is discussed below.

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67 AER, *Draft Rate of Return Guideline: Explanatory Statement*, August 2013, pp83-84.

68 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-166.

69 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-166 to 167.

1.5.3.3 Even if the AER's view of efficient financing costs is correct, it has adopted the wrong transition

As the AER acknowledges, the DRP component of the return on debt cannot be—and thus in and prior to the 2011/12 to 2015/16 AA period could not have been—hedged.[70]

> *"For the debt risk premium component, we consider the allowed and actual return on debt of a benchmark efficient entity would have usually differed in each access arrangement period. This is because the DRP component could not have been efficiently hedged to the allowed debt risk premium. So, in some access arrangement periods, the allowed debt risk premium would have exceeded the actual debt risk premium of a benchmark efficient entity. In other access arrangement periods, the allowed debt risk premium would have been less than the actual debt risk premium…."*

Therefore, even if hedging strategies under the previous regulatory approach were relevant, it logically follows from the fact that the DRP component could not have been hedged that no transition should be applied to the DRP component and a trailing average approach should be immediately adopted. This is the advice given by Chairmont to the AER in Chairmont's April 2015 report:

> *"The DRP does not need to be transitioned because the NSP already has a staggered floating rate debt portfolio."*[71]

> *"A [benchmark efficient entity] will already have a staggered DRP in its portfolio, but not evenly distributed, i.e. not smooth. Therefore, to match this situation the AER should not transition the DRP, but instead move immediately to a 'trailing average' for this element. As there is no standard methodology to account for the non-smooth portfolio, AER should adopt a smooth 'trailing average' for the DRP. It is acknowledged that the measurement of historical DRP is difficult, because it is accurate only at the time of debt issuance; however it is likely that a reasonable estimate could be determined…"*[72]

The October 2015 Chairmont report reiterated that, if the AER's identified efficient financing practice was to be adopted, consistency required that a trailing average DRP be applied. The report stated that as a consequence of the efficient financing practice adopted by the AER, "*the allowed return on debt should be calculated in line with the Basic Approach, i.e. a trailing average DRP*".[73]

Chairmont concluded that the AER's "Basic Approach" to efficient financing practices, which involves entities hedging the base rate component of the return on debt and having a trailing average DRP, minimises differences between the regulated return on debt and the actual cost of debt faced by a BEE in the transition phase.[74]

> *"The Basic Approach to EFP [efficient financing practices], i.e. the trailing average DRP plus the average 1-10 year swap rates, minimises any discrepancy between the allowed and actual cost of debt in the transition phase for a BEE [benchmark efficient entity], whereas the Guideline Allowance does not."*

In the Draft Decision, the AER agreed with Chairmont that the hybrid approach would provide a good match over the 10 year transition period to the costs of the AER's BEE.[75] However, the AER determined that it would not adopt the hybrid approach in calculating the return on debt.[76]

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70 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-177.
71 Chairmont, *Cost of Debt: Transitional Analysis*, April 2015, pp8-9.
72 Chairmont, *Cost of Debt: Transitional Analysis*, April 2015, p47.
73 Chairmont, *Financing Practices Under Regulation: Past and Transitional*, 13 October 2015, p14.
74 Chairmont, *Financing Practices Under Regulation: Past and Transitional*, 13 October 2015, p13.
75 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-165.
76 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-165.

> *"We agree with Chairmont that the hybrid approach will provide a good match over the 10 year transition period to the costs of a benchmark efficient entity entering the transition from the 'on-the-day' regime. However, having regard to wider policy issues, we have maintained the Guideline approach. In particular we consider that proposal and adoption of the hybrid approach on the basis of changes in prevailing rates would introduce bias into regulatory decision making and violate the NPV=0 principle."*

There is no scope in the NGL and the NGR for regard to be had to these "wider policy" issues as they have been formulated by the AER. Even if these matters as formulated by the AER were properly to be considered in making a decision on the return on debt, neither the purported introduction of "bias" into regulatory decision making, nor alleged "violations" of the NPV=0 principle, provide a logical or reasoned basis to apply a transition to the DRP component of the return on debt.

Bias

In the Draft Decision, the AER states that the use of data from earlier periods—which is necessary under the trailing average approach—results in biased estimates and that use of unbiased estimates promotes the ARORO.[77]

> *"We consider the use of an unbiased estimate is of significant importance in achieving the allowed rate of return objective. This provides for the rate of return to be commensurate with the efficient financing costs of a benchmark efficient entity.*
>
> *We do not consider the practice of selecting averaging periods after they have occurred is an effective mechanism for achieving the allowed rate of return objective. This is because choosing the averaging period in advance is important for obtaining an unbiased estimate. By bias, here we mean that at the time the averaging period is selected, it is not known with certainty whether it will result in a higher or lower estimate than the estimate from a different potential averaging period.*
>
> *If an averaging period is chosen after the nominated period has occurred, the knowledge of the return on debt at any past point of time may influence the choice. It would not matter if the period were chosen by the AER, the service provider, a user or consumer, the Australian Competition Tribunal or another stakeholder. We made this clear in the Guideline when we specified the importance of determining an averaging period in advance. In particular, we specified that if a service provider could select an averaging period by looking at historical yields, it could introduce an upwards bias."*

In the above extract from the Draft Decision, the AER misunderstands the relevance of the concept of bias in connection with the decision that it is required to make under the NGL and the NGR. An estimate of the return on debt will be "unbiased" in a relevant sense when it has a value that is commensurate with expected efficient debt financing costs over the relevant AA period.

To the extent the AER's identification of the efficient financing costs of a BEE is correct, it is common ground that the outcome of the efficient financing practice adopted by that entity is that it will face a trailing average DRP over the AA period. In the prevailing market conditions, the adoption of a methodology to estimate the return on debt that does not calculate the DRP component using a trailing average approach results in a return on debt below that which is commensurate with expected efficient financing costs. This much is accepted by the AER as it notes in respect of its transition:[78]

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77 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-192.
78 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-191.

> *"Whether the allowed DRP matches, or is higher or lower than, a benchmark efficient entity's financing cashflows with respect to the DRP component depends on whether the prevailing and historical average DRP is higher, lower, or around the same level as each other."*

In the case of the Final Decision to be made for AGN, the Draft Decision notes that prevailing interest rates are currently lower than the historical average of interest rates over the past 10 years,[79] and therefore the AER's transition results in a DRP that is lower than the AER's BEE's financing cashflows. The AER goes on to state in its Draft Decision that the fact that prevailing interest rates are lower than the historical average of interest rates over the past 10 years is simply a consequence of the particular timing of the decision,[80] suggesting that the issue of under-compensation relative to efficient financing costs is an irrelevant matter. However, not only is the AER able to deal with that issue under the NGR and the NGL, it is in fact required to deal with it in making its decision; the NGR provide that compensation of the provider for efficient financing costs is determinative in selecting the methodology for estimation of the return on debt.

The AER's decision must be in accordance with the NGL, and more specifically, with the NGO and the RPP.[81] The RPP are consistent with and designed to promote the NGO.[82] In discussing the RPP, the Tribunal has previously noted the importance of providing for the recovery of at least efficient costs in the context of efficiency objectives.[83]

> *"It is well accepted in the literature of regulatory economics and in regulatory practice that all these efficiency objectives [efficient investment, efficient provision of services, efficient use of system] are in principle met by setting prices for services that allow the recovery of efficient costs, including the cost of capital commensurate with the riskiness of the investment in the assets (infrastructure or 'system', as the term is used in the NEL) used to provide services.*
>
> *It might be asked why the NEL principles require that the regulated NSP be provided with the opportunity to recover at least its efficient costs. Why 'at least'? The issue of opportunity is critical to the answer. The regulatory framework does not guarantee recovery of costs, efficient or otherwise. Many events and circumstances, all characterised by various uncertainties, intervene between the ex ante regulatory setting of prices and the ex post assessment of whether costs were recovered. But if, as it were, the dice are loaded against the NSP at the outset by the regulator not providing the opportunity for it to recover its efficient costs (eg, by making insufficient provision for its operating costs or its cost of capital), then the NSP will not have the incentives to achieve the efficiency objectives, the achievement of which is the purpose of the regulatory regime.*
>
> *Thus, given that the regulatory setting of prices is determined prior to ascertaining the actual operating environment that will prevail during the regulatory control period, the regulatory framework may be said to err on the side of allowing at least the recovery of efficient costs. This is in the context of no adjustment generally being made after the event for changed circumstances."*

Given the benchmark efficient financing practices the AER considers its BEE would have adopted, which would result in the BEE facing a trailing average DRP over the 2016/17 to 2020/21 AA period, the only basis upon which the AER could permissibly calculate the DRP component of the return on debt otherwise than using a trailing average approach is if the use of that approach would generate a return on debt that is inappropriate, in the sense of being too high or too low having regard to the period in which it is to be applied (being the 2016/17 to 2020/21 AA period).

As noted in the extract from the Draft Decision above, the AER uses the concept of avoiding 'bias' as meaning that at the time the averaging period is selected, it is not known with certainty whether it will result

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79 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-148 to 149.
80 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-149.
81 NGL, s28.
82 *Application by EnergyAustralia and Others* [2009] ACompT 8, [75].
83 *Application by EnergyAustralia and Others* [2009] ACompT 8, [76]-[78].

in a higher or lower estimate than the estimate from a different potential averaging period.[84] However, the relevant task under the NGR is to estimate the return on debt that contributes to the ARORO. Use of the trailing average approach to estimate the DRP component will not introduce bias because the use of that approach is required by the NGR, as opposed to any foreknowledge of the outcome of selecting that approach on the part of the AER or the service provider. Further, the cost of debt under existing facilities – i.e. facilities on foot for some time – is a known quantity. The fact that it is known does not give rise to 'bias' in any relevant sense.

In any case, to the extent there is foreknowledge of the outcome of selecting the trailing average approach to estimate the DRP component, there is equal foreknowledge of the outcome of selecting the AER's approach. That is, the comparative result of selecting between different approaches to estimating the DRP component was known to (or at least to be expected by) the service provider and the AER at the time the first debt averaging period for the 2016/17 to 2020/21 AA period was selected, despite the fact that that averaging period was yet to occur, because prevailing interest rates are currently lower than the historical average of interest rates over the past 10 years, as is acknowledged by the AER in the Draft Decision.[85] The only thing that is unknown is the precise amount by which the AER approach to estimating the DRP component will deliver a lower return on debt than the trailing average approach to estimating the DRP. As such, the foreknowledge of relevance to the AER's concern about bias in choosing an approach to estimation of the DRP component, being as to the outcome of selecting between different methods for use in estimating the DRP component, cannot be remedied by applying the AER's transition to the DRP component.

However, it is in fact the application of the AER's transition approach that results in a biased (in the relevant sense) estimate of the return on debt. Given the AER's assumptions as to a BEE's efficient financing practices in and prior to the 2011/12 to 2015/16 AA period, the BEE will face a cost of debt reflecting a 10-year trailing average DRP component. The AER's approach therefore produces a biased estimate of the return on debt insofar as it undercompensates the benchmark efficient operator. It is in this context that the concept of "bias" has any relevance, not in the sense that the AER has used that concept. To use the words of the Tribunal above, the approach of the AER in the Draft Decision is to "*load the dice*" against AGN at the outset by not providing the opportunity for AGN to recover its efficient costs by making insufficient provision for the return on debt.

The hybrid transition avoids the bias associated with the AER's transition. As noted in the Draft Decision, the hybrid transition:[86]

> *"…provides a good match between the allowed return on debt and a benchmark efficient entity's financing costs over the period it takes a benchmark efficient entity to transition its financing practices to the trailing average approach."*

Once it is accepted that a trailing average approach to the DRP should be taken, there also can be no concerns as to bias or opportunistic behaviour as to selection of averaging periods in light of AGN's submission that the trailing average DRP is calculated by reference to full calendar year averaging periods.

Relevant to the issue of bias, is the AER's criticism that the hybrid transition (AER Option 3) and immediate adoption of the trailing average approach (AER Option 4) are "*backwards looking*".[87] However, contrary to the suggestion of the AER that starting with the on-the-day approach and transitioning to the trailing average approach (AER Option 2) is forward-looking in that each addition to the average occurs at the prevailing rate in an averaging period nominated in advance,[88] a trailing average cost of debt is forward-looking because it is the cost of debt that an entity, which had historically adopted a fixed-rate staggered approach to its debt portfolio, would face now and in the future. An entity in a competitive market would have facilities currently on foot at different interest rates (reflecting the different years in which they were entered into). For example, a service provider might have a facility at 7%, a facility at 8%, a facility at 9%, a facility at 6.5%, and so on.

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84 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-192.
85 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-149.
86 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-166.
87 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-193.
88 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-193.

The interest payable on these facilities constitutes current interest costs that will continue to be applicable in subsequent years in the AA period (until those facilities expire). These interest costs are in no sense "backwards looking". The trailing average approach calculates the cost of debt now, and as it will change over the five year AA period. It is not possible to know at present precisely what the future costs of debt will be—they will be determined in future regulatory years. This is a forward-looking approach.

In regulatory terms, a "backwards-looking" approach is one that involves the regulator looking back over previous regulatory years to see whether the regulatory allowance matched the actual costs of the regulated entity. This is what the AER does in the Draft Decision in appearing to rely on Dr Lally's conclusion that there are some "*accumulated differences*" between the return on debt estimate and the actual return on debt of a BEE arising from prior periods (this issue is discussed further below).[89] Therefore, it is the AER that uses a backwards-looking analysis by seeking to determine if there was some "windfall gain" arising from the previous AA period and then using that to reduce the forward-looking return on debt calculated over the forthcoming period.

The ARORO in NGR 87(3) is that the rate of return for a service provider is to be "*commensurate with the efficient financing costs of a BEE"*. A methodology that estimates the return on debt using a trailing average approach will provide for a return that is commensurate with the financing costs that a BEE will face over the 2016/17 to 2020/21 AA period. It is forward-looking in precisely the manner that is relevant under NGR 87(3).

The AER's debt transition is not forward-looking in the relevant sense required by NGR 87(3). Even in respect of the AER's own BEE, being one that would have entered into swaps to hedge the base rate component of its cost of debt, the AER's transition does not provide for a return on debt that is commensurate with the costs that entity will face over an AA period. This is because this entity would face a trailing average of the DRP component of its cost of debt. The AER's transition is designed to provide a lower allowance in respect of the notional DRP component of the cost of debt over the 2016/17 to 2020/21 AA period (and beyond). There are two fundamental difficulties with the AER's approach, which are discussed below under the "NPV= 0" topic. These are:

- Firstly, the AER considers that its approach is authorised by the NPV=0 approach to account for assumed positive "accumulated differences" arising from previous AA periods. However, the regulatory regime does not permit "true-ups" of this kind based on an ex post review of the regulatory allowance provided for a particular component of a building block and the costs that were actually incurred by the service provider in respect of that component.

- Secondly, there is no reasoned basis upon which a view can be formed as to whether there has been over-recovery and if so, the quantum of this over-recovery.[90]

NPV = 0

The second drawback that the AER concluded arises under a hybrid transition is that it can create a mismatch between the allowed return on debt and the efficient financing costs of a BEE over the life of its assets. The AER stated:[91]

> *"Transitioning from the on-the-day approach using the hybrid transition can create a mismatch between the allowed return on debt and the efficient financing costs of a benchmark efficient entity over the life of its assets. The change in the regulatory regime can therefore create windfall gains or losses to service providers or consumers. Windfall gains or losses do not result from a service provider's efficient or inefficient decisions. In effect, they are a side effect*

89 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-182.

90 See Draft Decision, p3-184, where the AER states: "*…due to the unavailability of reliable older data, we are unable to draw reliable conclusions about accumulated windfall gains or losses in preceding access arrangement periods*". Also: Chairmont, *Financing Practices Under Regulation: Past and Transitional*, 13 October 2015, p38, where Chairmont says: "*…it is concluded that there is insufficient history of relevant BBB bond data to measure over and under compensation for an adequate time period to come to any definitive conclusion about the net result over the life of energy assets*".

91 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-166.

of changing the methodology for estimating the return on debt at a particular point in time. They should be avoided, so that economic regulatory decisions deliver outcomes based on efficiency considerations, rather than timing or chance."

In the Draft Decision the AER notes that the NGL requires the AER to take into account that a regulated service provider should be provided with a reasonable opportunity to recover at least its efficient costs.[92] Based on advice from Dr Lally, the AER considers that the principle that a service provider be provided with a reasonable opportunity to recover at least its efficient costs is equivalent to the NPV principle.[93] The AER explains that the NPV principle is that the expected present value of a BEE's regulated revenue should reflect the expected present value of its expenditure, plus or minus any efficiency incentive rewards or penalties.[94]

In his advice to the AER, Dr Lally stated that the requirement in the NGR that the return on debt be commensurate with the efficient financing costs of a BEE is "*not sufficiently precise to be readily implemented and therefore requires formalizing*".[95] However, it is unclear why Dr Lally considers the requirement as stated in the NGR to be imprecise. The requirement is simply stated and does not require any overlay or 'formalisation' in order for it to be implemented. What is required is to ascertain efficient financing costs (which as stated above are the costs that would be expected in a workably competitive market or, if that position is incorrect, the costs that would be incurred having regard to the AER's assumptions about the financing practices of a BEE under the on-the-day approach to estimating the return on debt) and to design a methodology for estimating the return on debt which, insofar as possible, matches those costs.

The AER speaks very generally about NPV "*over the life of the assets*", but does not actually identify what life and what assets, and how any particular debt instrument relates to the life of any particular asset. The relevant asset here is the capital base of the regulated entity. The capital base is made up of thousands of assets, with lives ranging from five or fewer years to 60 years. The regulatory regime, as applied by the AER, assumes that for a benchmark entity 60% of the capital base is funded by debt. Debt is not raised in respect of particular assets. Debt instruments do not attach to specific assets. Rather, in respect of the BEE it is assumed that there is simply a portion of the capital base that is funded by debt and, in accordance with the debt/equity ratio assumed under the regulatory regime, the BEE takes out debt instruments to fund the relevant proportion of its capital base. In this way it is nonsensical to talk about NPV over the life of the assets. To the extent there is a relevant "asset" in a NPV = 0 context, it is the capital base, the life of which, for all practical purposes, is indeterminate and indefinite.

The NPV principle cannot be used to override the requirements in the NGL and the NGR, in particular:

- the RPP (NGL, s24(2))—which require that a service provider should be provided with a reasonable opportunity to recover at least the efficient costs it incurs in providing reference services; and

- the ARORO (NGR 87(3))—which requires that the rate of return for a service provider is to be commensurate with efficient financing costs.

These requirements apply to the decision that the AER is required to make for the 2016/17 to 2020/21 AA period. That is, the service provider is to be provided with a reasonable opportunity to recover at least the efficient costs it incurs in providing reference services in the 2016/17 to 2020/21 AA period and the rate of return is to be commensurate with efficient financing costs the service provider will incur in the 2016/17 to 2020/21 AA period. As set out below, this follows as a matter of statutory construction.

Section 28(1) of the NGL requires the AER to perform or exercise its economic regulatory functions and powers in a manner that will or is likely to contribute to the achievement of the NGO. Section 28(2) requires the AER to take into account the RPP when exercising a discretion in approving or making those parts of an access arrangement relating to a reference tariff. The AER is bound to do these things in respect of each

92 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-174.
93 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-175.
94 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-174 to 75.
95 M Lally, *Review of Submissions on the Cost of Debt*, April 2015, p19.

individual designated reviewable regulatory decision it makes. That is, section 28 of the NGL does not require the AER to make determinations for a service provider over some indefinite period of time that collectively or overall contribute to the achievement of the NGO, and take into account the RPP. Such an interpretation would be absurd, including because it would purport to authorise the AER to provide a service provider with less than efficient costs in some periods, and more than efficient costs in other periods, which is clearly inconsistent with the regulatory framework established by the NGL and the NGR. Yet this is how the AER seeks to apply the NPV=0 principle in applying its transition to the DRP component of the return on debt.

Various provisions in the NGR also make clear that the decision the AER is required to make is in respect of an AA period and that the forecasts and estimates used to determine allowed revenues are based on the best estimate of forecast costs over the AA period. For example, the provisions relating to total revenue refer to determining the annual revenue required for each regulatory year of the AA period.[96] Specifically in connection with the rate of return, NGR 87(1) refers to the return on capital for each regulatory year being calculated by applying a rate of return for that regulatory year which is determined in accordance with NGR 87. This last provision indicates that the task is to determine a rate of return for each regulatory year of the AA period that satisfies the requirements of the NGR (including the ARORO), not determining a rate of return that satisfies those requirements over some other, unspecified, period.

In the Draft Decision, the AER concludes that its transition provides a BEE with a reasonable opportunity to recover efficient financing costs over the life of its assets, whereas the hybrid transition does not. It is unclear from the Draft Decision precisely what finding underpins this conclusion.[97] In particular:

- the AER explicitly concludes that it has "*not relied on the historical balance of over or under recoveries*" in making its decision[98]—which suggests that this conclusion does not rest upon a finding as to the existence of any accumulated windfall gains or losses; and

- yet, at the same time, under the heading '*Fairness of returns in expectation*' the AER also appears to rely on analysis conducted by Dr Lally which Dr Lally claimed demonstrated that the AER's transition "*allows the regulatory regime to account for accumulated differences between the return on debt estimate and the actual return on debt of a benchmark efficient entity*".[99]

AGN submits that it is impermissible for the AER to take into account differences between the allowed return on debt and the actual return on debt faced by a benchmark service provider in previous AA periods in calculating the return on debt for the 2016/17 to 2020/21 AA period (for the reasons discussed below). However, even assuming it was permissible for the AER to do so, in order for the AER to find that the application of its transition to the DRP component of the return on debt provides a BEE with a reasonable opportunity to recover efficient financing costs over the life of its assets, the AER must find that the benchmark service provider enters into the 2016/17 to 2020/21 AA period with a positive accumulated difference between the allowed return on debt and the actual return on debt faced by the benchmark service provider in previous AA periods. The AER has not done this.

The AER states that it can conclude with a "*reasonably high degree of confidence*" that the BEE would have been overcompensated over the previous AA period.[100] However, the material referred to by the AER does not support such a conclusion for AGN.

The AER ultimately concedes that it is "*unable to draw reliable conclusions about accumulated windfall gains or losses in preceding access arrangement periods*".[101] This finding is supported by Chairmont's October 2015 report.[102] Therefore, in circumstances where it is common ground that the application of the AER's transition to the DRP component of the return on debt will result in the AER's BEE being under-

96 NGR 76.

97 This conclusion is set out in AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-18 in Table 3-23.

98 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-185.

99 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-181 to 182.

100 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-183.

101 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-184.

102 Chairmont, *Financing Practices Under Regulation: Past and Transitional*, October 2015, pp38-39.

compensated in the 2016/17 to 2020/21 AA period, it cannot be concluded that the AER's transition provides a BEE with a reasonable opportunity to recover efficient financing costs over the life of its assets. Assuming any such "look back" was permissible, such a conclusion could only be drawn if the benchmark service provider has "accumulated" gains (i.e. has been "overcompensated" for the return on debt in previous AA periods) at the commencement of the 2016/17 to 2020/21 AA period and that the gains over prior periods are precisely offset by the anticipated shortfall in the return on debt during the 2016/17 to 2020/21 AA period.

In any case, as a matter of construction, the statutory regime does not permit the AER to seek to 'clawback' differences between the allowed return on debt and the actual return on debt faced by a benchmark service provider in a prior AA period. A fundamental principle of the regulatory regime is that it embodies incentive regulation. Under incentive regulation, regulated revenues are set ex-ante and firms have an incentive to reduce costs to outperform regulated revenues such that over time regulated revenues are expected to converge to the efficient level. Once the regulatory allowance has been set, ex post adjustments are not made to that regulatory allowance based on differences between forecasts and actual costs, other than for the impact of inflation.

Consistent with the incentive regulation basis of the regime established by the NGR, the task of setting a regulatory allowance for an AA period prescribed by the NGR is a forward-looking one. Pursuant to the building block approach set out in NGR 76, there are only a few specified matters that may have occurred in a prior AA period that have any relevance to the calculation of the regulatory allowance in the subsequent AA period. There are two discrete matters:

- the value of the capital base; and
- revenue increments and decrements resulting from the operation of any relevant incentive mechanism in the previous AA period.[103]

With the exception of these two matters, the regulatory framework does not operate in a manner that looks back at what has happened in a previous AA period in order to calculate the annual revenue requirement for a service provider for each regulatory year of a period in an attempt to capture some prior difference between allowable revenues and costs. Rather, the regulatory framework is designed and operated in such a way that once regulated allowances are set, they are taken to be the efficient allowance for the BEE and there can be no retrospective adjustments for departures from this allowance.

As regulated entities could not match the DRP component of their debt costs to the regulatory allowance for the return on debt under the on-the-day approach, it was inevitable that there would be a mismatch between any debt costs incurred by a benchmark regulated entity and the return on debt allowance for that entity. However, that was simply a consequence of the regulatory approach—the allowance was the allowance and regulated entities were required to manage their operations in accordance with that allowance. This much is accepted by the AER:[104]

> *"Incentive based regulation uses the combination of financial rewards and penalties to promote efficient behaviour. In particular, it means that where a service provider:*
>
> - *matches the efficient regulatory benchmark—it recovers its efficient costs. We consider this would be the outcome for the benchmark efficient entity. As it operates efficiently, it would recover its efficient costs.*
> - *does not match the regulatory benchmark—it keeps the financial benefits or financial detriments that flow from its actions. An example of this would be where a service provider is able to source debt at rates cheaper than the allowed return on debt it is able to keep the difference.*

[103] NGR 76.

[104] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-171 to 172.

- *adopts a risk position which is either higher or lower risk than that embedded in the regulatory process—it keeps the financial benefits or wears the financial detriments that flow from its actions."*

The NGR require that the rate of return for a AA period is commensurate with the efficient financing costs of a BEE. As noted by Professor Gray:[105]

> *"The new Rules state that for each determination the allowed rate of return must be commensurate with the efficient financing costs of a benchmark efficient entity. The Rules do not provide for an exception in cases where the regulator considers that it should set the allowed return to be different from the efficient financing costs of a benchmark efficient entity in order to square up the regulator's assessment of any windfall gains or losses from prior regulatory periods."*

Professor Gray notes the following further problems with the AER's decision to seek to erode the perceived windfall gain:

- The amount of any gain to be eroded or 'clawed back' will depend on how many prior AA periods are included in the regulator's mental accounting. It is possible that any perceived windfall gain that may have been accrued in the prior AA period has already been squared up by shortfalls in earlier AA periods preceding the prior AA period.[106]

- The perceived windfall gains may have been balanced out by other features of the prior regulatory determination. In periods where investors are requiring higher risk premiums on debt investments in the benchmark firm, for example, they will also be requiring higher equity risk premiums in the same benchmark firm. However, the AER's approach has been to use an essentially fixed MRP in its allowed return on equity.[107]

The imposition of the AER's transition is also at odds with the 2012 Rule Amendment, which is directed at better matching the regulated return on debt (and the overall rate of return) with costs that would be incurred pursuant to efficient financing practices. As noted by the AER's consultants, with respect to the DRP component of the return on debt, there is no mismatch between the cost incurred by the benchmark efficient firm and that allowed by a trailing average approach after the regime change. As such, no transitional method appears to be warranted and, if one was used, Lally notes, it would introduce a mismatch that would not otherwise arise.[108]

In summary, the AER's NPV=0 justification:

- is inconsistent with the ARORO which, as noted above, requires that the allowed rate of return for each regulatory year reflects the efficient financing costs of a BEE for that year;

- is inconsistent with the NGO and the RPP which demand that a service provider be provided with a reasonable opportunity to recover at least the efficient costs incurred in providing reference services; and

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105 SFG, *Return on Debt Transition Arrangements under the NGR and NER: Report for Jemena Gas Networks, Jemena Electricity Networks, Citipower, Powercor and United Energy*, 27 February 2015, p4 (http://www.aer.gov.au/system/files/SA%20Power%20Networks%20-%20M.23_PUBLIC_SFG_%20Return%20on%20debt%20transition%20arrangements%20under%20the%20NGR%20and%20NER.pdf).

106 SFG, *Return on Debt Transition Arrangements under the NGR and NER: Report for Jemena Gas Networks, Jemena Electricity Networks, Citipower, Powercor and United Energy*, 27 February 2015, p26.

107 SFG, *Return on Debt Transition Arrangements under the NGR and NER: Report for Jemena Gas Networks, Jemena Electricity Networks, Citipower, Powercor and United Energy*, 27 February 2015, pp25–26.

108 Lally, *Transitional Arrangements for the Cost of Debt*, 24 November 2014, p7.

- introduces regulatory risk and is inconsistent with incentive-based regulation in that it introduces an ex-post adjustment mechanism after a regulated firm has benefited from operating in a way that the regulator itself considers to be efficient.

In any event, there is no evidence that adopting a hybrid transition would violate the NPV=0 principle, as claimed by the AER. This is because, as acknowledged by the AER and as advised by Chairmont, it cannot be ascertained with any certainty the extent to which there are accumulated windfall gains or losses from prior periods.

In short, imposing a transition for the DRP component of the return on debt where that component cannot be hedged under the on-the-day approach is inconsistent with the NGO, the RPP and the requirements of the NGR. In particular, it will not provide a BEE with a return on debt that is commensurate with efficient financing costs or provide a reasonable opportunity to recover at least the efficient costs the BEE incurs in providing reference services.

1.5.3.4 Other matters relied on by the AER in support of its transition

The AER finds that its transition has two further positive attributes, in addition to providing a service provider with a reasonable opportunity to recover its efficient financing costs over the life of its assets and being unbiased. These are that:

- the transition maintains the outcomes of the service provider's past financing decisions, consistent with the principles of incentive regulation; and

- avoids practical problems with the use of historical data "*as estimating the return on debt during the global financial crisis is a difficult and contentious exercise*".[109]

Dealing with the second point first, the AER itself notes that it is satisfied that "*this is a relatively minor issue*".[110] The only issue with respect to historical data needed to estimate the trailing average approach relates to the DRP component of the return on debt, and only relates to the selection of which data source to use, as opposed to the data not being available at all.[111] The AER's consultant Chairmont does not note any particular difficulty with the use of historical data to estimate a return on debt using the trailing average approach and states that it is likely that a reasonable estimate could be determined.[112]

The AER's finding that maintaining the on-the-day approach is consistent with incentive regulation is illogical. The AER states that effective ex-ante incentive regulation relies on service providers understanding and accepting the financial consequences of their decisions at the time they make their decision.[113] However, the AER acknowledges that service providers have limited control over the DRP component of the cost of debt. As such, as a general matter, there is no relevant incentive with respect to this component that service providers could be said to have '*understood and accepted the financial consequences of their decisions*'. Therefore, to the extent maintenance of outcomes of past financing decisions consistent with principles of incentive regulation is relevant, it does not support either the continuation of the on-the-day approach or the AER's transition. It does however support the hybrid transition because, as noted by the AER, application of the hybrid transition would maintain the incentive that service providers should reduce risks that are within their control.[114]

1.5.3.5 Conclusion

For the above reasons, AGN considers that the trailing average approach should be implemented immediately, with no transition.

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109 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-164.
110 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-164.
111 Lally, *Transitional Arrangements for the Cost of Debt*, 24 November 2014, p15.
112 Chairmont, *Cost of Debt: Transitional Analysis*, April 2015, p47.
113 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-173.
114 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-173.

Alternatively, if the AER's approach of estimating efficient financing costs by reference to the financing practices that would emerge under regulation were correct, the appropriate approach would be to adopt a hybrid form of transition where only the hedged base rate component of the return on debt is subject to a transition. This is because the AER has concluded that under the on-the-day approach, an efficient financing practice would have been to engage in hedging of the base rate. By contrast, the AER has conceded that the DRP component cannot be—and could not have been in the past—hedged, with the result that there is no reason for a transition to be applied to it.

If a transition is applied to the base rate, then it is necessary to consider to what degree hedging would be efficient. A transition can only apply to the base rate component to the extent that the BEE used hedging to match the previous on-the-day approach to setting the allowed return on debt, and one cannot simply assume that 100% of that component was hedged under that approach without evidence to support it.

The hybrid transition proposed in AGN's Initial AA Proposal was based on an assumption that 100% of the base rate was hedged. However, AGN also noted in the Initial AA Proposal that AGN this was a conservative approach and AGN would give further consideration to the possibility of a transition based on a lower hedging rate.

The evidence demonstrates that the efficient level of hedging under the previous on-the-day approach was significantly less than 100%. Empirical analysis by CEG demonstrates a hedging ratio of approximately one third would have minimised interest rate risk.[115] In a further expert report accompanying this submission, CEG considers and responds to criticisms made by Chairmont and Professor Lally of this analysis. Following this review of the Chairmont and Lally reports, CEG's view as to the optimal hedging ratio under the previous on-the-day approach is unchanged.[116]

Therefore, if a hybrid transition is to be adopted (i.e. if the AER's view of efficient financing costs were correct), the transition should only apply to one third of the base rate, reflecting the extent to which a BEE would have been expected to hedge the base rate component.

AGN refers to and repeats its cost of debt position regarding the three approaches referred to in this Revised AA Proposal, as set out at the end of section 1.2 above.

1.5.4 Term

Empirical evidence continues to support a benchmark term of debt of 10 years. This includes evidence for Australian energy network businesses, and for businesses operating in other sectors and jurisdictions facing a similar degree of risk.[117]

AGN does not agree with the statement in the Draft Decision that a 10 year term assumption is more likely to overstate than understate the debt term (and therefore, the efficient financing costs) of a BEE.[118] A 10 year term assumption properly reflects the efficient financing practices of a BEE facing a similar degree of risk to that faced by AGN in the provision of reference services.

1.5.5 Estimation of the prevailing return on debt for the placeholder/first measurement period

Under AGN's primary "no transition" approach, the return on debt for the first regulatory year of the AA period (2016/17) is calculated as the sum of:

- the trailing average base rate, being the average of the 10-year swap rates over the years 2006/07 to 2015/16 measured over BRAP1;

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115 CEG, *Efficient Use of Interest Rate Swaps to Manage Interest Rate Risk*, June 2015, Attachment 10.23 to AGN's Initial AA Proposal.

116 CEG, *Critique of the AER's approach to transition*, January 2016 (Attachment 10.28 to this Revised AA Proposal)

117 PwC, *Energy Networks Association: Benchmark term of debt assumption*, June 2013 (http://www.aer.gov.au/system/files/Report%2020%20-%20Benchmark%20Term%20of%20Debt%20%28Final%29%20-%2027%20June.pdf). Based on a sample including Australian, UK and US businesses operating in the energy and water sectors, PwC concluded that such businesses issued debt with a weighted average term in the range of 10 to 21 years.

118 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-212.

- the trailing average DRP, being the historical average DRP over the years 2006/07 to 2015/16 measured over DRPAP1; and

- the new issue premium of 0.27%.

Under the alternative "hybrid transition" approach, assuming hedging of 33.3% of the base rate, the return on debt for the first regulatory year of the AA period (2016/17) is calculated as the sum of:

- the base rate, being a weighted average of:

  – the trailing average base rate, being the average of the 10-year swap rates over the years 2006/07 to 2015/16 measured over BRAP1 (being the averaging period nominated for the "no transition" approach), weighted as to 66.7%; and

  – the average of one-to-10 year swap rates in BRAP1 (being the averaging period nominated for the "hybrid transition" approach), weighted as to 33.3%;

- the trailing average DRP, being the historical average DRP over the years 2006/07 to 2015/16 measured over DRPAP1;

- swap transaction costs of 0.038%; and

- the new issue premium of 0.27%.

Under the alternative "hybrid transition" approach, assuming hedging of 100% of the base rate, the return on debt for the first regulatory year of the AA period (2016/17) is calculated as the sum of:

- the base rate, being the average of one-to-10 year swap rates in BRAP1;

- the trailing average DRP, being the historical average DRP over the years 2006/07 to 2015/16 measured over DRPAP1; and

- swap transaction costs of 0.115%; and

- the new issue premium of 0.27%.

AGN refers to and repeats its cost of debt position regarding the three approaches referred to in this Revised AA Proposal, as set out at the end of section 1.2 above.

In each case, the trailing average DRP is calculated:

- in respect of the years 2006/07 to 2013/14, as the average of Bloomberg and RBA estimates extrapolated to ten years using the AER methodology (as set out in Table 8 of CEG's latest report[119]); and

- in respect of 2014/15 and 2015/16, by undertaking testing using the approach set out in Section 5 of, and Appendix A to, the June 2015 CEG report[120] (calculating the sum of squared errors from observed bond data of difference in third-party yield estimates extrapolated to ten years using AER and SA Power Networks extrapolation methodologies) and selecting the data source (or sources) and extrapolation method (or methods) that provide the best fit to the data for the relevant regulatory year.[121]

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119 CEG, *Curve testing and selecting averaging periods*, January 2016 (Attachment 10.27 to this Revised AA Proposal).

120 CEG, *The hybrid method for the transition to the trailing average rate of return on debt*, June 2015 (Attachment 10.22 to AGN's Initial AA Proposal).

121 The results of this testing for 2014/15 are set out in CEG, *Curve testing and selecting averaging periods*, January 2016, section 2.3 (Attachment 10.27 to this Revised AA Proposal).

AGN maintains (as proposed in its Initial AA Proposal) that the appropriate approach (that complies with the ARORO and the NGO) to selecting data sources and the extrapolation methodologies used to estimate the DRP is the testing methodology developed by CEG. More recent analysis by CEG demonstrates that results from the various potential data sources (including RBA, Bloomberg and Reuters) differ over time, and those data sources have varying strengths (and weaknesses) when assessed against criteria of:

- the dataset that best matches the characteristics of the BEE;
- a sufficiently large dataset;
- data derived using a transparent (and accurate and robust) methodology;
- regular publication by an independent, reputable organisation; and
- a track record of accuracy.[122]

As a result, AGN maintains that it is not appropriate (as the AER has done in the Draft Decision) to determine the DRP by reference to a simple average of the Bloomberg and RBA data curves, but rather that testing should be undertaken annually to find the most accurate data source (and extrapolation method) each year.

As AGN's nominated averaging periods for the 2016/17 regulatory year have either not yet occurred or are not yet complete, CEG has calculated the indicative return on debt for the 2016/17 year under each of the above approaches (see Table 2 below):

- using a placeholder averaging period of 1 July to 30 October 2015 for the base rate (under the no transition approach); and
- using a placeholder averaging period of 1 to 30 October 2015 for the base rate (under the hybrid transition approaches);
- using the historical average DRP for 2014/15 as a placeholder for the average DRP for 2015/16 (under all approaches),

(with each to be updated following the completion of AGN's nominated averaging periods).

TABLE 2: INDICATIVE RETURN ON DEBT FOR 2016/17

Transition method	Base rate	DRP	Swap transaction costs	New issue premium	Total return on return (annualised)[123]
No transition (immediate application of trailing average method)	5.04%[124]	2.47%[125]	-	0.27%	7.93%
Hybrid transition, assuming an optimal hedging ratio of 33.3%	4.18%	2.47%	0.04%	0.27%	7.08%
Hybrid transition, assuming 100% hedging	2.47%[126]	2.47%	0.12%	0.27%	5.39%

122 CEG, *Criteria for assessing fair value curves*, January 2016 (Attachment 10.29 to this Revised AA Proposal).
123 CEG, *Curve testing and selecting averaging periods*, January 2016, Table 6 (Attachment 10.27 to this Revised AA Proposal).
124 Average of the 10 year swap rates in Table 8 of CEG, *Curve testing and selecting averaging periods*, January 2016 (Attachment 10.27 to this Revised AA Proposal).
125 Average of the DRPs in Table 8 of CEG, *Curve testing and selecting averaging periods*, January 2016 (Attachment 10.27 to this Revised AA Proposal) – averages of RBA and Bloomberg curves for 2006/07 to 2013/14, CEG curve selection for 2014/15 and placeholder for 2014/15.
126 Average of the one-to-10 year swap rates in Table 7 of CEG, *Curve testing and selecting averaging periods*, January 2016 (Attachment 10.27 to this Revised AA Proposal).

1.5.6 Annual updating of the return on debt

Under AGN's primary "no transition" approach, the return on debt for subsequent years of the AA period is to be updated annually and calculated as the sum of:

- the trailing average base rate, being:
  - in 2017/18, 90% weight given to the average of the 10-year swap rates for the nine years ending 2015/16 (measured over BRAP1) and 10% weight given to the average of the 10-year swap rates in BRAP2;
  - in 2018/19, 80% weight given to the average of the 10-year swap rate for the eight years ending 2015/16 (measured over BRAP1), 10% weight given to the average of the 10-year swap rates in BRAP2 and 10% weight given to the average of the 10-year swap rates in BRAP3;
  - in 2019/20, 70% weight given to the average of the 10-year swap rate for the seven years ending 2015/16 (measured over BRAP1), 10% weight given to the average of the 10-year swap rates in BRAP2, 10% weight given to the average of the 10-year swap rates in BRAP3 and 10% weight given to the average of the 10-year swap rates in BRAP4; and
  - in 2020/21, 60% weight given to the average of the 10-year swap rate for the six years ending 2015/16 (measured over BRAP1), 10% weight given to the average of the 10-year swap rates in BRAP2, 10% weight given to the average of the 10-year swap rates in BRAP3, 10% weight given to the average of the 10-year swap rates in BRAP4 and 10% weight given to the average of the 10-year swap rates in BRAP5;
- the trailing average DRP, being:
  - in 2017/18, 90% weight given to the historical average DRP for the nine years ending 2015/16 (measured over DRPAP1) and 10% weight given to the average DRP over DRPAP2;
  - in 2018/19, 80% weight given to the historical average DRP for the eight years ending 2015/16 (measured over DRPAP1), 10% weight given to the average DRP over DRPAP2 and 10% weight given to the average DRP over DRPAP3;
  - in 2019/20, 70% weight given to the historical average DRP for the seven years ending 2015/16 (measured over DRPAP1), 10% weight given to the average DRP over DRPAP2, 10% weight given to the average DRP over DRPAP3 and 10% weight given to the average DRP over DRPAP4; and
  - in 2020/21, 60% weight given to the historical average DRP for the six years ending 2015/16 (measured over DRPAP1), 10% weight given to the average DRP over DRPAP2, 10% weight given to the average DRP over DRPAP3, 10% weight given to the average DRP over DRPAP4 and 10% weight given to the average DRP over DRPAP5; and
- the new issue premium of 0.27%.

Under the alternative "hybrid transition" approach, assuming hedging of 33.3% of the base rate, the return on debt for each subsequent year of the AA period is to be updated annually and calculated as the sum of:

- the base rate, being a weighted average of the base rate for the regulatory year as determined under the "no transition" approach set out above (weighted as to 66.7%) and as determined under the "hybrid transition" approach set out below (weighted as to 33.3%);
- the trailing average DRP, calculated in the same manner as under the "no transition" approach (as set out above);
- swap transaction costs of:

  - 0.034% in 2017/18;
  - 0.031% in 2018/19;
  - 0.027% in 2019/20; and
  - 0.023% in 2020/21; and
- the new issue premium of 0.27%.

Under the alternative "hybrid transition" approach, assuming hedging of 100% of the base rate, the return on debt for subsequent years of the AA period is to be updated annually and calculated as the sum of:

- the base rate, being:
  - in 2017/18, 90% weight given to the average of two-to-10 year swap rates in BRAP1 and 10% weight given to the average of the 10-year swap rates in BRAP2;
  - in 2018/19, 80% weight given to the average of three-to-10 year swap rates in BRAP1, 10% weight given to the average of the 10-year swap rates in BRAP2 and 10% weight given to the average of the 10-year swap rates in BRAP3;
  - in 2019/20, 70% weight given to the average of three-to-10 year swap rates in BRAP1, 10% weight given to the average of the 10-year swap rates in BRAP2, 10% weight given to the average of the 10-year swap rates in BRAP3 and 10% weight given to the average of the 10-year swap rates in BRAP4; and
  - in 2020/21, 60% weight given to the average of three-to-10 year swap rates in BRAP1, 10% weight given to the average of the 10-year swap rates in BRAP2, 10% weight given to the average of the 10-year swap rates in BRAP3, 10% weight given to the average of the 10-year swap rates in BRAP4 and 10% weight given to the average of the 10-year swap rates in BRAP5;
- the trailing average DRP, calculated in the same manner as under the "no transition" approach (as set out above);
- swap transaction costs of:
  - 0.104% in 2017/18;
  - 0.092% in 2018/19;
  - 0.081% in 2019/20; and
  - 0.069% in 2020/21; and
- the new issue premium of 0.27%.

In each case, the trailing average DRP is calculated:

- in respect of the years 2007/08 to 2013/14, as the average of Bloomberg and RBA estimates extrapolated to ten years using the AER methodology (as set out in Table 8 of CEG's latest report[127]); and

[127] CEG, *Curve testing and selecting averaging periods*, January 2016 (Attachment 10.27 to this Revised AA Proposal).

- in respect of the years 2014/15 to 2019/20, by undertaking testing using the approach set out in Section 5 of, and Appendix A to, the June 2015 CEG report[128] (calculating the sum of squared errors from observed bond data of difference in third-party yield estimates extrapolated to ten years using AER and SA Power Networks extrapolation methodologies) and selecting the data source (or sources) and extrapolation method (or methods) that provide the best fit to the data for the relevant regulatory year.[129]

AGN refers to and repeats its cost of debt position regarding the three approaches referred to in this Revised AA Proposal, as set out at the end of section 1.2 above.

1.5.7 Averaging periods

In the Initial AA Proposal, AGN proposed different averaging periods for the base rate (shorter) and the DRP (longer). In the Draft Decision, the AER rejected this proposal (and adopted AGN's nominated base rate averaging period for the 2016/17 regulatory year and AGN's nominated DRP averaging periods for the subsequent regulatory years of the AA period[130]) on the bases that:

- separating the averaging periods would add further complexity and cost to the administration of regulation (which complexity and cost is not outweighed by other benefits);[131]
- the approach was not proposed by any other service provider;[132]
- there is no evidence that separated averaging periods are consistent with the debt management strategy used by many firms;[133]
- the rationale for separating the averaging periods is inconsistent with the AER's view of the efficient financing practices of a BEE as it transitions to the trailing average approach (which does not include entering into hedging instruments after the first year of the transition);[134] and
- separating the averaging periods is not necessary to prevent volatility in DRP estimates or to reduce any inverse correlation between the prevailing DRP and base rates.[135]

The AER has not identified what further complexity or cost would be added to the regulatory process as a result of AGN's proposal. Nor is it evident that there would be any significant increase in cost or complexity in circumstances where the averaging periods, data sources and extrapolation methods (and the method for testing and choosing between those data sources and extrapolation methods) are set out clearly in AGN's proposal. CEG has advised that the additional data collection and computation tasks associated with the approach are trivial.[136]

The fact that other service providers have not similarly nominated separate averaging periods does not, as the AER suggests, negate AGN's reasoning that separating the periods would be consistent with efficient debt management practices. As the Draft Decision notes, service providers in the current round of reviews have taken varied approaches to the nomination of averaging periods, which the AER notes suggests "*there is no single 'best' approach that is universally accepted*".[137] The relevant consideration is whether AGN's

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128 CEG, *The hybrid method for the transition to the trailing average rate of return on debt*, June 2015 (Attachment 10.22 to AGN's Initial AA Proposal).

129 The results of this testing for 2014/15 are set out in CEG, *Curve testing and selecting averaging periods*, January 2016, section 2.3 (Attachment 10.27 to this Revised AA Proposal).

130 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-250.

131 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-609.

132 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-610.

133 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-610.

134 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-253, 610.

135 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-611.

136 CEG, *The hybrid method for the transition to the trailing average rate of return on debt*, June 2015, pp83-84; CEG, *Curve testing and selecting averaging periods*, January 2016, pp13-4 (Attachment 10.27 to this Revised AA Proposal).

137 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-254 to 255.

proposal advances the ARORO and the NGO, not whether it is consistent with other service providers' proposals.

CEG has also provided explanation as to why a BEE may continue to enter into hedging instruments (i.e. interest rate swaps) after the first year of the transition period, contrary to the AER's views of the efficient financing practices of the BEE, and why this would reflect an efficient debt management strategy. There is no evidence of actual practice in this regard, as annual updating of the return on debt is yet to be implemented.[138]

Further, CEG has explained that the logic of separating the proposals is not to reduce volatility in the DRP allowance *per se*, but rather to reduce the magnitude and volatility of any mismatch between the total cost of debt allowance and the service provider's actual debt costs.[139]

For these reasons, AGN maintains that the ARORO and the NGO are best advanced through the use of separate averaging periods for the base rate and DRP.

No averaging periods for past year base rates (as are required to be estimated under the "no transition" approach) were specified in AGN's Initial AA Proposal. In this Revised AA Proposal, AGN nominates the averaging periods set out in Confidential Attachment 10.2A to this Revised AA Proposal for the purposes of the "no transition" approach.

For the avoidance of doubt, AGN confirms that it maintains its original proposal (as set out in Confidential Attachment 10.2 to the Initial AA Proposal) in respect of the averaging periods nominated for determining the return on equity (as accepted by the AER in the Draft Decision), and for determining the return on debt under the "hybrid transition" approaches.

The AER also noted in the Draft Decision that either AGN's proposed averaging periods for the base rate or its proposed averaging periods for the DRP would be consistent with the Rate of Return Guideline. However, as a result of its decision that separate averaging periods were not appropriate, the AER had to choose between them.[140] If it is not appropriate to separate the averaging periods for the base rate and DRP (which, in AGN's view, it is for the reasons set out above), then AGN proposes that the (shorter) averaging periods nominated for the base rate (rather than the longer periods nominated for the DRP) should apply for all regulatory years of the AA period. As advised above, AGN notes that in the Draft Decision the AER stated that such a nomination would be consistent with the Rate of Return Guideline.[141]

1.5.8 New issue premium

As noted in AGN's initial proposal, the third party data series that are used to estimate the return on debt are based on observations in the secondary debt market. These data sources therefore do not reflect any premium required for new debt issues.

AGN's initial proposal and the supporting expert report from CEG set out the economic rationale and empirical evidence for a new issue premium. CEG's analysis indicates that the best estimate of the new issue premium that is relevant to a benchmark debt management strategy of issuing 10 year BBB rated debt is 27 basis points.[142]

In the Draft Decision, the AER states that "*the empirical evidence on the new issue premium is inconclusive*" and that "*there does not appear to be a consensus among experts on how the new issue premium should be measured*".[143] The AER also states that it has some specific concerns with CEG's methodology.

AGN does not agree with the concerns expressed by the AER in relation to CEG's methodology. In response to the Draft Decision, CEG has prepared a further report which concludes that:

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138 CEG, *Curve testing and selecting averaging periods*, January 2016, pp12-14 (Attachment 10.27 to this Revised AA Proposal).
139 CEG, *Curve testing and selecting averaging periods*, January 2016, p14 (Attachment 10.27 to this Revised AA Proposal).
140 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-253.
141 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-253.
142 CEG, *New Issue Premium*, October 2014, p54 (Attachment 10.24 to AGN's Initial AA Proposal).
143 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-208.

- Advice of Handley relied upon by the AER in rejecting the new issue premium has been misinterpreted by the AER.[144]

- The new issue premium observed in the market is not a result of inefficient financing costs, as posited by the AER. Rather, it is a result of imperfections in the market (within which the BEE operates) and considerations that apply generally to the majority of issuers of investment grade debt.[145]

- The AER has erred in assuming that the BEE would not issue material debt in foreign currencies, whereas the evidence shows that the dominant source of long term bond issuance for Australian companies is in foreign currencies.[146]

- The AER's criticisms of CEG's empirical analysis are not valid.[147]

- The AER's interpretation of international evidence does not support the view that there is no evidence of a new issue premium (in Australia or elsewhere).[148]

AGN considers that CEG's analysis provides clear evidence of a positive and significant new issue premium. Therefore, AGN maintains its view that a new issue premium of 27 basis points should be included in the return on debt allowance.

1.6 AGN Response to the Draft Decision – Return on equity

1.6.1 Introduction

The AER's Draft Decision in relation to the return on equity is based on the following reasoning:

1. The AER considers that the SL CAPM should be used as the foundation model to estimate the return on equity. AGN understands that the AER's reasons for adopting this approach are as follows:

   a. the SL CAPM model is the current standard asset pricing model of modern finance both in theory and in practice;[149]

   b. the SL CAPM is superior to all other models considered by the AER, in terms of estimating the return on equity of the BEE;[150]

   c. use of the SL CAPM as the foundation model, at least as applied by the AER, will not result in a downward biased estimate of the cost of equity capital;[151] and

   d. use of alternative models will not lead to an outcome which better achieves the ARORO.[152] The AER expresses a number of concerns in relation to these alternative models.

2. An equity beta of 0.7, when applied in the SL CAPM, will deliver a return on equity that contributes to achievement of the ARORO. The AER considers that:[153]

   a. a reasonable range for the equity beta based on evidence from samples of domestic energy network businesses is 0.4 to 0.7; and

144 CEG, *Critique of AER analysis of New Issue Premium*, December 2015, pp3-4 (Attachment 10.30 to this Revised AA Proposal).
145 CEG, *Critique of AER analysis of New Issue Premium*, December 2015, pp4-7 (Attachment 10.30 to this Revised AA Proposal).
146 CEG, *Critique of AER analysis of New Issue Premium*, December 2015, pp8-9 (Attachment 10.30 to this Revised AA Proposal).
147 CEG, *Critique of AER analysis of New Issue Premium*, December 2015, pp9-16 (Attachment 10.30 to this Revised AA Proposal).
148 CEG, *Critique of AER analysis of New Issue Premium*, December 2015, pp16-22 (Attachment 10.30 to this Revised AA Proposal).
149 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-33.
150 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-33.
151 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-63.
152 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-33 to 34.
153 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-33 to 37.

b. additional information taken into account by the AER – specifically empirical estimates for international energy networks and the theoretical principles underpinning the Black CAPM – indicate that an equity beta at the top of this range is appropriate.

3. An MRP of 6.5% reflects prevailing market conditions and contributes to achievement of the ARORO.[154]

   The AER determines a "baseline" estimate of the MRP of 6.0% based on historical data, and then uses DGM analysis and other evidence to determine whether its estimate should be above or below that baseline. The AER considered that DGM evidence could justify a point estimate above the 6.0% baseline, but did not support a point estimate above the top of the range implied by historical excess returns (6.5%).

   The AER adopts a different interpretation of some of the empirical evidence to AGN, including:

   a. the AER adopts a different interpretation of the historical excess returns data;

   b. the AER does not agree that the Wright approach should be used to estimate the MRP. This is because the AER considers that the Wright approach is an alternative implementation of the CAPM, designed to produce information at the return on equity level;

   c. the AER does not agree that independent valuation reports should inform MRP estimation (only the overall return on equity); and

   d. the AER does not agree with SFG's construction of the DGM.

4. The return on equity estimate from the SL CAPM is broadly supported by:[155]

   a. estimates using the Wright approach;

   b. estimates from other market participants, including practitioners and regulators, particularly estimates used in Grant Samuel's recent report for Envestra Limited (Envestra);

   c. the fact that it is above the prevailing return on debt; and

   d. the fact that the regulatory regime to date has been supportive of investment.

This reasoning is based on a number of errors of fact and logic, which are described in detail below. As a consequence of these errors, the return on equity determined by the AER will not contribute to the achievement of the ARORO and does not reflect prevailing conditions in the market for equity funds. For reasons discussed below, the return on equity derived from the AER's approach will be below what is required to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers.

AGN continues to believe that the ARORO is best achieved through an approach that properly has regard to estimates from all relevant return on equity models. In its Initial AA Proposal, AGN proposed that each of the SL CAPM, the Black CAPM, the FFM and DGM be estimated, and that these estimates each be given material weight in deriving a return on equity estimate. AGN maintains its view that this approach would best achieve the ARORO. This approach leads to an estimate of the prevailing return on equity of 9.76%.[156]

However, if the AER proposes to continue relying solely on the SL CAPM to estimate the return on equity, the AER must change the way it implements this model. The way in which the SL CAPM is applied in the Draft Decision leads to a return on equity that is not consistent with the ARORO and does not reflect prevailing market conditions. The AER does not properly recognise the weaknesses of the SL CAPM, nor does it account for these weaknesses in its application of the model. Further, the AER's practice of applying

154 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-35 to 36.
155 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-40 to 42.
156 Frontier, *An updated estimate of the required return on equity*, January 2016, section 1.2 (Attachment 10.31 to this Revised AA Proposal).

an effectively fixed risk premium to a variable risk-free rate is not appropriate in current market conditions, since it leads to the return on equity moving in lock-step with changes in the risk-free rate.

This Attachment outlines an alternative approach that involves properly adjusting SL CAPM parameters to deliver a return on equity that contributes to the achievement of the ARORO and reflects prevailing market conditions. This involves:

- making a transparent and empirically based adjustment to the equity beta estimate to account for the known shortcomings of the SL CAPM, particularly low beta bias and book-to market bias; and
- deriving the MRP in a way that gives appropriate weight to measures of the prevailing (current) MRP.

This leads to an estimate of the prevailing return on equity of 9.84%.[157]

1.6.2 The AER's return on equity estimate is below what is required by the market

The Draft Decision does not point to any genuine consideration of whether the AER's estimate of the return on equity of 7.3% contributes to the ARORO and is commensurate with prevailing market conditions. The AER has rigidly applied its foundation model without proper consideration of whether the output of this model is consistent with the requirements of the NGR.

This is despite evidence, including from the AER's own "cross-checks", that its return on equity estimate is below the efficient equity financing costs of the BEE and not commensurate with prevailing market conditions.

In particular, the evidence presented in the Draft Decision indicates that:

- the AER's estimate of the return on equity is below any comparable recent estimate from market practitioners. Specifically:

  – the AER's estimate is below the lower end of the range of imputation-adjusted estimates of the return on equity from independent expert reports surveyed by the AER (a range of 8.98% to 14.67%);[158] and

  – the AER's estimate is at the bottom of the range of imputation-adjusted estimates of the return on equity from recent broker reports (a range of 7.3% to 9.3%);[159]

- the AER's estimate of the return on equity is below the range indicated by the 'Wright approach'. If properly applied (i.e. with an equity beta that reflects the AER's estimate of this parameter), the Wright approach indicates a range for the return on equity of 7.8% to 9.7%;[160]

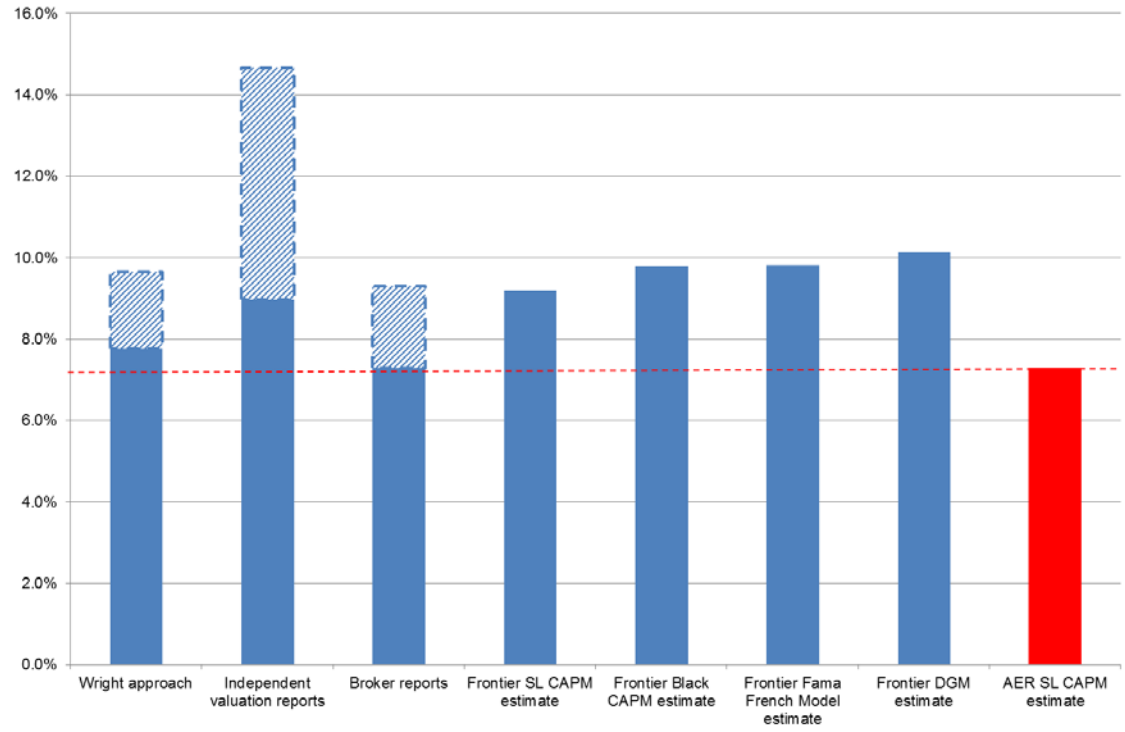
- the AER's estimate of the return on equity is below that indicated by current market prices for traded equities and the AER's DGM market-wide analysis. The AER's DGM-based estimates of the MRP implied a range for the market return of 10.26% to 11.36%,[161] which is significantly higher than the AER's implied estimate of the market return of 9.26%;[162] and

[157] Frontier, *An updated estimate of the required return on equity*, January 2016, section 1.3 (Attachment 10.31 to this Revised AA Proposal).
[158] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-523.
[159] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-526.
[160] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-518.
[161] The AER's DGM estimates of the MRP range from 7.5% to 8.6% (Draft Decision, p3-366). These are added to the risk-free rate of 2.76% to derive estimates of the market return from the AER's DGM.
[162] This is calculated as the sum of the risk-free rate (2.76%) and the AER's estimate of the MRP (6.5%).

- the AER's estimate based on its implementation of the SL CAPM is below estimates from all other relevant return on equity models. Frontier estimates a return on equity of 9.75% using the Black CAPM, 9.76% using the FFM and 10.10% using the DGM, and 9.14% based on its own parameters for the SL CAPM.[163]

The above evidence is summarised in Figure 1 below.

FIGURE 1: COMPARISON OF AER RETURN ON EQUITY ESTIMATE WITH OTHER AVAILABLE ESTIMATES



Note: Shaded bars indicate ranges of estimates from broker reports, independent expert reports and the Wright approach.

The outcome observed above is due to the AER mechanistically applying the foundation model approach developed in the Rate of Return Guideline, without any meaningful consideration of whether such an approach leads to an estimate of the return on equity that is consistent with the ARORO and commensurate with prevailing market conditions.

More specifically, this is the result of the AER:

- relying solely on the output of a model that is known to produce biased estimates, without properly correcting for that bias;
- applying this model in a way that does not reflect market practice and which results in the return on equity simply tracking movements in the risk-free rate; and
- making errors in the interpretation of key evidence.

Each of these errors in the AER's approach is addressed in the following sections.

1.6.3 The AER's reliance on the SL CAPM

The AER concluded that the output of its application of the SL CAPM should be used as its estimate of the cost of equity, including because:

[163] Frontier, *An updated estimate of the required return on equity*, Table 1 (Attachment 10.31 to this Revised AA Proposal).

- the SL CAPM is the superior model;
- the SL CAPM, at least as applied by the AER, does not produce biased estimates of the required return on equity; and
- other proposed models are not fit for purpose, including because these other models are focussed on explaining historical market outcomes, rather estimating the required return on equity, consistent with the ARORO.

AGN considers that each of these critical findings is not consistent with the evidence before the AER.

1.6.3.1 The AER has erred in finding that the SL CAPM is the clearly superior model

The AER remains of the view that "*the SLCAPM is the clearly superior model to use as the foundation model*".[164] However no evidence is cited in support of this statement, and AGN is not aware of any evidence that supports this view.

The evidence before the AER in fact shows that the SL CAPM has known weaknesses. In particular, as discussed below, the SL CAPM is known to produce downwardly biased estimates of the required return on equity for low-beta stocks.

AGN notes that none of the expert reports commissioned by the AER state that the SL CAPM is superior to other models. AGN is not aware of any expert report before the AER which expresses this view.

Indeed McKenzie & Partington observe:[165]

> *"…the [SL CAPM] has its weaknesses, but these are well documented and in many cases can either be diagnosed or perhaps compensated for in empirical practice."*

As discussed below, it is not clear whether the AER has sought to compensate for the known weaknesses of the SL CAPM, as suggested by McKenzie & Partington, or whether it has simply ignored them. To the extent that the AER has sought to compensate for these weaknesses, by taking the upper bound of its equity beta range, it cannot reasonably be satisfied it has adequately compensated for their effect, because it does not seek to analyse or quantify this effect.

McKenzie & Partington also state:[166]

> *"The final estimate of the expected return on equity may have regard to a broad range of relevant material including a range of multifactor models such as the Fama and French (1993) and the APT of Ross (1976), inter alia. Many of these competing models nest this foundation model and so potentially make more use of available information."*

Certainly McKenzie and Partington do not appear to view the SL CAPM as superior to all other models. Rather they acknowledge the weaknesses of the model and recommend that any estimate of the return on equity may take into account a wider range of models, including the FFM.

Associate Professor Handley also acknowledges the critical weakness of the SL CAPM, noting:[167]

> *"An apparent weakness of the Sharpe-CAPM is the empirical finding, for example by Black, Jensen and Scholes (1972) and Fama and French (2004), that the relation between beta and*

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164 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-538.
165 Michael McKenzie and Graham Partington, *Report to the AER – Part A: Return on Equity*, October 2014, p9.
166 Michael McKenzie and Graham Partington, *Report to the AER – Part A: Return on Equity*, October 2014, p9.
167 John C Handley, *Advice on the Return on Equity: Report prepared for the Australian Energy Regulator*, 16 October 2014, p5.

average stock returns is too flat compared to what would otherwise be predicted by the Sharpe-CAPM – a result often referred to as the low beta bias."

The weaknesses and limitations of the SL CAPM were identified in AGN's original proposal and the supporting expert reports. In particular, SFG referred to the large body of empirical evidence which shows that the SL CAPM will tend to produce biased estimates of the required return on a low-beta or value stock, and may not fully capture all factors affecting stock returns.[168] SFG's reports also explained how other models such as the Black CAPM and FFM were developed specifically to overcome these known weaknesses in the SL CAPM design.

Some of the key empirical evidence demonstrating weaknesses in the SL CAPM is summarised in Table 3 below.

TABLE 3: SUMMARY OF KEY EMPIRICAL EVIDENCE IN RELATION TO SL CAPM PERFORMANCE

Study	Key conclusions
Black, Jensen and Scholes (1972)[169]	Black, Jensen and Scholes (1972) tested the SL CAPM theory against empirical data. Their results indicated that the empirical relationship between systematic risk exposure and returns was not consistent with SL CAPM theory. The relationship in the empirical data indicated a higher intercept and flatter slope than that indicated by the SL CAPM. The authors conclude that their results appeared to be strong evidence favouring rejection of the traditional form of the asset pricing model (i.e. the SL CAPM).
Friend and Blume (1970)[170]	The empirical analysis by Friend and Blume (1970) indicates that low-beta stocks generate higher returns than the SL CAPM would suggest and high-beta stocks tend to generate lower returns than the SL CAPM predicts.
Fama and Macbeth (1973)[171]	Fama and Macbeth (1973) empirically test the assumption of the SL CAPM that the return on a zero-beta asset will be equal to the risk-free rate. Consistent with the earlier findings of Black, Jensen and Scholes (1972), they conclude that this assumption is not supported by the empirical data.
Rosenberg, Reid and Landstein (1985)[172]	The study by Rosenberg, Reid and Landstein, as well as other studies identified a number of SL CAPM anomalies, where stock-specific characteristics seemed related to differences in returns. In particular, the book equity value divided by the market equity value (book-to-market ratio) appeared to be related to variation in returns.
Fama and French (1992)[173]	Fama and French (1992) demonstrated relationships between returns and book-to-market and size factors which are not accounted for in the SL CAPM.
Brealey, Myers and Allen (2011)[174]	A recent study by Brealey, Myers and Allen confirms the findings of earlier studies, such as the study by Black, Jensen and Scholes (1972), that the pattern of empirical data is not consistent with what the SL CAPM would predict.

168 SFG, *The required return on equity for regulated gas and electricity network businesses*, June 2014, [46]-[60] (http://www.aer.gov.au/system/files/ActewAGL%20-%20E3%20SFG%20-%20The%20required%20return%20on%20equity%20for%20regulated%20gas%20and%20electricity%20network%20businesses%20-%202014.pdf).

169 Black, F., M.C. Jensen, and M. Scholes, 1972, "The Capital Asset Pricing Model: Some empirical tests," in *Studies in the Theory of Capital Markets*, Michael C. Jensen, ed., New York: Praeger, 79–121, referred to in: SFG, *The required return on equity for regulated gas and electricity network businesses*, 6 June 2014, pp20-22.

170 Friend, I., M. Blume, 1970, "Measurement of Portfolio Performance under Uncertainty," *American Economic Review*, 60, 561-75, referred to in: SFG, *The required return on equity for regulated gas and electricity network businesses*, 6 June 2014, pp22-23.

171 Fama, E.F., J.D. MacBeth, 1973, "Risk, return, and equilibrium: Empirical tests," *Journal of Political Economy*, 81, 607-636, referred to in: SFG, *The required return on equity for regulated gas and electricity network businesses*, 6 June 2014, pp23-24.

172 Rosenberg, B., K. Reid, and R. Lanstein (1985), "Persuasive evidence of market inefficiency," *Journal of Portfolio Management* 11, 9-17, referred to in: SFG, *The Fama-French model: Report for Jemena Gas Networks, ActewAGL, Transend, TransGrid, and SA PowerNetworks*, 13 May 2014, p15 (http://www.aer.gov.au/system/files/SAPN%20-%2026%20PUBLIC%20-%20SFG%20The%20Fama-French%20Model%2013%20May%202014.pdf).

173 Fama, E.F. and K.R. French (1992), "The cross-section of expected stock returns," *Journal of Finance* 47, 427-466, referred to in: SFG, *The Fama-French model: Report for Jemena Gas Networks, ActewAGL, Transend, TransGrid, and SA PowerNetworks*, 13 May 2014.

174 Brealey, R.A., S.C. Myers, and F. Allen, 2011, *Principles of Corporate Finance*, 10th ed., McGraw-Hill Irwin, New York, NY, USA, referred to in: SFG, *The required return on equity for regulated gas and electricity network businesses*, 6 June 2014, p24.

Study	Key conclusions
Brailsford, Gaunt and O'Brien (2012)[175]	Brailsford, Gaunt and O'Brien (2012) provide evidence, using Australian data, that value stocks tend to earn higher returns than the SL CAPM predicts should be the case and growth stocks tend to earn less than the SL CAPM predicts should be the case. The evidence that Brailsford, Gaunt and O'Brien (2012) provide indicates that the SL CAPM underestimates the returns required on value stocks and overestimates the returns to growth stocks.
NERA (2015)[176]	Based on Australian data, and using both in-sample and out-of-sample tests, NERA conclude that there is evidence of bias in the SL CAPM. NERA states that the evidence indicates that the SL CAPM significantly underestimates the returns generated by low-beta portfolios and overestimates the returns generated by high-beta portfolios. In other words, the model has a low-beta bias. The extent to which the SL CAPM underestimates the returns to low-beta portfolios is both statistically and economically significant.

The body of empirical literature relating to identified weaknesses in the SL CAPM, and the development of alternative models to overcome the well-recognised deficiencies in this model, is discussed at some length by the Nobel Prize Committee, in the explanatory material accompanying the award of the Nobel Prize for contributions to this field.[177] The Committee observes that by the end of the 1970s, the empirical support for the SL CAPM was increasingly being questioned in a number of studies, including those referred to above.

In light of the above evidence, the AER cannot rationally conclude that the SL CAPM is superior to all other models. The evidence clearly shows that the SL CAPM has weaknesses and that there are alternative models available, some of which have been designed to address such weaknesses.

1.6.3.2 The AER has erred in finding that its implementation of the SL CAPM will produce unbiased estimates

The AER considers the issue of potential bias in the SL CAPM in the Draft Decision, but concludes:[178]

> *"We do not consider the use of the SLCAPM as the foundation model will result in a downward biased estimate of the return on equity for a benchmark efficient entity."*

Elsewhere in the Draft Decision the AER states that:[179]

> *"There is no compelling evidence that the return on equity estimate from the SLCAPM will be downward biased given our selection of input parameters."*

It is not entirely clear from these statements whether the AER has found that:

1. in general, the SL CAPM will produced unbiased estimates of the required return on equity (Finding 1); or
2. to the extent that the SL CAPM may produce biased estimates, the AER's selection of input parameters adequately corrects for any bias (Finding 2).

It must be that the AER has made either Finding 1 or Finding 2, in order for it to be satisfied that its approach will deliver a return on equity which contributes to achievement of the ARORO.

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175 Brailsford, T., C. Gaunt and M. O'Brien, 'Size and book-to-market factors in Australia', *Australian Journal of Management*, 2012, pp261-281, referred to in: NERA, *Review of the Literature in Support of the Sharpe-Lintner CAPM, the Black CAPM and the Fama-French Three-Factor Model,* March 2015 (Attachment 10.10 to AGN's Initial AA Proposal).

176 NERA, *Empirical Performance of Sharpe-Lintner and Black CAPMs*, February 2015 (Attachment 10.12 to AGN's Initial AA Proposal).

177 Economic Sciences Prize Committee of the Royal Swedish Academy of Sciences, *Understanding Asset Prices: Scientific Background on the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2013*, 14 October 2013, section 7.

178 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-131.

179 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-63.

Empirical evidence does not support Finding 1

AGN considers that Finding 1 would involve a critical error of fact. Empirical evidence clearly demonstrates that the SL CAPM will lead to downwardly biased estimates of the return on equity for low-beta stocks. This empirical evidence is referred to in a number of the expert reports supporting AGN's original proposal, including:

- expert reports from SFG, referring to the early empirical analysis of SL CAPM performance which laid the foundations for the development of alternative models such as the Black CAPM and FFM. This included the work of Black, Jensen and Scholes (1972), Friend and Blume (1970) and Fama and Macbeth (1973) referred to above;[180] and

- NERA's comprehensive review of the empirical literature on the performance of the SL CAPM and alternative models. NERA concludes from its review of the SL CAPM literature:[181]

> *"It has been known for well over 40 years that empirical versions of the SL CAPM tend to underestimate the returns to low-beta assets and overestimate the returns to high-beta assets…*
>
> *These early results have been confirmed in many, more recent studies. These studies have also shown that the SL CAPM tends to underestimate the returns to value stocks and low-cap stocks."*

Further evidence of bias in SL CAPM estimates of the return on equity is provided by the recent analysis of NERA, using Australian data.[182] NERA concludes that the evidence indicates that the SL CAPM significantly underestimates the returns generated by low-beta portfolios and overestimates the returns generated by high-beta portfolios. In other words, the model has a low-beta bias. The extent to which the SL CAPM underestimates the returns to low-beta portfolios is both statistically and economically significant.

The AER's only response to this in the Draft Decisions was to observe that the results of NERA's analysis "*appear counterintuitive*".[183] This is not a proper basis for simply dismissing this very important piece of analysis. The fact that NERA's results were contrary to the AER's prior intuition is unsurprising, given that the AER may have expected the empirical relationship between beta and stock returns to reflect what is predicted by the SL CAPM. The fact that the empirical results were not consistent with the predictions of the SL CAPM is not a reason to dismiss the empirical analysis. Rather, this ought to have confirmed for the AER what the previous studies had indicated – that there is a significant weakness in the SL CAPM, in terms of its performance against the empirical data – or at least put the AER on notice that further genuine investigation is needed.

In dismissing the NERA analysis and earlier studies, the AER also refers to advice from Partington, which it considers supports a finding that the SL CAPM will not produce downwardly biased estimates. However the Partington advice referred to by the AER does not address the empirical evidence of low-beta bias in the SL CAPM (i.e. evidence that the SL CAPM underestimates the return on equity for stocks with a beta below one). Rather, in the passage referred to by the AER, Partington addresses an entirely separate issue of whether there may be a theoretical or statistical justification for adjusting equity beta estimates to account for statistical bias. The AER has misinterpreted the advice of its expert on this point.

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180 SFG, *The required return on equity for regulated gas and electricity network businesses*, June 2014, [46]-[60].

181 NERA, *Review of the Literature in Support of the Sharpe-Lintner CAPM, the Black CAPM and the Fama-French Three-Factor Model,* March 2015, p iii (Attachment 10.10 to AGN's Initial AA Proposal).

182 NERA, *Empirical Performance of Sharpe-Lintner and Black CAPMs*, February 2015 (Attachment 10.12 to AGN's Initial AA Proposal).

183 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-291.

There is no basis for Finding 2

The AER has not sought to advance any reasoned or principled basis for Finding 2 and, in any event, there can be no reasonable basis for such a finding. The AER does not seek to quantify the effect of such bias, nor does it make any transparent adjustment to its SL CAPM parameter estimates to correct for bias.

The AER does make an adjustment to its equity beta estimate, from what it refers to as "*the best empirical estimate*" of this parameter. However it is not clear whether this adjustment is intended to correct for bias in the SL CAPM. In any event, given that the AER does not seek to quantify the effect of SL CAPM bias, it cannot reasonably be satisfied that this adjustment adequately corrects for such bias.

Indeed the AER appears to acknowledge that its equity beta estimate should be adjusted upwards to correct for bias in the SL CAPM, but says it cannot ascertain by how much it needs to adjust its estimate because it does not empirically estimate the Black CAPM. The AER does not calculate a specific uplift to its beta to correct for SL CAPM bias, but instead makes an arbitrary upward adjustment in the hope that this will adequately account for the issue that it has identified. The AER states:[184]

> *"We consider the theoretical principles underpinning the Black CAPM demonstrate that market imperfections could cause the true (unobservable) expected return on equity to vary from the SLCAPM estimate. For firms with an equity beta below 1.0, the Black CAPM may predict a higher expected return on equity than the SLCAPM. We use this theory to inform our equity beta point estimate, and consider it supports an equity beta above the best empirical estimate implied from Henry's 2014 report. However, while the direction of this effect may be known, the magnitude is much more difficult to ascertain. We do not consider this theory can be used to calculate a specific uplift to the equity beta estimate to be used in the SLCAPM. This would require an empirical implementation of the Black CAPM, and we do not give empirical evidence from the Black CAPM a role in determining the equity beta for a benchmark efficient entity…"*

Ultimately, the AER adopts the top of its selected range for the SL CAPM equity beta – in effect, the AER makes an upward adjustment to the equity beta, from what it refers to as the "*best empirical estimate*" to the upper limit of its range. However given that the AER has not sought to quantify the effect of SL CAPM bias, it cannot reasonably be satisfied that choosing the top of its equity beta range will adequately correct for such bias.

AGN considers that selecting the top of the AER's equity beta range will not adequately correct for the bias in the SL CAPM indicated by Black CAPM theory. If the AER's parameter estimates are used in the Black CAPM along with the best available estimate of the zero-beta premium,[185] the return on equity estimated by the Black CAPM is above the return on equity estimated by the AER using the SL CAPM (and adopting the upper limit of its equity beta range).

Table 4 below shows that even if the AER's lower bound beta value is used in the Black CAPM, the resulting return on equity estimate is still above the AER's SL CAPM estimate using the upper bound beta value. If the AER's "*best empirical estimate*" of beta is used in the Black CAPM, the resulting return on equity estimate is significantly above the AER's SL CAPM estimate. This indicates that if the AER were to properly adjust its SL CAPM beta estimate to account for the bias in the SL CAPM indicated by Black CAPM theory, the resulting beta would need to be higher than 0.7.

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184 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-502.

185 Zero-beta premium of 3.34%, as estimated by SFG (SFG, *Cost of equity in the Black Capital Asset Pricing Model*, 22 May 2014, section 4 (http://www.aer.gov.au/system/files/SAPN%20-%2026%20PUBLIC%20-%20SFG%20Cost%20of%20equity%20in%20the%20Black%20Capital%20Asset%20Pricing%20Model%2022%20May%202014.pdf)).

TABLE 4: COMPARISON OF SL CAPM AND BLACK CAPM RETURN ON EQUITY ESTIMATES186

Model	Return on equity estimate
SL CAPM – equity beta 0.7; MRP 6.5%	7.3%
Black CAPM – equity beta 0.4 (AER lower bound); MRP 6.5%	7.4%
Black CAPM – equity beta 0.5 (AER "best estimate"); MRP 6.5%	7.7%
Black CAPM – equity beta 0.7 (AER upper bound); MRP 6.5%	8.3%

AGN agrees that, if the SL CAPM is to be used alone to estimate the return on equity, some adjustment needs to be made to its input parameters to account for the known weaknesses of the model. If the SL CAPM is used without any adjustment, the empirical evidence shows that the return on equity for low-beta stocks will be significantly under-estimated.

AGN's concern is that the AER's adjustment to the equity beta is not sufficient to account for the known weaknesses of the SL CAPM. As shown above, even if the AER's view as to the "*best empirical estimate*" of equity beta were to be accepted (AGN does not agree with this, for reasons set out in section 1.6.4.3 below), it is clear that adjusting the equity beta upwards to 0.7 does not account for the bias in the SL CAPM.

In this Revised AA Proposal, AGN puts forward an alternative method for estimating the return on equity using the SL CAPM alone, with an empirically based adjustment to account for the known weaknesses of this model. This alternative method is explained in section 1.6.6 below and the accompanying expert report from Frontier Economics.

1.6.3.3 The AER has erred in its findings in relation other available models

The AER raises a number of concerns with the other available return on equity models. Given these concerns, the AER decides to give these alternative models either no role in its determination of the return on equity, or a very limited role.

The key concerns raised by the AER are:

- alternative models are sensitive to input assumptions and choices around estimation periods and methodologies;
- some alternative models are not empirically reliable;
- some alternative models are not designed to estimate ex ante returns;
- some alternative models (particularly the FFM) lack theoretical foundation;
- some alternative models (particularly the Black CAPM) are not widely used by market practitioners, academics or regulators; and
- some alternative models produce return on equity estimates that appear "very high".

For reasons discussed below, AGN considers that each of these concerns is unfounded. In several cases, the AER's method and reasons for rejecting this other evidence (or relegating it to an indirect role) are illogical and unreasonable and/or apply equally to the SL CAPM.

Complexity and sensitivity of models to assumptions

A key concern raised by the AER in relation to alternative return on equity models is that they are sensitive to inputs assumptions and methodological choices. For example the AER considers that the DGM is highly

186 All calculations are based on a risk-free rate of 2.76% (as used in the Draft Decision) and a Black CAPM zero-beta premium of 3.34% (as estimated by SFG – see: SFG, *Cost of equity in the Black Capital Asset Pricing Model*, 22 May 2014, section 4).

sensitive to assumptions around the growth rate of dividends.[187] In relation to the FFM, the AER identifies a range of different methodological choices which might lead to different results.[188]

Simply observing that a return on equity model is sensitive to input assumptions and methodological choices does not provide a basis for rejecting that model or giving it a very limited role. All return on equity models—including the SL CAPM—are sensitive to input assumptions. This is why it is important to estimate all model parameters as accurately as possible.

The same concern could be expressed in relation to the SL CAPM. Clearly the results produced by the SL CAPM could vary widely depending on one's choice of input parameters and the methodologies used to estimate those parameters. Just based on the AER's ranges for the equity beta and MRP set out in the Draft Decision (and holding the risk-free rate constant), the return on equity produced by the SL CAPM could range from 4.8% to 11.4%.[189] This wide range of values arises due to different approaches that could be taken to estimating the MRP, and different methodological and data choices which could be made in estimating the MRP or beta.

Grant Samuel, in its submission in response to the NSW draft decisions, expresses concern at the AER's unbalanced treatment of the DGM and SL CAPM in this regard. Grant Samuel notes:[190]

> *"The DGM, in its simplest form, has only two components to estimate – current dividend yield and the long term growth rate for dividends. The current yield is a parameter that can be estimated with a reasonably high level of accuracy, particularly in industries such as infrastructure and utilities. We accept that the question of the long term dividend growth rate becomes the central issue and is subject to a much higher level of uncertainty (including potential bias from sources such as analysts) and we do not dispute the comments by Handley on page 3-61.*
>
> *However, there is no way in which the issues, uncertainties and sensitivity of outcome are any greater for the DGM than they are with the CAPM which involves two variables subject to significant measurement issues (beta and MRP)."*

Dr Robert Malko, a regulatory expert in the United States (where the DGM is frequently used) similarly notes:[191]

> *"Certainly the DGM… is sensitive to its input assumptions and if it would be inappropriately implemented, it could deliver implausible results. In this regard, I see no difference between this and other models. If inappropriate inputs are used, any of the models can produce implausible results.*
>
> *It is common in United States regulatory determination processes for there to be debate between businesses, customers and the regulators concerning which inputs to use but these debates occur with a context in which expert testimony has regard to whether the inputs used deliver plausible results and decision making is guided by a body of court and regulatory precedent.*
>
> *Over-all, the wide acceptance and use of the DGM… in the United States demonstrates that this model is sufficiently robust for it to be useful in economic regulatory decision making."*

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187 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-80.
188 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-74.
189 That is, adopting a range for the MRP of 5.0% to 8.6% and a range for the equity beta of 0.4 to 0.7.
190 Grant Samuel, *Australian Energy Regulator – Draft Decision*, letter to the directors of TransGrid, 12 January 2015, p3 (Attachment 10.15 to AGN's Initial AA Proposal).
191 Statement of Dr J Robert Malko, 16 June 2015, [3.7.1]-[3.7.3] (Attachment 10.19 to AGN's Initial AA Proposal).

For the reasons expressed by Dr Malko, AGN considers that the sensitivity of a model to input assumptions should not be a reason for dismissing it.

Reliability of empirical estimates

A particular concern raised by the AER in relation to the Black CAPM is that estimates of the return on equity will be unreliable, because there is no reliable method to obtain an estimate of the zero-beta premium.

The AER's concern appears to be that, because different estimation techniques have produced varying estimates of the zero-beta premium, it cannot rely on any empirical estimates of this parameter. The AER states:[192]

> *"We consider SFG's latest estimate of the zero beta premium appears more plausible. However, we remain of the view that the large range of zero beta estimates by consultants indicates that the model is unsuitable for estimating the return on equity for the benchmark efficient entity."*

Besides noting that it is 'plausible', the AER has not sought to test the robustness or reliability of SFG's proposed value for the zero-beta premium. Instead, the AER has dismissed SFG's estimate on the basis that there are other differing estimates, some of which are 'implausible'.

AGN considers that this is an illogical and unreasonable approach to assessment of the proposed Black CAPM parameter values and return on equity estimate. The AER cannot reasonably conclude that all estimates of the zero-beta premium are unreliable, just because some estimates of this parameter appear implausible. The same logic could be used to dismiss just about any return on equity model, including the SL CAPM, to the extent that some estimates of the MRP or equity beta are considered unreliable.

This is particularly so given that detailed and compelling explanations have been provided as to why SFG's estimate differs from other estimates of the zero-beta premium. As explained by SFG, recent empirical studies have demonstrated the significance of the book-to-market factor in explaining variation in stock returns in Australia. It is for this reason that the SFG study, unlike earlier studies of the zero-beta premium, controls for this factor in the estimation estimates. SFG controls for this by forming portfolios that have approximately the same composition in terms of book-to-market ratio and other relevant firm characteristics.[193] As is clear from SFG's explanations, the difference between their estimates of the Black CAPM zero-beta premium and earlier estimates does not indicate that the model is empirically unreliable – rather, it reflects a development in the methodology for estimating this parameter.

AGN has proposed to use SFG's estimates of the zero-beta premium and required return on equity from the Black CAPM in estimating the return on equity. If the AER is to reject this proposal, it must first consider SFG's estimates and assess whether adopting these estimates would (either alone or in combination with other models or methods) contribute to the achievement of the ARORO. The AER cannot simply reject AGN's proposal on the basis that there are other estimates of Black CAPM parameters (which AGN has not sought to rely on) which the AER considers to be implausible.

Instead of seeking a reliable estimate of the Black CAPM zero-beta premium, the AER has effectively assumed this to be zero (by relying solely on the SL CAPM to estimate the return on equity). AGN considers that this is an unreasonable approach, in circumstances where the AER has identified the Black CAPM to be a relevant model. Given that the Black CAPM is clearly a relevant model, a proper examination should be undertaken of what the best estimate for the zero-beta premium is and this value should be used unless it is so unreliable that assuming a value known to be incorrect (a zero value) is a preferable outcome.

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192 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-317.

193 SFG, *Beta and the Black Capital Asset Pricing Model*, February 2015, [65] (Attachment10.8 to AGN's Initial AA Proposal); SFG, *Cost of equity in the Black Capital Asset Pricing Model,* 22 May 2014, section 4.

Lack of theoretical foundation

The AER has again raised a concern in relation to the theoretical foundation for the FFM.

This concern has been addressed in AGN's original proposal and the supporting expert reports of SFG and NERA.[194]

As explained by SFG, the basis for development of the FFM was in studies documenting the empirical failings of the SL CAPM.[195] These studies documented that when the stock market index is used as the only factor (as in the SL CAPM), the model does not fit the data, but when the additional FFM factors (size and book-to-market ratio) are included the model does fit the data better. These early findings have been confirmed by more recent analysis using Australian data. A recent study shows that while the size in not significant in the Australian data, the book-to-market factor is.[196]

The general theoretical foundation for the FFM is the same as for the SL CAPM, in that both models posit that there is a linear relationship between the expected return of a particular stock and the expected return of a mean-variance efficient portfolio.[197]

Where the theory of the FFM differs from SL CAPM theory is that in the FFM non-diversifiable risk is proxied by three factors, rather than one factor as implied by SL CAPM theory. The three factors posited by FFM theory are:[198]

- the excess return to the market portfolio;
- the difference between the return to a portfolio of high book-to-market stocks and the return to a portfolio of low book-to-market stocks (HML); and
- the difference between the return to a portfolio of small-cap stocks and the return to a portfolio of large-cap stocks (SMB).

The theoretical and empirical foundation for the FFM is discussed at some length by the Nobel Prize Committee, in the explanatory material accompanying the award of the Nobel Prize to Eugene Fama for contributions to this field.[199]

Models not designed to estimate ex ante returns

The AER expresses a concern in relation to the FFM that the model "*is not clearly estimating ex ante required returns*".[200]

It is curious that this criticism is only levelled at the FFM, given that theoretical foundation for the FFM is the same as for other asset pricing models, including the SL CAPM and Black CAPM. The key objective of all asset pricing models is to explain the cross section of stock returns, based on explanatory factors (such as market risk in the case of the SL CAPM) that have been observed to correlate with stock returns in the past. The basis for development of the FFM (and also the Black CAPM) was in studies documenting the failure of the SL CAPM to adequately explain variations in returns.

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194 SFG, *The Fama-French model*, 13 May 2014, pp27-30; SFG, *Using the Fama-French model to estimate the required return on equity,* February 2015 (Attachment 10.6 to AGN's Initial AA Proposal); NERA, *Review of the Literature in Support of the Sharpe-Lintner CAPM, the Black CAPM and the Fama-French Three-Factor Model*, March 2015, section 2.3 (Attachment 10.10 to AGN's Initial AA Proposal).

195 SFG, *The Fama-French model*, 13 May 2014, pp27-30; SFG, *Using the Fama-French model to estimate the required return on equity,* 13 February 2015 (Attachment 10.6 to AGN's Initial AA Proposal).

196 Brailsford, T., C. Gaunt, and M. O'Brien (2012), 'Size and book-to-market factors in Australia', *Australian Journal of Management*, 37, 261-281.

197 SFG, *The Fama-French model*, 13 May 2014, p27.

198 NERA, *Review of the Literature in Support of the Sharpe-Lintner CAPM, the Black CAPM and the Fama-French Three-Factor Model*, March 2015, p17 (Attachment 10.10 to AGN's Initial AA Proposal).

199 Economic Sciences Prize Committee of the Royal Swedish Academy of Sciences, *Understanding Asset Prices: Scientific Background on the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2013*, 14 October 2013, section 7.

200 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-71.

The reason for using any asset pricing model is that the historically observed relationships between returns, risk and other factors may be expected to continue in future. In this regard, the rationale for using the FFM is no different to the rationale for using the SL CAPM or Black CAPM.

As noted above, empirical analysis using Australian data shows that there is a statistically and economically significant relationship between returns and book-to-market ratios. Given the significance of this relationship in the historic data, and thus its explanatory power, there is no reason to expect that it would not continue in future. The AER's position on this topic is akin to saying that a prediction that the sun will rise tomorrow is not an 'ex ante analysis of expected behaviour' if it is based on observations that the sun has always risen in the past. Inductive reasoning is neither weak nor, of itself, lacking in predictive power.

Models not widely used

The AER's concern that alternative models are not widely used was also addressed in AGN's original proposal and supporting expert reports. AGN observed that while some of these models are yet to gain acceptance among Australian regulators, it is clear that they are widely used by academics, market practitioners and overseas regulators and that they are market respected.

AGN's position on this issue is further reinforced by recent evidence, including evidence of the use of models other than the SL CAPM in the United States.

Dr Robert Malko states, in relation to regulatory practice in the United States:[201]

> *"I have observed that in the United States, regulators and expert financial witnesses generally use multiple methods, at least two, when determining a reasonable point estimate for the cost of common equity for a regulated energy utility."*

Specifically in relation to the Black CAPM, Dr Malko states:[202]

> *"…although there is little explicit reference to the Black CAPM, in practice the use in the U.S. of the ECAPM by financial analysts both within and outside energy regulatory processes is essentially to the same effect."*

Dr Malko explains that the 'Empirical CAPM' (or ECAPM), as referred to in US practice, involves a higher intercept and flatter relationship between returns and beta than under the SL CAPM.[203] Thus, the Empirical CAPM as used in US practice is consistent with the theory of the Black CAPM.

This is consistent with evidence from SFG that both the Black CAPM and DGM are commonly used in rate of return regulation cases in other jurisdictions.[204] SFG also notes that the FFM, while not as widely used in regulatory practice, is widely used by market practitioners and is well recognised in academic literature.[205]

"Very high" return on equity estimates

A further concern raised by the AER in relation to the DGM is that:[206]

> *"The very high return on equity estimates from SFG's DGM model, equating to an equity beta of 0.94 in the SLCAPM, appear inconsistent with the results in Professor Olan Henry's 2014 report."*

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201 Statement of Dr J Robert Malko, 16 June 2015, [9.5] (Attachment 10.19 to AGN's Initial AA Proposal).
202 Statement of Dr J Robert Malko, 16 June 2015, [6.5] (Attachment 10.19 to AGN's Initial AA Proposal).
203 Statement of Dr J Robert Malko, 16 June 2015, [6.3] (Attachment 10.19 to AGN's Initial AA Proposal).
204 SFG, *The required return on equity for regulated gas and electricity network businesses*, 6 June 2014, p40.
205 SFG, *The Fama-French model*, 13 May 2014, pp17-22.
206 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-326.

The AER appears to be suggesting that, because the return on equity estimates produced by the DGM are higher than those produced by the SL CAPM (with the AER's preferred parameter values), the DGM estimates cannot be relied on.

This is an irrational and illogical approach to assessing the reliability of DGM estimates of the return on equity. This approach assumes that the SL CAPM estimates are accurate and reliable, and thus can be used as the benchmark to test the plausibility or reliability of estimates from other models. Adopting similar logic, one could conclude that the SL CAPM is unreliable because it produces estimates that are "very low" when compared to the DGM and any other models that produce higher estimates.

Alternatively, it may be that the AER considers that an implied equity beta of 0.94 would be "too high", because it is above its own estimate of that parameter. However there are two problems with such reasoning:

- First, this assumes that the AER's equity beta analysis is correct, and that any estimate which differs from its estimate of 0.7 (or falls outside its determined range of 0.4 to 0.7) must be incorrect. The AER appears to consider that its estimate is more likely to be correct, because it accords with its assumption that energy businesses are in general "low risk".

  However simply asserting that energy businesses are generally "low risk" does not provide a basis for preferring one equity beta estimate over another, particularly where both of these estimates are less than one. If the AER believes that energy network businesses are "low risk", all this would indicate is that the equity beta is likely to be less than one.

  In any event, AGN does not agree that low elasticity of demand for energy services indicates that network businesses are "low risk"—which is the AER's key reason for arguing that they are. It is well recognised that the relevant risks to a business include both operating and financial risks. Even if the AER considers the operating risk of energy networks to be relatively low (compared to the average firm), it must be recognised that financial risk is relatively high, due to high leverage when compared to the average firm in the market. Therefore the AER cannot reasonably conclude that overall, energy network businesses are "low risk".[207] One would need to test empirically the relative importance of operating and financial risks when assessing overall risk.

- More fundamentally, there is an implicit assumption that the SL CAPM will deliver unbiased estimates of the return on equity. If the SL CAPM is in fact delivering downwardly biased estimates (as indicated by the empirical evidence referred to above) then the implied equity beta needed to deliver a DGM-equivalent result must include an uplift to account for this bias. In other words, if there is a bias in the SL CAPM that is not accounted for in the AER's equity beta of 0.7, this will contribute to a higher equity beta being needed to deliver a DGM-equivalent result.

The AER is required to have regard to all relevant estimation methods, financial models, market data and other evidence.[208] The AER cannot reject relevant financial models simply on the basis that the results they produce are inconsistent with the results of the AER's preferred model. Where two or more relevant models produce conflicting results, it is incumbent on the AER to assess each of the models on their merits and on that basis decide how their results are to be taken into account in determining the return on equity.

When faced with two models which produce differing results there are three possible hypotheses:

1. the model producing the lower estimate is accurate and unbiased, while the other model is upwardly biased or has been incorrectly applied;

2. the model producing the higher estimate is accurate and unbiased, while the other model is downwardly biased or has been incorrectly applied; or

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[207] This issue is discussed further in the ENA's submission to the AER equity beta issues paper (ENA, *Response to the Equity Beta Issues Paper of the Australian Energy Regulator*, 28 October 2013, pp14-20) and in a recent report from Frontier (Frontier, *Review of the AER's conceptual analysis for equity beta*, June 2015 (Attachment 10.13 to AGN's Initial AA Proposal).

[208] NGR 87(5)(a).

3. there is a degree of error or imperfection in both models, and the correct outcome lies somewhere between or outside the two.

The AER has clearly not tested these possible hypotheses. Rather, the AER appears to have assumed that the first hypothesis is correct – i.e. that the SL CAPM is reliable and the DGM is not – without any rational basis. This is despite other evidence that suggests that either the second or third hypothesis is more likely to be correct. As noted above, there is empirical evidence that the SL CAPM will produce downwardly biased estimates of the SL CAPM for low-beta stocks.

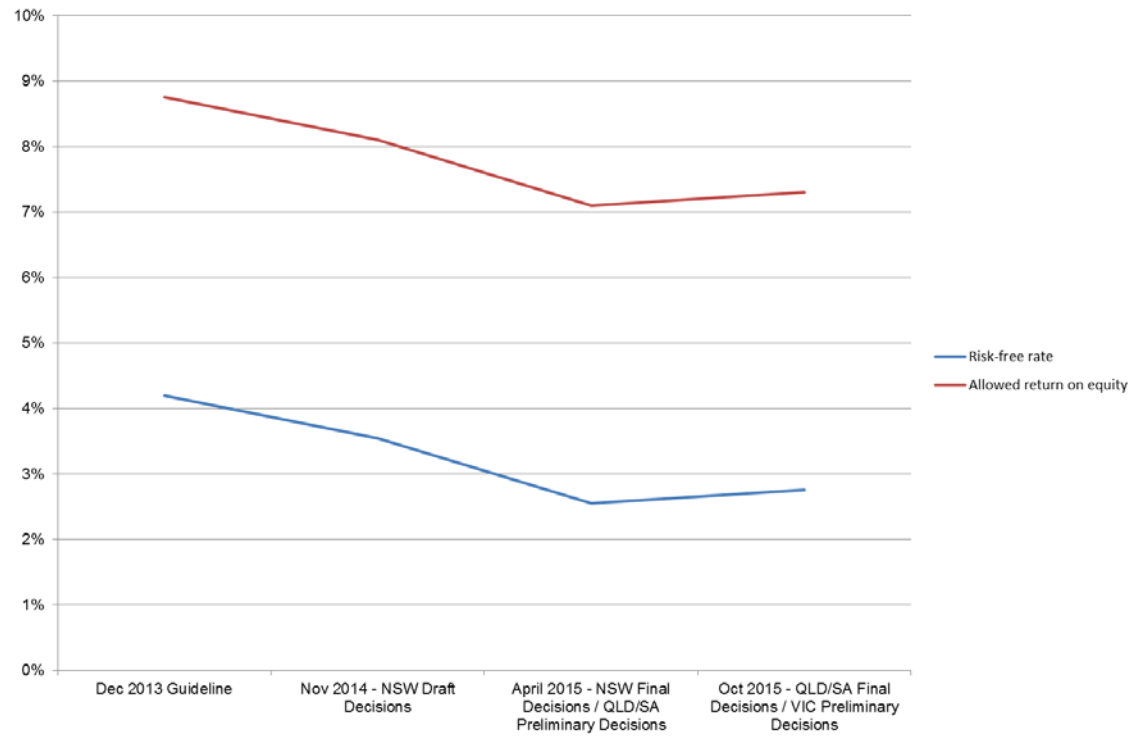
In any event, it is not clear that the DGM return on equity estimate is "very high", when compared to the results of other relevant models and the AER's cross-checks. When comparing the outputs of the four relevant models, it could rather be said that the SL CAPM estimate appears "very low" when compared to the results of the other three models (see Figure 1 above).

1.6.4 The AER's application of the SL CAPM

1.6.4.1 The AER's mechanistic application of the SL CAPM

The AER continues to apply the SL CAPM in a largely mechanistic manner, by adding an effectively fixed equity risk premium (ERP) to a variable risk-free rate. The result is that over the past two years the AER's return on equity estimate has moved in lock-step with the risk-free rate.

FIGURE 2: MOVEMENT IN THE ALLOWED RETURN ON EQUITY UNDER AER APPLICATION OF THE SL CAPM



This approach is at odds with evidence that the MRP has increased as the risk-free rate has fallen, including the evidence from the AER's own DGM. This evidence is discussed further below.

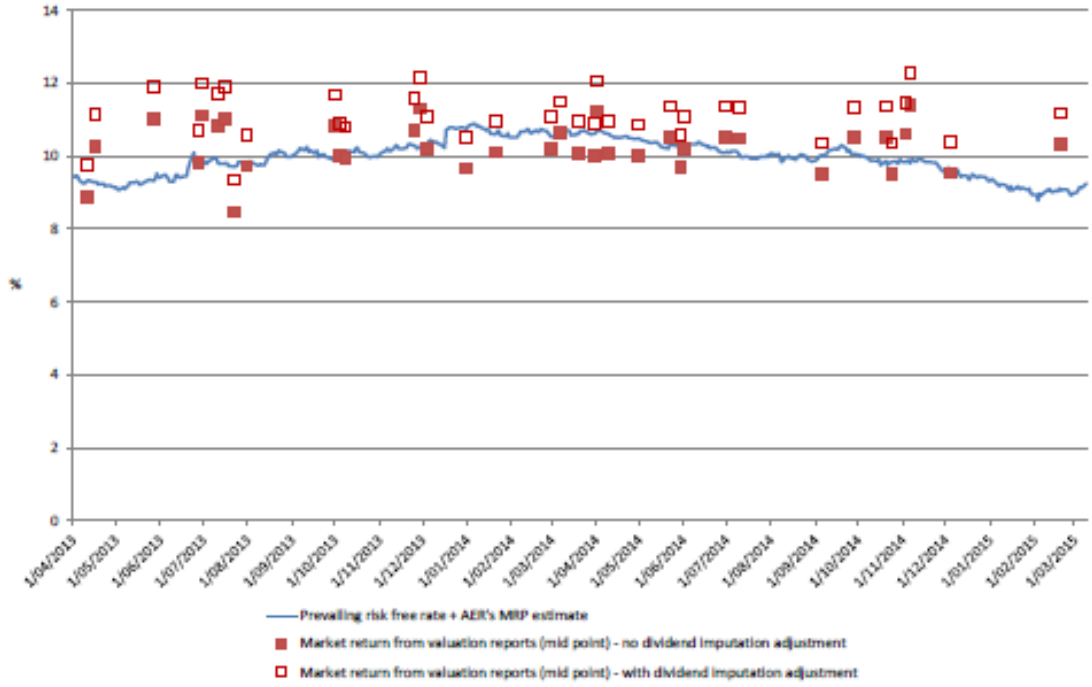
It is also at odds with how the SL CAPM is applied by market practitioners.

In an expert report that was submitted with AGN's Initial AA Proposal, Incenta explained that as the risk-free rate has fallen over the past 18 months, the vast majority of independent expert reports have adjusted either

the risk-free rate and/or MRP upwards.[209] The AER's approach of maintaining the same MRP estimate and combining this with a falling risk free rate is inconsistent with this observed market practice.

This market evidence is consistent with that presented by the AER in the Draft Decision.[210] The AER's analysis of independent expert reports (Figure 3-33 of the Draft Decision) indicates that as the risk-free rate has fallen over the past two years, estimates of the market return in independent expert reports have remained relatively steady. This can be contrasted with the AER's assumption (as illustrated by the blue line in Figure 3-33) that over this period the market return has fallen in lock-step with the risk-free rate.

Figure 3-33 Market return from valuation reports



Source: AER analysis of data sourced from the Thomson Reuters Connect 4 database.

The AER's analysis also indicates that independent experts have tended to increase their estimates of the ERP when the risk-free rate is low. Figure 3-32 in the Draft Decision indicates that, based on the AER's review of independent expert reports:[211]

- independent experts estimated the ERP to be in the range of 4% to 6% (not adjusted for imputation credits) when the risk-free rate is in excess of 5%; and
- independent experts estimated the ERP to be in the range of 9.5% to 11.5% (not adjusted for imputation credits) when the risk-free rate is below 3%.

The AER's analysis of independent expert reports is confirmed by more recent analysis from HoustonKemp. As noted above, HoustonKemp observes that in recent times a number of independent experts have used risk-free rates above the prevailing CGS yield, leading to more stability in their estimates of the prevailing market return (and implicitly higher MRP assumptions) than under the AER's approach.[212] This is shown in Figure 3 below. This evidence suggests that market practitioners do not believe that the return on equity has simply been moving in lock-step with the risk free rate in recent years.

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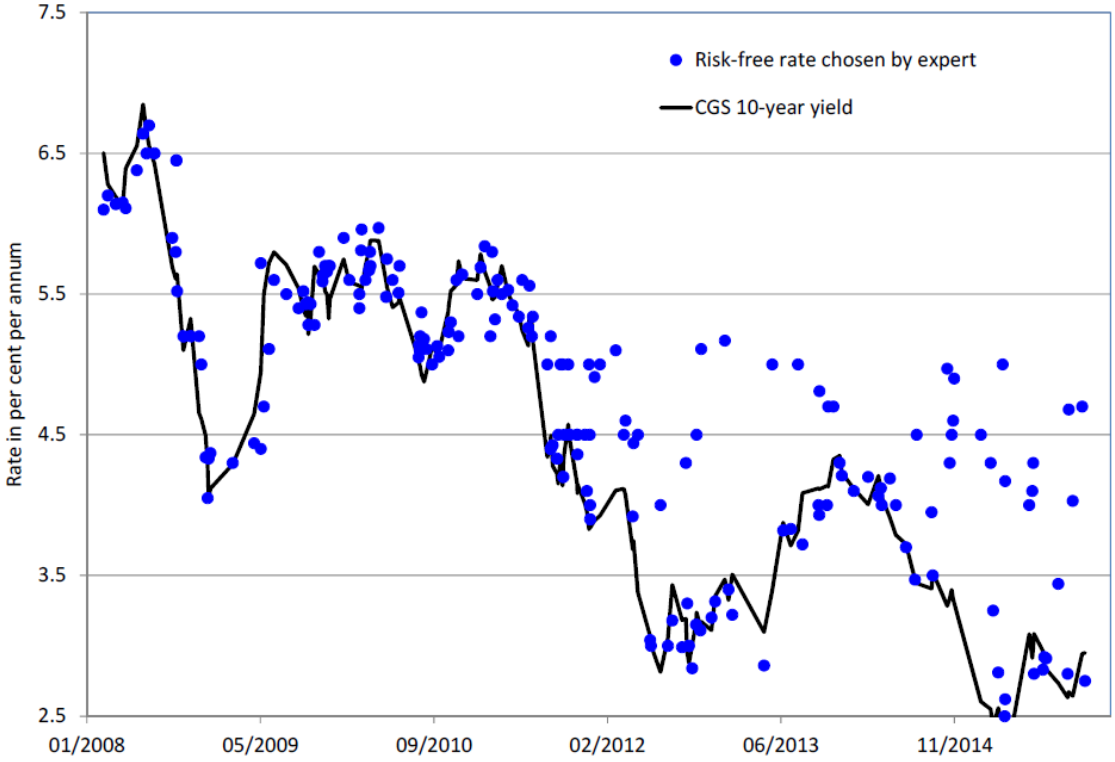
209 Incenta, *Further update on the required return on equity from independent expert reports*, February 2015 (Attachment 10.11 to AGN's Initial AA Proposal).

210 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-535.

211 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-359, Figure 3-32.

212 HoustonKemp, *The Cost of Equity: Response to the AER's Draft Decisions for the Victorian Electricity Distributors, ActewAGL Distribution and Australian Gas Networks*, January 2016, p43 and Figure 7 (Attachment 10.32 to this Revised AA Proposal).

FIGURE 3: RISK-FREE RATES CHOSEN BY INDEPENDENT EXPERTS AND 10-YEAR CGS YIELD AGAINST TIME



Note: Data are from the Connect-4 database, the ASX and the RBA. The 10-year CGS yields are interpolated from the RBA files f16.xls, f16hist.xls and f16hist2013.xls.

An assumption that the return on equity moves in lock step with CGS yields is inappropriate in current market conditions. Further evidence provided with this submission demonstrates that the recent decline in CGS yields has been driven by factors which would not be expected to affect the return on equity to the same extent.

CEG points to evidence from numerous Australian and international authorities that yields on AAA-rated sovereign government debt (including CGS) have been forced down in recent years by global forces, including:[213]

- shrinking supply of AAA-rated Sovereign debt globally and shrinking supply of substitutes in the form of safe private sector debt;
- heightened relative risk aversion and increased levels of perceived relative risk for equity vis-à-vis government debt; and
- heightened demand for liquid assets post GFC – including due to changes to banking regulations.

CEG explains that none of these factors that have lowering CGS yields would be expected to also lower the return on equity. CEG concludes:[214]

> *"None of these factors can be expected to lower the cost of equity for private corporations. Consequently, to the extent that these factors do explain, at least in part, unprecedented low government bond yields then it follows that the cost of equity will not have fallen in line with falling government bond yields. This is just another way of saying that the risk premium, measured relative to government bond yields, will have risen."*

[213] CEG, *Measuring risk free rates and expected inflation*, April 2015, p1.
[214] CEG, *Measuring risk free rates and expected inflation*, April 2015, p2.

Frontier Economics similarly notes that declines in CGS yields have been attributed to unprecedented monetary easing by central banks and a shortage of risk-free assets as demand for these assets has increased. Frontier notes that at least some of these factors appear to be unique to the government bond market and therefore would not be expected to affect the return on private equity – for example, tighter banking regulations have increased the demand for government bonds but not equity, and the demand from foreign investors has been much more pronounced in the government bond market than the equity market.[215] Further, Frontier points to empirical evidence that the return on equity has not fallen in lockstep with the decline in government bond yields.[216]

1.6.4.2 Determination of the MRP

The AER's decision on the MRP

In the Draft Decision, the AER adopted a three-step approach to estimating the MRP:[217]

- In step one, the AER determined a 'baseline' estimate for the MRP, based on estimates of historical excess returns. The AER considered that the information on historical excess returns indicated a baseline estimate for the MRP of 6.0%. This baseline estimate was taken from a range of estimates of historical excess returns of 5.0% to 6.5%.[218]

- In step two, the AER had regard to DGM evidence in order to determine whether it should select an MRP point estimate above or below the baseline estimate of 6.0%. The AER's DGM estimates of the MRP ranged from 7.5% to 8.6% and its preferred three-stage estimates ranged from 7.7% to 8.6%.[219] The AER considered that this information could justify a point estimate above the 6.0% baseline, but did not support a point estimate above the top of the range implied by historical excess returns (6.5%).[220]

- In step three, the AER placed some reliance on survey evidence and conditioning variables. The AER considered that this information, in conjunction with DGM evidence, helps to indicate how far above or below the baseline estimate the MRP point estimate should be.

The effect of adopting this three-step approach is that critical evidence as to the prevailing MRP, from the AER's DGM model, has very little influence on the determination of the point estimate. This evidence is only used to indicate whether the prevailing MRP is likely to lie above or below the AER's "baseline" estimate of 6.0%, which reflects the AER's view of the historical average MRP. The estimates from the AER's DGM model do not appear to otherwise influence the AER's determination of the MRP. Ultimately, the AER's estimate of the prevailing MRP is based on historical average measures, and evidence as to the prevailing MRP is only used to determine which of the historical average measures is used.

AGN is concerned that the MRP estimate resulting from this approach will not reflect prevailing market conditions. The evidence before the AER (including from the AER's own DGM analysis) indicates that the prevailing MRP is not in line with the historical average. Despite this, the AER has tied its estimate of the MRP to the range of historical average measures. Measures of the prevailing MRP are only used to determine which historical average measure is to be used.

The AER's DGM estimates do not merely indicate that the MRP is somewhere above 6.0%. Rather, the AER's DGM estimates indicate that the current MRP is somewhere in the range of 7.5% to 8.6%. This evidence in no way confirms or supports the AER's estimate of 6.5%.

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215 Frontier, *The relationship between government bond yields and the market risk premium*, January 2016, pp28-29 (Attachment 10.33 to this Revised AA Proposal).
216 Frontier, *The relationship between government bond yields and the market risk premium*, January 2016, pp30-31 (Attachment 10.33 to this Revised AA Proposal).
217 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-435.
218 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-432 to 433.
219 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-366.
220 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-437.

It appears that the AER has incorrectly analysed the range for the historical average MRP as suggesting that the prevailing MRP could be found in this range, whereas all that this range indicates is that the MRP in average market conditions (i.e., the average of the market conditions over the historical period that was used) had a range of somewhere between 5.0% and 6.5%. Consequently, the AER fails to appreciate that the best estimate of the prevailing MRP need not fall within the statistical range of estimates for the historical average excess return – for example, if the contemporaneous market conditions differed from the historical average conditions because the risk-free rate was at unprecedented lows.

The AER also appears to have constrained its consideration of the appropriate MRP through this three-step approach. Through its consideration of historical excess return estimates in step one, the AER appears to have constrained the range of possible MRP outcomes to that indicated by its range of estimates for the historical average excess returns (5.0% to 6.5%). Consequently, the evidence considered under step two (the AER's DGM estimates) could only have an effect on the determination of the MRP to the extent that it confirmed an estimate within the range determined under step one. To the extent that this evidence indicated an estimate outside this range, it was given no weight, or its role was limited to taking the AER to the top of the range defined by step one.

Rigidity of the AER's MRP estimate, despite evidence of changes in market conditions

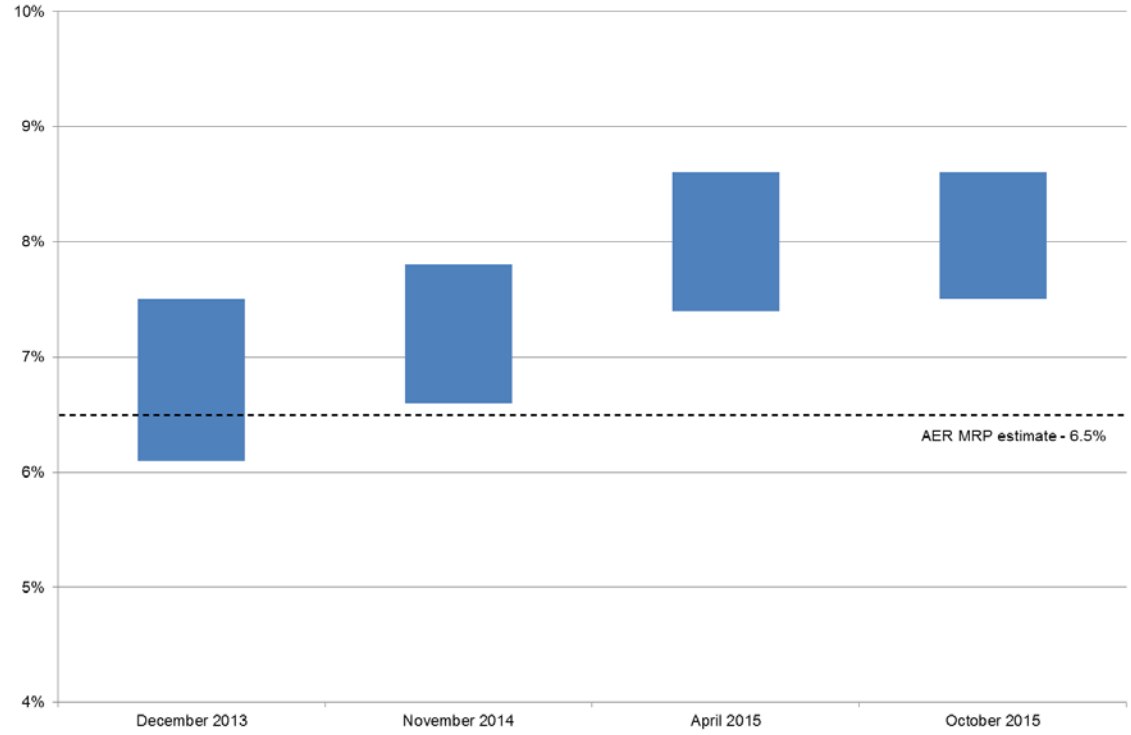
AGN notes that the AER's estimate of the MRP has not changed since publication of its Rate of Return Guideline, despite apparent changes in prevailing market conditions. The AER adopted an estimate for the MRP of 6.5% in its Rate of Return Guideline (December 2013), and has maintained the same MRP estimate in the draft and final decisions for the NSW electricity businesses (November 2014 and April 2015), in its Preliminary Decisions for the Victorian electricity distributors (October 2015) and in its Draft Decision (November 2015). The AER's view appears to be that there has been no change to the MRP between December 2013 and November 2015.

However the evidence before the AER indicates that there has been a significant change in market conditions over the past two years. In particular:

- Indicators of the forward-looking MRP – including the AER's own DGM results (as illustrated in Figure 4 below) – indicate that the MRP has increased significantly. Whereas at the time of the Rate of Return Guideline the AER's MRP estimate sat within the AER's range of DGM estimates, by the time of the Draft Decision, the AER's MRP estimate was well outside its range of DGM estimates. In December 2013 the AER estimated a range for the MRP of 6.1% to 7.5% from its DGM.[221] However, in the Draft Decision, this range is 7.5% to 8.6%.[222]

[221] AER, *Better Regulation: Explanatory Statement – Rate of Return Guideline*, December 2013, p93.
[222] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-366.

FIGURE 4: MOVEMENT IN AER DGM ESTIMATES SINCE RATE OF RETURN GUIDELINE



The fact that the AER's MRP has not changed despite significant increases in its DGM estimates suggests that either the AER is placing no real weight on DGM results, or the AER has placed declining weight on these results as the MRP estimate has increased. Giving either no weight or declining weight to DGM results would be unreasonable in circumstances where DGM results provide the best indicator of the current (prevailing) MRP. This implies that the AER is giving increasing weight to historical average measures of the MRP, which will not reflect prevailing market conditions except perhaps by chance (i.e. if, by chance, current market conditions reflect historical average conditions).

- There has been a precipitous fall in the risk-free rate – from around 4.2% at the time of the Rate of Return Guideline, to around 2.76% at the time of the Draft Decision. By holding the MRP constant, the AER implicitly assumes that the market conditions driving this reduction in CGS yields are:

  – not affecting the MRP at all; and

  – leading to a corresponding one-for-one reduction in the return on equity.

  As noted above, the evidence does not support such an assumption. Rather, the evidence from the AER's own DGM analysis indicates that the MRP has been increasing as the risk-free rate has been falling, and that as a result, the return on equity has not fallen in lock-step with the risk-free rate.

- As discussed below (in section 1.6.5), evidence from the AER's cross-check analysis and conditioning variables points to an increase in the MRP.

- It has been recognised by market practitioners and regulatory authorities that current market conditions are not average market conditions, and that the MRP is likely deviating from a fixed range based on historical average measures.

For example, the United States Federal Energy Regulatory Commission has noted:[223]

> *"Given the recent trends of near-historic low yields for long-term U.S. Treasury bond rates, the CAPM's input for the "risk-free" rate, we find that it is a reasonable assumption that the current equity risk premium (which is added to the risk-free rate to calculate the cost of equity data point that determines the slope of the CAPM curve) exceeds the 86-year historical average used as the consultants' CAPM input. The current low treasury bond rate environment creates a need to adjust the CAPM results, consistent with the financial theory that the equity risk premium exceeds the long-term average when long-term U.S. Treasury bond rates are lower than average, and vice-versa."*

Similarly in the UK, Ofgem has recognised that as the risk-free has fallen to historic lows, it is not appropriate to simply add a prevailing risk-free rate measure to a fixed ERP. Ofgem has instead used a risk-free rate range above the prevailing rate, resulting in more stability in estimates of the overall return on equity. Ofgem explains its approach as follows:[224]

> *"Market measures of the real risk-free rate, such as the yield on ILGs, have risen slightly since the data cut-off point for EE's December report. However, they remain near historical lows, partly due to the Bank of England's official interest rate being held at 0.5 per cent and the impact of Quantitative Easing. We, therefore, do not consider it appropriate to rely on spot rates or short-term averages to set the risk-free rate.*
>
> *Our revised range for the risk-free rate is, therefore, 1.7-2.0 per cent. The lower bound matches the 10-year average yield on 10-year ILGs, while the upper bound corresponds to regulatory precedent in the UK."*

The Reserve Bank of Australia has observed that the ERP appears to have risen as the risk-free has fallen in recent years. The RBA Governor observed in a recent speech:[225]

> *"…another feature that catches one's eye is that, post-crisis, the earnings yield on listed companies seems to have remained where it has historically been for a long time, even as the return on safe assets has collapsed to be close to zero... This seems to imply that the equity risk premium observed ex post has risen even as the risk-free rate has fallen and by about an offsetting amount."*

In an Australian regulatory context, the Economic Regulation Authority in WA (ERA) has recognised that the MRP will fluctuate over time, and that it is therefore not appropriate to fix a range for the MRP. The ERA noted in a recent decision:[226]

> *"…the Authority has now concluded that it is not reasonable to constrain the MRP to a fixed range over time. The erratic behaviour of the risk free rate in Australia to date, and more particularly, its pronounced decline in the current economic environment, leads to a situation where the combination of a fixed range for the MRP and prevailing risk free rate may not result in an outcome which is consistent with the achievement of the average market return on equity over the long run.*

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223 Federal Energy Regulatory Commission, Order accepting tariff filing subject to condition and denying waiver, Docket No. ER14-500-000, 28 January 2014, p36.

224 Ofgem (2011), *Decision on strategy for the next transmission and gas distribution price controls – RIIO-T1 and GD1 Financial issues*, p33. See also: Oxera, *Agenda – Advancing economics in business – What WACC for a crisis?*, February 2013, for a review of recent UK regulatory decisions on this issue.

225 Glenn Stevens, 'The World Economy and Australia', Address to The American Australian Association luncheon, hosted by Goldman Sachs, New York, USA, 21 April 2015.

226 ERA, *Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems submitted by ATCO Gas Australia Pty Ltd*, 30 June 2015 (as amended on 10 September 2015), p251.

> *Specifically, the estimate of the upper bound for the forward looking MRP of 7.5 per cent that was based on the DGM will fluctuate in line with the risk free rate. So for example, at times when the risk free rate is low, as it currently is, the upper bound for the MRP should be higher. There will be times – such as during the GFC – when the Authority would be more likely to select a point estimate of the MRP which is close to the upper bound. The resulting required return on the market in that type of situation could possibly exceed the long run average return on equity indicated by the historical data.*
>
> *For this reason the Authority considers it appropriate to determine a range for the MRP at the time of each decision."*

The approach taken in AGN's proposal to estimating the MRP takes into account changes in prevailing market conditions. Each of the estimation methodologies can be updated for recent data in order to derive a current estimate of the MRP.

However AGN is concerned that the AER's methodology is not similarly responsive to changes in market conditions. This is likely to be due to the fact that, as discussed below, the AER's approach fails to take into account a number of relevant estimation methodologies which will provide an indication of current market conditions, such as the Wright approach and evidence from independent expert reports.

Errors in interpretation of key evidence

The AER's conclusion on the MRP is also affected by errors in the interpretation of key evidence.

(A) Historical excess returns

The AER refers to a range for the historical average MRP of 5.0% to 6.5%, based on a combination of geometric and arithmetic average measures.

There are two problems with the AER's interpretation of the historical data:

- firstly, the AER has mixed geometric average measures with arithmetic averages, in addition to mixing estimates for different time periods. Expert advice, including advice from NERA and Lally, explains why geometric averages are not an appropriate measure in this case. As explained by NERA, since estimates of the MRP are not compounded, arithmetic mean measures should be used;[227]

- secondly, the AER has relied on estimates from Brailsford, Handley and Maheswaran which rely on an historical dataset that has been inappropriately adjusted to take account of perceived deficiencies in the original dataset. These adjustments have been investigated by NERA and the adjustments to the original dataset corrected. This issue was addressed in the expert reports from NERA accompanying AGN's Initial AA Proposal. The key issue is that the adjustment originally made to the historical data appears to have had no logical basis. It follows that an examination of earlier data extracted from original sources (as has been done by NERA) will almost surely lead to an adjustment that is more accurate than the one contained in the data that Brailsford, Handley and Maheswaran employ.[228]

Based on a correct interpretation of the historical data and with appropriate adjustments for imputation, the historical average MRP based on the longest available dataset is 6.56% (based on a theta of 0.35).[229] AGN

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227 NERA, *Historical Estimates of the Market Risk Premium*, February 2015, section 2 (Attachment 10.9 to AGN's Initial AA Proposal).

228 NERA, *Historical Estimates of the Market Risk Premium*, February 2015 (Attachment 10.9 to AGN's Initial AA Proposal); NERA, *Further Assessment of the Historical MRP: Response to the AER's Final Decisions for the NSW and ACT Electricity Distributors*, June 2015 (Attachment 10.18 to AGN's Initial AA Proposal).

229 NERA, *Historical Estimates of the Market Risk Premium*, February 2015, p42 (Attachment 10.9 to AGN's Initial AA Proposal).

notes that, if the AER's theta estimate of approximately 0.6 were to be adopted, this MRP estimate would increase slightly, to 6.65%.[230]

(B) The AER has incorrectly used the Wright approach

The AER does not take into account the Wright approach when estimating the MRP, because it considers that the Wright approach should inform the overall return on equity only. The AER refers to the Wright approach as an alternative implementation of the SL CAPM designed to provide information at the return on equity level.[231]

This is an incorrect interpretation of Wright's work. Wright did not develop an alternative implementation of the SL CAPM. Wright simply proposed an alternative method of estimating the MRP for use in the SL CAPM – as the difference between the historical average market return and the current risk free rate – on the basis that market returns may be more stable over time than excess returns.[232]

Associate Professor Handley, in a passage referred to in the Draft Decision, clearly describes the Wright approach as an alternative method of estimating the MRP, rather than as an alternative return on equity model. Handley describes the Wright approach as follows:[233]

> *"Wright adopts an alternative non-standard approach to estimating the MRP. Rather than treating the MRP as a distinct variable he suggests estimating the return on the market – by estimating the real return on equity and combining this with a current forecast of inflation to give an estimated nominal return on equity – and the risk free rate separately."*

In the Draft Decision, the AER sets out a formula, which it says represents the Wright approach to implementing the SL CAPM (referred to as the 'Wright SLCAPM').[234] However the formula set out by the AER is simply the standard SL CAPM, as originally specified by Sharpe and Lintner.[235] It is clear from this that the Wright approach does not involve an alternative model for estimating the overall return on equity. Rather, the Wright approach represents an alternative method for estimating the MRP parameter.

In fact, the Wright approach to estimating the MRP would appear to be more aligned with the conventional SL CAPM specification, because it seeks to estimate the MRP as the difference between two distinct parameters (the market return and risk-free rate). This is in contrast to other methods which seek to estimate the MRP as a parameter in its own right.

It is therefore incorrect for the AER to reject the Wright approach on the basis that it is not a measure of the MRP. The Wright approach clearly provides relevant information in relation to the required market return and the MRP, and it would be an error for the AER to disregard it when estimating the MRP.

(C) Use of independent valuation reports

The AER considers independent valuation reports to be relevant, but only to assessing the overall return on equity. Further, due to perceived limitations, the AER considers that only "limited reliance" should be placed on this material, and that it should be used in a "directional role" only.[236]

Ultimately it is not clear what practical effect, if any, independent valuation reports have on the AER's decision on the return on equity. As a consequence of their relegation to an overall return on equity "check" role, they appear to have little or no practical impact on the final estimate. The AER retains its original parameter estimates and model choice once it completes its cross-check against the results of independent expert reports.

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230 NERA, *Historical Estimates of the Market Risk Premium*, February 2015, p43 (Attachment 10.9 to AGN's Initial AA Proposal).
231 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg.3-34.
232 Wright, S., *Review of Risk Free Rate and Cost of Equity Estimates: A Comparison of U.K. Approaches with the AER*, 25 October 2012.
233 John C Handley, *Advice on the Return on Equity*, 16 October 2014, p 17; Draft Decision, p 3-88.
234 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg.3-85 to 86.
235 Sharpe, W., 1964, "Capital asset prices: A theory of market equilibrium under conditions of risk," *Journal of Finance*, 19, 425-442.
236 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg.3-96.

AGN considers that independent valuation reports provide relevant evidence of the required market return and MRP applied by market practitioners. Therefore, evidence from these reports as to the MRP applied by market practitioners should be given a direct role in estimating the MRP.

Incenta's February 2015 analysis of independent expert reports indicates that the market rate of return estimated by independent experts has remained relatively constant in recent times, notwithstanding declines in the 'spot' risk free rate.[237] This implies that the MRP used in these reports, and/or the uplifts used by independent experts, has increased as the risk-free rate has declined.

This is consistent with evidence presented by the AER in the Draft Decision.[238] As noted above, the AER's analysis of independent expert reports (Figure 3-33 of the Draft Decision) indicates that as the risk-free rate has fallen over the past two years, estimates of the market return in independent expert reports has remained relatively steady at around 11% (adjusted for imputation). This can be contrasted with the AER's estimate of the market return, which has declined to around 9%, moving in lock-step with changes in the risk-free rate.

These findings are supported by more recent analysis from HoustonKemp. As noted above, HoustonKemp observes that in recent times a number of independent experts have used risk-free rates above the prevailing CGS yield, leading to more stability in their estimates of the prevailing market return (and implicitly higher MRP assumptions) than under the AER's approach.[239]

HoustonKemp identifies a statistically significant negative relationship between the implied MRP estimated by experts (their implied estimate of the market return, less the prevailing CGS yield) and the prevailing CGS yield.

Based on their analysis of recent independent expert reports, HoustonKemp estimates an implied MRP from these reports of 7.58%.[240]

(D) Use of DGM estimates

The AER adopts a different construction of the DGM to that used by SFG/Frontier Economics, and as a result derives a wider range of estimates for the market return and MRP.

SFG/Frontier has clearly explained each of the points of difference between its approach and the AER's, and explains why it has taken the approach that it has.[241] In particular, SFG/Frontier clearly explains the reasons for its choice of long term growth assumption, its estimation approach and dataset. For the reasons set out in SFG's report, AGN considers that the SFG/Frontier approach to implementing the DGM is clearly preferable to the AER's.

However even adopting the AER's preferred construction of the DGM, it is clear that the MRP has increased significantly over the past two years. Table 5 below shows the change in the MRP from the AER's DGM between the Rate of Return Guideline (December 2013) and the Draft Decision (November 2015).

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237 Incenta, *Further update on the required return on equity from independent expert reports*, February 2015 (Attachment 10.11 to AGN's Initial AA Proposal).

238 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg.3-541.

239 HoustonKemp, *The Cost of Equity: Response to the AER's Draft Decisions for the Victorian Electricity Distributors, ActewAGL Distribution and Australian Gas Networks*, January 2016, p43 and Figure 7 (Attachment 10.32 to this Revised AA Proposal).

240 HoustonKemp, *The Cost of Equity: Response to the AER's Draft Decisions for the Victorian Electricity Distributors, ActewAGL Distribution and Australian Gas Networks*, January 2016, p48 (Attachment 10.32 to this Revised AA Proposal). This estimate is inclusive of a value assigned to imputation credits distributed, where it is assumed that theta is 0.35. HoustonKemp notes that if a higher theta value were to be assumed, its estimate of the MRP based on this analysis would be higher (assuming theta of 0.6 leads to an estimate of 8.02%). HoustonKemp's estimate of 7.58% is exclusive of any final revisions or adjustments made by independent experts. If revisions/adjustments are included, the estimate would be higher (HoustonKemp's estimate increases to 7.94% if these revisions/adjustments are included).

241 SFG, *Share prices, the dividend discount model and the cost of equity for the market and a benchmark energy network*, February 2015 (Attachment 10.7 to AGN's Initial AA Proposal).

TABLE 5: AER DIVIDEND GROWTH MODEL ESTIMATES OF THE REQUIRED RETURN ON THE MARKET

	Growth rate	Two stage model	Three stage model
Guideline	4.0%	6.1%	6.7%
	4.6%	6.7%	7.1%
	5.1%	7.1%	7.5%
Draft Decision	4.0%	7.5%	7.7%
	4.6%	8.1%	8.2%
	5.1%	8.5%	8.6%

Source: AER Rate of Return Guideline Appendices, p87; Draft Decision, p3-366.

Frontier's estimate of the prevailing MRP (discussed below) uses the AER's DGM estimate based on its preferred three-stage model and the mid-point of its range of growth rate assumptions. This estimate is currently 8.2%, as shown in Table 6 below.

Conclusion on the MRP

For the above reasons, AGN does not agree with the AER's estimate for the MRP of 6.5%. This estimate does not reflect prevailing conditions in the market for equity funds and will not contribute to the achievement of the ARORO. The AER's decision on the MRP is affected by a number of errors, as described above.

AGN considers that a preferable approach is that set out by Frontier Economics. This approach takes into account all relevant evidence on the MRP and applies a transparent weighting to each estimate based on the relative strengths and weaknesses of each estimation approach. The reasons for Frontier's weighting approach are set out in an expert report by SFG referred to in AGN's Initial AA Proposal.[242]

Importantly, Frontier's approach gives greatest weight to measures of the prevailing (current) MRP. This is in contrast to the AER's approach which leads to an MRP estimate that reflects an historical average measure.

Frontier has now updated its estimate of the MRP based on current data. Frontier's revised estimate is set out in Table 6 below.

TABLE 6: FRONTIER ESTIMATES OF MARKET RISK PREMIUM[243]

Estimation method	Market return	MRP	Weighting
Historical excess returns (Ibbotson)	9.18%	6.50%	20%
Historical real market returns (Wright)	11.35%	8.67%	20%
Dividend discount model	10.88%	8.20%	50%
Independent expert reports	10.27%	7.59%	10%
Weighted average	10.57%	7.89%	100%

1.6.4.3 Equity beta estimate

The AER concludes that an equity beta of 0.7, when applied in the SL CAPM, will deliver a return on equity that contributes to achievement of the ARORO. The AER finds that:

[242] SFG, *The required return on equity for regulated gas and electricity network businesses*, June 2014.

[243] Frontier, *An updated estimate of the required return on equity*, January 2016, Table 2 (Attachment 10.31 to this Revised AA Proposal). The risk-free rate assumed in these calculations is a placeholder estimate of 2.68%, based on an October 2015 averaging period.

- the primary range for the equity beta should be based on analysis of Australian regulated energy businesses only;
- based on analysis of this sample, a reasonable range for the equity beta is 0.4 to 0.7;
- the "*best empirical estimate*" of the equity beta is 0.5; and
- additional information taken into account by the AER – specifically empirical estimates for international energy networks and the theoretical principles underpinning the Black CAPM – indicate that an equity beta at the top of this range is appropriate, and will overcome any bias in the SL CAPM.

This section addresses each of these findings.

The AER has erred in confining the sample to Australian regulated businesses

The AER's primary range for the equity beta is based on analysis of a very small data sample comprising listed Australian energy network businesses only. This sample includes nine businesses, of which just four are currently trading.

It is neither necessary nor appropriate to confine the sample used for estimating equity beta to regulated energy network businesses only. As discussed in section 1.4.2 above, the relevant degree of risk under the ARORO is that faced by entities operating in a workably competitive market providing services similar to reference services within Australia. Therefore, in constructing comparator datasets for the purposes of estimating a return on equity that is commensurate with efficient financing costs of a BEE, these datasets should include entities operating in workably competitive markets that face a similar degree of risk to that faced in the provision of reference services. That is, they should not be restricted to regulated entities.

Even if the relevant level of risk is that of a regulated energy network business subject to economic regulation under the NGR/NGL (and NER/NEL), in many cases it will be necessary to look beyond just those businesses that supply regulated energy network services within Australia in order to produce sufficiently large datasets for robust estimation of risk parameters. For reasons discussed below, this is most clearly the case in relation to the equity beta.

A sample of nine regulated energy network businesses is very small. However the fact that five of these businesses are no longer trading creates further problems, since the data for these non-trading businesses becomes 'stale' over time. The equity beta estimates for these non-trading businesses will reflect the risks faced by those businesses in the past, not the risks currently faced by a BEE. As noted in AGN's Initial AA Proposal, the level of risk faced in the supply of energy network services is changing, with businesses facing new operational risks arising from disruptive technologies. This change in risk profile is discussed in the accompanying expert report of Frontier Economics.[244]

The expert evidence before the AER demonstrates that the sample used by the AER is too small to provide statistically reliable estimates. Analysis by SFG demonstrates that:[245]

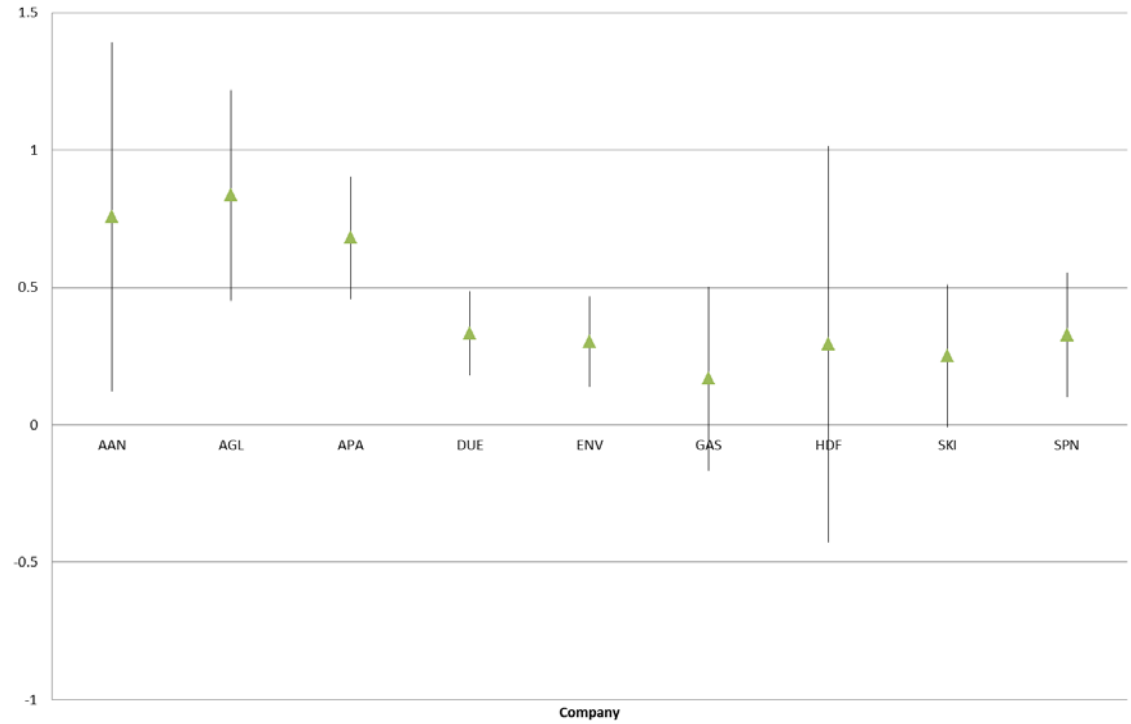
[244] Frontier, *Review of the AER's conceptual analysis for equity beta*, June 2015, section 3 (Attachment 10.13 to AGN's Initial AA Proposal).

[245] SFG, *Regression-based estimates of risk parameters for the benchmark firm*, 24 June 2013 (http://www.aer.gov.au/system/files/Ausgrid%20-%207.19%20-%20Regression-based%20estimates%20of%20risk%20parameters%20for%20the%20benchmark%20firm%20-%202014.pdf).

- Professor Henry's estimates based exclusively on the small sample of domestic energy network businesses are statistically unreliable.[246] SFG and Frontier note that the estimates are imprecise with wide standard errors, the estimates span a wide range, and that the results were sensitive to the choices of estimation method, sampling frequency and time period.[247] Figure 5 below shows the wide confidence intervals around Professor Henry's estimates, and the wide range of individual company estimates based on just one methodology and sampling technique. Professor Henry reports some evidence of instability in his study based on Australian data only, possibly due to the small sample size;[248] and

- increasing sample size significantly reduces the dispersion of estimates. Previous analysis by SFG (2013) and Brooks, Diamond, Gray and Hall (2013) demonstrated that increasing sample size from nine to 18 firms is likely to reduce the dispersion of risk estimates by about one-third, and increasing sample size further to 27 firms is likely to reduce this estimation error by half.[249]

FIGURE 5: CONFIDENCE INTERVALS AROUND HENRY (2014) ESTIMATES (OLS ESTIMATES BASED ON MONTHLY SAMPLING OVER THE LONGEST AVAILABLE TIME PERIOD)



AGN notes that there is no expert evidence recommending or supporting the use of such a limited sample. Professor Henry does not recommend use of the limited sample, but rather was instructed by the AER to use it.[250] The only expert evidence on this point is that of SFG and Frontier recommending a broader sample.[251]

AGN has previously urged the AER to adopt a broader sample for estimating equity beta, based on expert advice from SFG. In its initial proposal, AGN adopted an equity beta estimate based on a sample including

246 SFG, *Beta and the Black Capital Asset Pricing Model*, February 2015, [31] (Attachment 10.8 to AGN's Initial AA Proposal).
247 SFG, *Beta and the Black Capital Asset Pricing Model*, February 2015, [31] (Attachment 10.13 to AGN's Initial AA Proposal); Frontier, *Estimating the equity beta for the benchmark efficient entity*, January 2016, pp12-15 (Attachment 10.35 to this Revised AA Proposal).
248 Olan T Henry, *Estimating β: An update*, April 2014, p62.
249 SFG, *Regression-based estimates of risk parameters for the benchmark firm*, 24 June 2013, p9; Brooks, R., N. Diamond, S. Gray and J. Hall, *Assessing the reliability of regression-based estimates of risk*, 17 June 2013 (http://www.aer.gov.au/system/files/Ausgrid%20-%207.24%20-%20Gray%20et.%20al.%20-%20Assessing%20the%20reliability%20of%20regression-based%20estimates%20of%20risk%20-%2017%20June%202013.pdf).
250 Olan T Henry, *Estimating β: An update*, April 2014, p4.
251 SFG, *Regression-based estimates of risk parameters for the benchmark firm*, 24 June 2013; SFG, *Beta and the Black Capital Asset Pricing Model*, February 2015 (Attachment 10.8 to AGN's Initial AA Proposal); Frontier, *Estimating the equity beta for the benchmark efficient entity*, January 2016 (Attachment 10.35 to this Revised AA Proposal).

both Australian and US energy network businesses. In compiling this broader sample, due consideration had been given by CEG[252] (who constructed the international sample used by SFG) and SFG to the comparability of international businesses. SFG concluded that the businesses included in its sample are sufficiently comparable to the BEE such that they can be appropriately used as part of the dataset to estimate the equity beta range.[253] Further analysis by Frontier, in a report accompanying this Revised AA Proposal, shows that the Australian and US samples are sufficiently similar that they can be grouped together for the purposes of statistical analysis.[254] Frontier also shows that, due to the larger size of the US sample and greater stability in its composition, there is greater congruency between mean and portfolio estimates from this sample, as well as lower standard errors and tighter confidence intervals.[255]

An additional way to expand the data sample would be to include other comparable Australian businesses outside the energy network sector. The sample could be expanded to include businesses operating in other sectors that face a similar degree of risk to energy network businesses, such as telecommunications and transport businesses.

Expanding the sample to include businesses outside the energy sector would be consistent with AGN's interpretation of the ARORO, as set out above. Inclusion of businesses from the telecommunications and transport sectors would ensure that the equity beta reflects the degree of risk faced by entities operating in a workably competitive market providing services similar to reference services within Australia.

Such an approach would also be consistent with a narrower definition of the BEE, such as that adopted by the AER. Even if the relevant level of risk is that of a regulated energy network business subject to economic regulation under the NGL, in this case it is clearly necessary to look beyond just those businesses that supply regulated energy network services within Australia in order to produce a sufficiently large datasets for robust estimation of the equity beta. Thus, it is necessary to expand the data sample to include businesses in other sectors that face a similar degree of risk to that faced by energy network business subject to economic regulation under the NGL.

In the accompanying expert report from Frontier Economics, analysis is conducted on a broader sample of listed Australian infrastructure businesses. The businesses included by Frontier include listed transport and logistics businesses (e.g. Aurizon, Asciano and Sydney Airport) and telecommunications businesses (e.g. Telstra). Frontier's statistical tests confirm that these listed infrastructure businesses are sufficiently comparable to the AER's sample of energy network businesses, such that it is appropriate to group this broader set of Australian infrastructure firms together.[256]

Frontier notes that expanding the sample to include other listed Australian infrastructure businesses improves the statistical properties of the resulting equity beta estimates – the estimates based on the broader domestic sample are more stable and more precise.[257] However, Frontier concludes that the expanded set of domestic firms should not be relied upon alone, given the ready availability of international comparators. It is Frontier's recommendation that the equity beta estimate be based on a broader dataset that includes both relevant domestic comparators and international businesses.[258]

It is common practice for regulators to use samples that include businesses outside of the sector and/or country that the regulated business operates in, in recognition of the fact that samples confined to that business' sector and/or country may be too small. For example:

- in estimating the equity beta for Telstra, the ACCC uses a sample of 22 international telecommunications businesses, including US, European and Asian businesses;[259]

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252 CEG, *Information on equity beta from US companies*, June 2013 (http://www.aer.gov.au/system/files/Ausgrid%20-%207.20%20-%20CEG%20-%20Information%20on%20equity%20beta%20from%20US%20companies-%202014.pdf).

253 SFG, *Regression-based estimates of risk parameters for the benchmark firm*, 24 June 2013, p 0.

254 Frontier, *Estimating the equity beta for the benchmark efficient entity*, January 2016, p30 (Attachment 10.35 to this Revised AA Proposal).

255 Frontier, *Estimating the equity beta for the benchmark efficient entity*, January 2016, p31 (Attachment 10.35 to this Revised AA Proposal).

256 Frontier, *Estimating the equity beta for the benchmark efficient entity*, January 2016, pp23-24 (Attachment 10.35 to this Revised AA Proposal).

257 Frontier, *Estimating the equity beta for the benchmark efficient entity*, January 2016, p34 (Attachment 10.35 to this Revised AA Proposal).

258 Frontier, *Estimating the equity beta for the benchmark efficient entity*, January 2016, p34 (Attachment 10.35 to this Revised AA Proposal).

259 ACCC, *Public inquiry into final access determinations for fixed line services: Final Decision*, October 2015, pp80-83.

- in estimating the equity beta for rail operator Aurizon Network, the QCA relies on analysis of a sample of 70 energy and water businesses, including a large number of international businesses;[260] and

- in estimating the equity beta for electricity distribution businesses the Commerce Commission in New Zealand relies on a sample of firm that includes a number of international utilities.[261]

In this case, given the paucity of data for Australian energy network businesses, the sample must be expanded to include US energy network businesses and/or other Australian infrastructure businesses. Without the inclusion of these additional comparators, estimates of the equity beta for the BEE will be statistically unreliable.

The AER has erred in its determination of the equity beta range

The AER considers that "*the equity beta estimates presented in Henry's empirical analysis support a range of 0.4 to 0.7*" and that other empirical studies show "*an extensive pattern of support*" for an equity beta within a range of 0.4 to 0.7.[262]

However Professor Henry, in his report for the AER, does not recommend a range for the equity beta of 0.4 to 0.7. Rather, Professor Henry concludes, based on his analysis of Australian energy network data only, that the point estimate for beta is likely to lie in the range of 0.3 to 0.8.[263]

The AER's conclusion is based on the fixed weight portfolio estimates and the average of individual firm estimates in Professor Henry's report.[264] However relying on these measures alone is likely to be misleading as to the precision of Professor Henry's estimates, including because:

- firstly, the AER's conclusion from the individual firm estimates is based on a simple average of the estimates for each firm, with the AER's range from this measure (0.46 to 0.56) simply reflecting the dispersion of average measures based on different time periods.[265] Thus, what the AER relies on is not an empirical estimate, but rather an average of estimates for individual firms. These individual firm estimates vary widely, from 0.2 to 1.0,[266] and thus a simple average is largely meaningless; and

- secondly, the AER places significant weight on Professor Henry's portfolio estimates. However Professor Henry was not asked to provide expert advice on the rationale for preparing the portfolios, and it is not clear what the basis for formation of these portfolios was.[267]

Professor Henry's report in fact produces a very wide range of estimates for the equity beta, with some individual firm estimates in the range of 0.8 to 1.0 and confidence intervals around these estimates even wider, from -0.4 to 1.4 (at the 95% confidence level). As noted by SFG, the estimates vary widely depending on the chosen estimation method, sampling frequency and time period.[268]

Further, as explained above, the sample used by Professor Henry to estimate equity beta is too small to provide reliable estimates. As a result, a reliable equity beta range cannot be derived from this sample alone.

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260 QCA, *Draft Decision: Aurizon Network 2014 Draft Access Undertaking – Maximum Allowable Revenue*, September 2014, pp248-249; Incenta, *Review of Regulatory Capital Structure and Asset / Equity Beta for Aurizon Network: Report to the Queensland Competition Authority*, 9 December 2013.

261 See, for example: Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services): Reasons Paper*, December 2010, section 6.5 and Appendix H8.

262 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-484, 490.

263 Olan T Henry, *Estimating β: An update*, April 2014, p63.

264 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-484.

265 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-484.

266 Olan T Henry, *Estimating β: An update*, April 2014, Tables 2 and 5.

267 Olan T Henry, *Estimating β: An update*, April 2014, p36.

268 SFG, *Beta and the Black Capital Asset Pricing Model*, February 2015, [31] (Attachment 10.8 to AGN's Initial AA Proposal).

Evidence from wider samples supports an equity beta higher than 0.7. The evidence from Frontier Economics, SFG and CEG, based on a larger sample including international businesses, indicates an equity beta of at least 0.82.

The AER's view as to the "best empirical estimate" is not supported by evidence

There does not appear to be any evidence for the AER's statement that "*the best empirical estimate*" of the equity beta is 0.5.

Professor Henry does not recommend that a value of 0.5 be adopted, nor does his report refer to 0.5 as the "*best empirical estimate*". Rather, as noted above, Professor Henry recommends a range of 0.3 to 0.8, based on his analysis of Australian data only.[269]

Indeed, no expert concluded that the best empirical estimate of the equity beta is 0.5. Rather, the expert evidence supported an equity beta of at least 0.8.[270]

As noted above, the AER's conclusion as to the range and "*best empirical estimate*" for beta are based on its analysis of the fixed weight portfolio estimates and the average of individual firm estimates in Professor Henry's report.[271] However, for reasons set out above, the analysis underpinning these conclusions is unsound.

The only experts that have been asked to opine as to the best estimate of the equity beta are SFG and Frontier. SFG's and Frontier's advice is that in order to arrive at a reliable estimate of the equity beta, a sample broader than that given to Professor Henry must be used. SFG and Frontier recommend an equity beta estimate of 0.82 based on a broader sample including both Australian and international businesses.[272]

The AER's adjustment to the "best empirical estimate" is arbitrary

The AER states that the theory of the Black CAPM points to an estimate of the SL CAPM beta that is above the best estimate indicated by Professor Henry's analysis. This appears to be the reason for the AER's adjustment from the "*best empirical estimate*" of 0.5 to a final point estimate of 0.7.

AGN understands that what the AER is seeking to make is an adjustment to the equity beta to account for the SL CAPM bias that is indicated by Black CAPM theory. That is, while Black CAPM theory does not say anything about adjusting the equity beta to account for SL CAPM bias, this parameter is being used by the AER as the adjustment tool to account for this bias.

However in this case the adjustment made to the AER's "*best empirical estimate*" of beta is highly arbitrary. The AER cannot reasonably be satisfied that adjusting the equity beta estimate from 0.5 to 0.7 will adequately account for bias in the SL CAPM, because it has not sought to quantify the effect of this bias.

AGN agrees that, if the SL CAPM is to be used alone to estimate the return on equity, some adjustment needs to be made to its input parameters to account for the known weaknesses of the model. If the SL CAPM is used without any adjustment, the empirical evidence shows that the return on equity for low-beta stocks will be significantly under-estimated.

AGN's concern is that the AER's adjustment to the equity beta is not sufficient to account for the shortcomings in the AER's implementation of the SL CAPM. In particular, it is clear that choosing the top of the AER's equity beta range is not sufficient to address the SL CAPM's low-beta bias, nor does it address the statistical reliability issues associated with the small sample used by the AER to estimate the equity beta. As shown in 1.6.3.2 above, it is clear that choosing the top of the AER's equity beta range will not correct for the low-beta bias in the SL CAPM indicated by Black CAPM theory – if the AER's parameter estimates are used in the Black CAPM along with the best available estimate of the zero-beta premium, the return on

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269 Olan T Henry, *Estimating β: An update*, April 2014, p63.
270 SFG, *Beta and the Black Capital Asset Pricing Model*, February 2015, section 4 (Attachment 10.8 to AGN's Initial AA Proposal).
271 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-484.
272 Frontier, *Estimating the equity beta for the benchmark efficient entity*, January 2016, p34 (Attachment 10.35 to this Revised AA Proposal).

equity estimated by the Black CAPM is above the return on equity estimated by the AER using the SL CAPM (see Table 4 above).

Indeed the AER acknowledges that it does not know by how much it needs to adjust its equity beta estimate to account for the issues indicated by Black CAPM theory – i.e. the effects of low-beta bias in the SL CAPM. The AER notes that "*while the direction of this effect may be known, the magnitude is much more difficult to ascertain*".[273] Since the AER does not estimate the Black CAPM, it cannot make a proper adjustment.

The size of the AER's adjustment is ultimately driven by the width of its equity beta range, rather than by an empirical analysis of the adjustment required to address the SL CAPM's weaknesses. Since the AER caps its range at 0.7, the adjustment to the equity beta can take the point estimate no higher than 0.7. Of course, if the AER had adopted the recommendation of its consultant for an equity beta range of 0.3 to 0.8, its adjustment to account for Black CAPM theory and international evidence would have taken the point estimate to 0.8. Thus, the problem of arbitrariness in the AER's adjustment is compounded by the error in its construction of the equity beta range.

In this Revised AA Proposal, AGN puts forward an alternative method for estimating the return on equity using the SL CAPM alone, with an empirically based adjustment to account for the known weaknesses of this model. This alternative method is explained in section 1.6.6 below and the accompanying expert report from Frontier Economics.

1.6.5 Reasonableness of the overall outcome

1.6.5.1 The AER's cross-check analysis

The AER considers that its return on equity estimate is broadly supported by:

- estimates using the Wright approach;
- estimates of the return on equity and ERP from independent valuation reports;
- the ERP range from the recent Grant Samuel valuation report for Envestra;
- estimates of the return on equity and ERP from recent broker reports; and
- estimates from other regulators.

In fact, when properly interpreted, these cross-checks do not support the AER's return equity estimate. These cross-checks actually demonstrate that the AER's estimate of the return on equity is below that required to promote efficient investment in, and efficient use of natural gas services for the long term interests of consumers.

Use of the Wright approach to support the AER's ERP estimate

As noted above, AGN considers that the AER has misinterpreted and misapplied the work of Professor Wright. Wright did not develop an alternative implementation of the SL CAPM for checking of the overall return on equity. Rather, Wright developed an alternative method for estimating the MRP.

Further, the way in which the AER has developed its ERP range from the Wright approach means that this 'cross-check' will almost certainly support the AER's ERP estimate. The AER derives a wide range of estimates from the Wright approach by using an equity beta range of 0.4 to 0.7 and a market return range of 10.0% to 12.7%.[274] The AER then checks the reasonableness of its ERP estimate by confirming that it falls within the broad range of estimates derived from the Wright approach.

[273] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-502.
[274] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-516.

Clearly if the AER had used its chosen point estimate of beta in applying the Wright approach, this cross-check would not support the AER's return on equity and ERP estimates (see Table 7 below). Even if the AER's lower bound value for the market return from the Wright approach were to be adopted, the resulting return on equity would be above that allowed by the AER (7.8%, compared to 7.3% allowed by the AER). If a midpoint or upper bound value for the market return were to be taken from the Wright approach, the resulting return on equity and ERP would be significantly higher than that allowed by the AER.

TABLE 7: ESTIMATES OF THE RETURN ON EQUITY AND ERP USING THE WRIGHT APPROACH[275]

Approach to estimating the ERP	ERP estimate	Return on equity estimate
AER approach (equity beta 0.7; MRP 6.5%)	4.55%	7.3%
Wright approach with lower bound R_m estimate (equity beta 0.7; R_m 10.0%)	5.07%	7.8%
Wright approach with midpoint Re estimate (equity beta 0.7; R_m 11.35%)	6.01%	8.8%
Wright approach with upper bound R_m estimate (equity beta 0.7; R_m 12.7%)	6.96%	9.7%

Independent valuation reports

The AER refers to estimates of the return on equity and ERP from independent valuation reports.

AGN agrees that evidence from independent valuation reports provides an important reasonableness check on the AER's estimate of the required return on equity. These reports provide market evidence of the return on equity required by investors.

However, for reasons set out below, AGN considers that this important market evidence has been misinterpreted by the AER. When properly interpreted, this evidence demonstrates that the AER's estimate of the return on equity is below that required by the market to promote efficient investment.

Most obviously, the independent valuation reports surveyed by the AER do not support the reasonableness of the AER's overall return on equity estimate. As noted by the AER, the range of imputation-adjusted estimates of the return on equity set out in these reports is 8.98% to 14.67%.[276] This compares to the AER's estimate of 7.3%.

This evidence also does not support the AER's ERP estimate, contrary to the conclusion of the AER in the Draft Decision. The AER states that its range of imputation-adjusted estimates for the ERP (a range of 3.72% to 11.67%) is based on the 18 independent valuation reports identified in Table 3-20 of the TransGrid draft decision.[277] However after reviewing Table 3-20 of the TransGrid draft decision, it is unclear to AGN how the AER has arrived at its ERP range.

An abridged version of Table 3-20 from the TransGrid draft decision is set out as Table 8 below. What this shows is that:

- the imputation-adjusted ERP in all but two of the surveyed reports is at least 5% - well above the ERP determined by the AER (4.55%);

[275] Estimates of the market return are the AER's estimates, as set out in Table 3-61 of the Draft Decision. All calculations are based on a risk-free rate of 2.76%.

[276] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-523.

[277] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-522, footnote 1997.

- the imputation-adjusted ERP from the Grant Samuel report for Envestra (discussed below) is quoted as 4.47%. However this appears to be based on the midpoint of Grant Samuel's range of SL CAPM values, with none of the uplift used by Grant Samuel. As discussed below, a fundamental aspect of Grant Samuel's analysis was to conclude that the calculated SL CAPM return on equity was not an appropriate benchmark and understated the required rate of return on equity, and this was one reason why Grant Samuel applied an uplift to its SL CAPM-based estimates. Incenta notes that on a correct interpretation of this report, the relevant range for the ERP is 5.27% to 5.37%, exclusive of any uplift for the value of imputation credits.[278] This clearly does not support the AER's ERP estimate; and

- the only other report with an imputation-adjusted ERP less than 5% is more than ten years old (the 2003 Deloitte report for United Energy). The return on equity and ERP estimate in this report cannot be said to be indicative of current practitioner views as to the required return on equity or ERP.

Of the 20 independent valuation reports referred to by the AER which have been published in the last decade, none of these actually used an ERP estimate below 5% (adjusted for imputation). Excluding the 2003 Deloitte report, and using the correct range of estimates from the Grant Samuel Envestra report, the ERP range from this evidence is approximately 5% to 5.8% (based on the reports in Table 3-20 of the TransGrid draft decision). Therefore, this market evidence clearly does not support the AER's ERP estimate.

TABLE 8: INDEPENDENT VALUATION REPORTS SURVEYED BY THE AER

Report date	Business	Valuer	Return on equity (imputation adjusted)[279]	ERP (imputation adjusted)
20/02/1998	Allgas Energy	Ernst & Young	n/a	n/a
19/03/1999	United Energy	SG Hambros	n/a	n/a
5/04/2003	GasNet	Sumner Hall	n/a	n/a
27/05/2003	United Energy	Deloitte	9.3%	4.04%
26/04/2006	AGL	Grant Samuel	11.6%	5.8%
19/06/2006	GasNet (regulated)	Lonergan Edwards	11.14%	5.29%
19/06/2006	GasNet (unregulated)	Lonergan Edwards	11.14%	5.29%
25/08/2006	Alinta Ltd	Grant Samuel	11.6%	5.8%
15/11/2006	Alinta Infrastructure Holdings	Grant Samuel	11.39%	5.79%
29/06/2007	Alinta Ltd (gas transmission)	Grant Samuel	11.74%	5.74%
29/06/2007	Alinta Ltd (gas and electricity distribution)	Grant Samuel	11.74%	5.74%
5/11/2007	SP AusNet (gas transmission)	Grant Samuel	11.78%	5.68%
5/11/2007	SP AusNet (gas and electricity distribution)	Grant Samuel	11.78%	5.68%
9/10/2009	Babcock & Brown Infrastructure Group (WA Gas Networks)	Grant Samuel	n/a	n/a
9/10/2009	Babcock & Brown Infrastructure Group (Tas Gas Pipeline)	Grant Samuel	n/a	n/a
9/10/2009	Babcock & Brown Infrastructure Group (WestNet Energy)	Grant Samuel	n/a	n/a

278 Incenta, *Further update on the required return on equity from independent expert reports*, February 2015, p25 (Attachment 10.11 to AGN's Initial AA Proposal).

279 Imputation adjusted estimates are taken from Table 3-20 of the TransGrid draft decision and thus reflect the adjustments for imputation made by the AER.

Report date	Business	Valuer	Return on equity (imputation adjusted)[279]	ERP (imputation adjusted)
9/10/2009	Babcock & Brown Infrastructure Group (TasGas)	Grant Samuel	n/a	n/a
22/09/2010	Spark Infrastructure Group	Lonergan Edwards	n/a	n/a
24/09/2010	Prime Infrastructure Group (TasGas)	Grant Samuel	10%	5%
13/04/2011	Spark Infrastructure Group	Lonergan Edwards	10.9%	5.4%
3/08/2012	Hastings Diversified Utilities Fund	Grant Samuel	8.52%	5.52%
3/10/2012	DUET Group	Grant Samuel	8.54%	5.54%
31/05/2013	DUET Group	Grant Samuel	n/a	n/a
4/03/2014	Envestra	Grant Samuel	8.67%	4.47%

Use of the Grant Samuel analysis

The AER has made significant errors in its interpretation of the Grant Samuel report for Envestra. When these errors are accounted for, it is clear that this evidence does not support the ERP and return on equity estimate adopted by the AER.

The AER presents a wide ERP range from the Grant Samuel report for Envestra – a range of 4.3% to 6.2% – and on this basis concludes that its ERP estimate of 4.55% is consistent with the range adopted by Grant Samuel.[280] However this range of ERP estimates referred to by the AER encompasses:[281]

- a lower bound that *does not* include any adjustment for imputation and does not allocate any of Grant Samuel's uplift to the ERP; and
- an upper bound that *does* include an adjustment for imputation and allocates all of Grant Samuel's uplift to the ERP.

The AER mixes apples and oranges, by mixing imputation-adjusted estimates with unadjusted estimates from the Grant Samuel report. Such an approach is illogical, particularly in circumstances where Grant Samuel has made clear that its estimates make no allowance for imputation credits.[282] Given that no allowance is made in the Grant Samuel estimates for imputation, an imputation adjustment must be made for comparison with the AER's ERP estimate. The unadjusted estimates from the Grant Samuel report are simply not comparable with the AER's ERP estimates. This is made clear in Grant Samuel's letter in response to the NSW draft decisions, where it states:[283]

> *"It is abundantly clear in our reports that we make no adjustment in our valuations for dividend imputation. Accordingly, a dividend imputation adjustment would be required to ensure comparability with the AER basis of calculation."*

Further, the Grant Samuel report and its letter in response to the NSW draft decisions make clear that the uplift is to account for factors likely to be affecting the return on equity (not the return on debt). The factors taken into account by Grant Samuel in making the uplift include: repricing of risk by equity investors since the GFC; alternative models, such as the Gordon Growth Model (a version of the DGM), currently indicating

280 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-525.
281 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-525, footnote 2004.
282 Grant Samuel, *Financial Services Guide and Independent Expert's Report to the Independent Board Sub-committee in relation to the Proposal by APA Group*, 3 March 2014, Appendix 3, pp8-9.
283 Grant Samuel, *Australian Energy Regulator – Draft Decision*, letter to the directors of TransGrid, 12 January 2015, p7 (Attachment 10.15 to AGN's Initial AA Proposal).

higher returns on equity than the SL CAPM; and evidence that brokers are currently adopting cost of equity estimates that are higher than indicated by the SL CAPM.[284]

A fundamental aspect of Grant Samuel's analysis was to conclude that the calculated SL CAPM return on equity was not an appropriate benchmark and understated the realistic required rate of return on equity, and this was one reason why Grant Samuel applied an uplift to its SL CAPM estimates. Therefore it is not appropriate to use Grant Samuel's "lower bound" SL CAPM estimate of the return on equity with no uplift.

Finally, it should be noted from the Grant Samuel report that it adopted a WACC estimate at the lower end of its range (6.5% to 7.0%) for the purposes of its valuation of Envestra assets, in order to ensure that the fairness assessment for the APA proposal was robust.[285] That is, Grant Samuel erred towards the lower end of its WACC range to ensure that its NPV valuation of the Envestra assets was conservative on the high side. This same tendency is not required to satisfy and, we argue, not consistent with the NGO or the ARORO, because these objectives seek to determine the return on equity that is sufficient to attract efficient investment in AGN's network.

On a correct interpretation of the Grant Samuel report for Envestra, it is clear that it does not support the AER's return on equity or ERP estimate. Incenta notes that the range for the return on equity implied by Grant Samuel's uplift factor was from 9.47% to 9.57%, with a respective ERP range of 5.27% to 5.37%, exclusive of any uplift for the value of imputation credits.[286] These Grant Samuel ranges compare with the AER's cost of equity of 7.3% and ERP of 4.55%.

Broker reports

The information from broker reports referred to in the Draft Decision does not support the AER's return on equity estimate.

It should be noted that the AER only refers to estimates from recent broker reports, being reports published over the past year. These reports therefore provide good information as to current market expectations of the required return on equity. These reports also provide some indication of how market practitioners have been estimating the return on equity in the current low risk-free rate environment.

Given that these reports are current, it is not appropriate to focus just on the ERP in these reports, as the AER appears to have done.[287] The evidence from these reports should also be used as a cross-check on the overall rate of return.

The relevant estimates for both the return on equity and ERP are the imputation-adjusted estimates. Estimates without an imputation adjustment cannot be compared to the AER's estimates of the ERP and return on equity.

The AER reports a range for the imputation-adjusted return on equity in recent broker reports of 7.3 to 9.3%.[288] The AER's estimate of the return on equity is at the very bottom of this range.

ERP estimates from 'other market participants', including practitioners and regulators

The AER also refers to ERP and return on equity estimates from other regulators, as part of the other information it takes into account in step 5 of its foundation model approach.

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284 Grant Samuel, *Financial Services Guide and Independent Expert's Report to the Independent Board Sub-committee in relation to the Proposal by APA Group*, 3 March 2014, Appendix 3, pp8-9.

285 Grant Samuel, *Australian Energy Regulator – Draft Decision*, letter to the directors of TransGrid, 12 January 2015, p4 (Attachment 10.15 to AGN's Initial AA Proposal).

286 Incenta, *Further update on the required return on equity from independent expert reports*, February 2015, p25 (Attachment 10.11 to AGN's Initial AA Proposal).

287 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-526.

288 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-526.

AGN considers that past decisions of the AER and other regulators should not be used as direct evidence of the required return on equity. These decisions are, at best, secondary evidence of the prevailing return on equity at previous points in time. However the return on equity in these decisions:

- will not reflect prevailing market conditions (rather, they will reflect market conditions at the time the decision was made); and
- may not be consistent with the ARORO, to the extent that they have been determined under different regulatory frameworks with different objectives.

Use of such decisions will also be circular and self-perpetuating where it is based on previous decisions the same regulator has made in relation to the return on equity.

For these reasons, AGN does not propose a role for other regulators' decisions in determining the return on equity for the BEE.

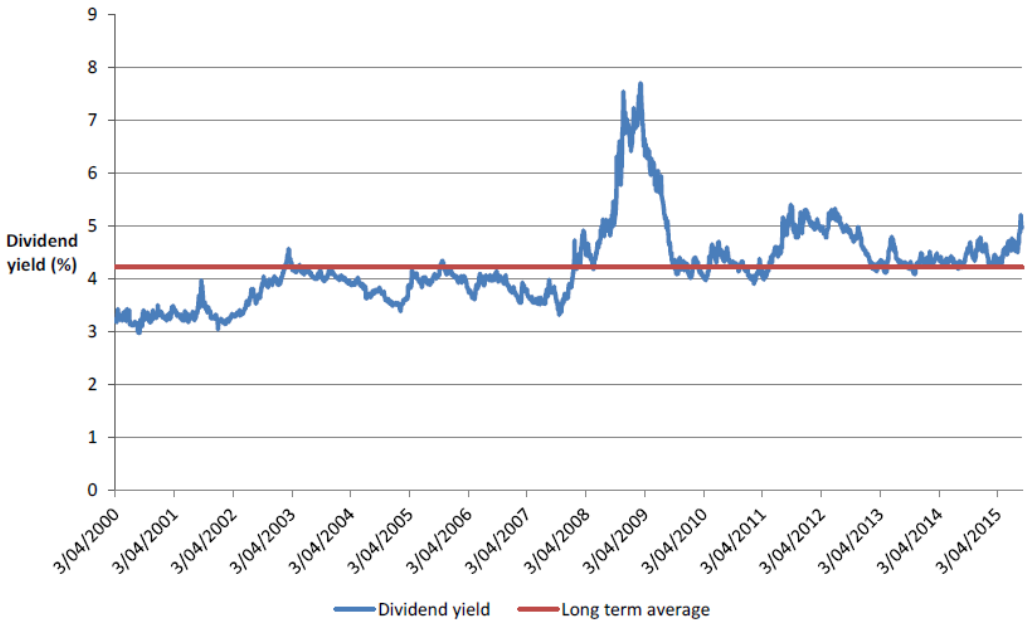
1.6.5.2 Conditioning variables

The Draft Decision refers to a number of conditioning variables, which are said to provide directional information, particularly in relation to the MRP. The evidence from these conditioning variables does not support the AER's approach to estimating the return on equity. In particular, this evidence is inconsistent with the AER's assumption that as the risk-free rate has fallen the MRP has remained constant (meaning that the return on equity has fallen in lock-step with the risk-free rate).

Dividend yields

As shown by the AER's Figure 3-21 (reproduced below), dividend yields have increased significantly in recent months and are now well above pre-GFC levels.[289]

Figure 3-21 Dividend yields



Source: Bloomberg, AER analysis.

[289] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-398.

As explained by CEG, given that the risk-free rate has been lower in the post-GFC period (and is now near historic lows), this implies that the MRP has risen by more than an offsetting amount.[290] Certainly, this evidence is not consistent with the AER's view that the return on equity has been falling in lock-step with the risk-free rate.

The AER has misinterpreted this evidence, by treating it as merely an indicator of whether the MRP is above or below historical average levels. The AER dismisses this evidence on the basis that:[291]

> *"It is unclear whether the recent increase in dividend yields is evidence of a sharp and sustained move away from their long term average. This short term movement does not provide a clear signal that the MRP should not be close to its historical average level."*

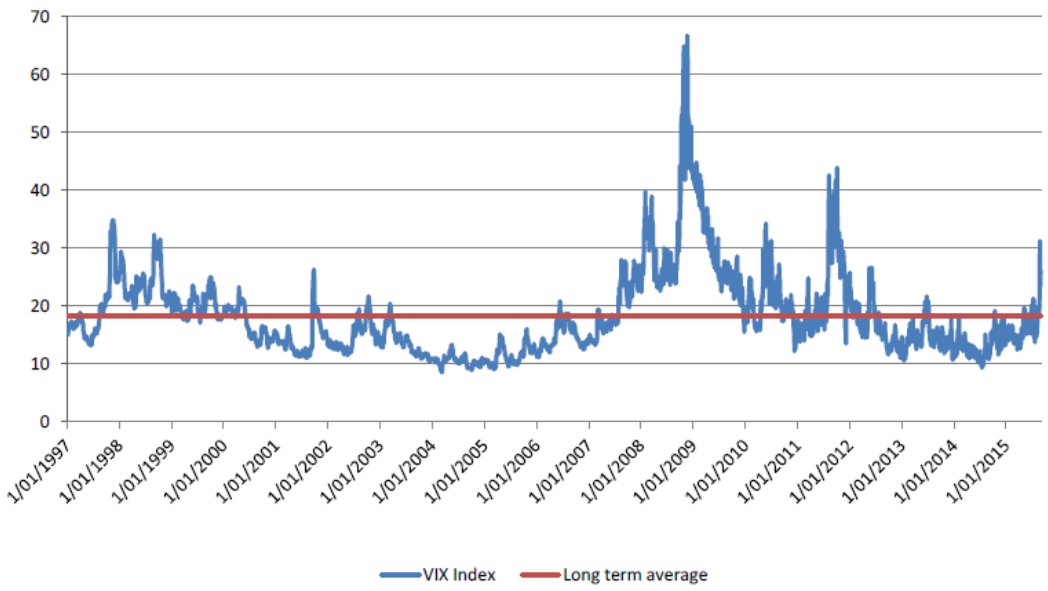
However movements in the dividend yield are not just an indicator of changes in the risk premium required by investors. Rather, changes in dividend yield indicate movements in the overall required return on equity. Therefore the fact that dividend yields have been increasing and are now well above pre-GFC levels indicates that as the risk-free rate has fallen post-GFC, the equity risk premium has increased.

This evidence certainly does not support the AER's assumption that the return on equity has been falling in lock-step with the risk-free rate.

Implied volatility

As shown by the AER's Figure 3-24 (reproduced below), the ASX200 implied volatility index has increased significantly in recent months and is now well above its 20-year average.[292]

Figure 3-24 Implied volatility (VIX) over time



Source: ASX200 VIX volatility index, sourced via Bloomberg cost AS51VIX from 2/1/2008 and CITJAVIX prior to 2/1/2008.

[290] CEG, *Estimating the cost of equity, equity beta and MRP*, January 2015, p 27 (http://www.aer.gov.au/system/files/Ausgrid%20-%207.03%20-%20CEG%20-%20Estimating%20the%20cost%20of%20equity%20-%20January%202015.pdf).

[291] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-398.

[292] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-402.

Whereas in previous decisions the AER has considered a relatively stable volatility index to be evidence of a steady MRP, in the Draft Decision the AER does not appear to take the recent increase in this measure into account as evidence of a higher MRP.

Rather, like the evidence of higher dividend yields, the AER seeks to dismiss this evidence on the basis that it "*does not provide a clear signal*". The AER states:[293]

> *"In the month of August, implied volatility has increased relative to its steady pattern of being below its long run average since 2012. This short term movement does not provide a clear signal that the MRP should not be close to its historical average level."*

AGN considers that the evidence for a higher MRP could not be any clearer. The AER's DGM analysis indicates that the MRP has increased as the risk-free rate has fallen, and that the MRP is now well above its historical average. The evidence from dividend yields and implied volatility measures further support this.

On the other hand, there does not appear to be any clear evidence to support the AER's view that the MRP has not changed as the risk-free rate has fallen or that the return on equity has fallen in lock-step with the risk-free rate—or even that current market conditions are consistent with average market conditions.

1.6.6 An alternative implementation of the foundation model approach

AGN's preferred approach to estimating the return on equity is as set out in its original Initial AA Proposal. This approach has regard to all relevant models and evidence, and uses this material for its proper purpose. Each of the relevant return on equity models is independently used to derive an estimate of the required return on equity, while other relevant evidence is used to determine the best estimate of each parameter within these models. The outputs from each relevant model are then weighted to arrive at a return on equity estimate. Based on updated data to reflect prevailing market conditions, this approach leads to an estimate of the prevailing return on equity of 9.76%.[294]

However if the AER proposes to continue relying solely on the SL CAPM to estimate the return on equity, the AER must change the way it implements this model. It is clear from the evidence referred to above that the way in which the SL CAPM is applied in the Draft Decision leads to a return on equity that is not consistent with the ARORO and does not reflect prevailing market conditions. The AER does not properly recognise the weaknesses of the SL CAPM, nor does it account for these weaknesses in its application of the model. Further, the AER's practice of applying an effectively fixed ERP to a variable risk-free rate is not appropriate in current market conditions, since it leads to the return on equity moving in lock-step with changes in the risk-free rate. The result is that the AER's estimate of the return on equity is below the level of return required by the market, as indicated by the AER's cross-checks and other relevant evidence.

The accompanying expert reports of Frontier Economics outline an alternative approach that involves properly adjusting SL CAPM parameters to deliver a return on equity that contributes to the achievement of the ARORO and reflects prevailing market conditions. This involves:[295]

- using a current measure of the risk-free rate (i.e. the prevailing yield on 10-year CGS). Over the 20 business days to 31 October 2015, this produces a risk-free rate of 2.68%;[296]

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293 AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-402.

294 Frontier, *The required return on equity under a foundation model approach*, January 2016, p7 (Attachment 10.34 to this Revised AA Proposal); Frontier, *An updated estimate of the required return on equity*, January 2016, section 1.2 (Attachment 10.31 to this Revised AA Proposal).

295 Frontier, *The required return on equity under a foundation model approach*, January 2016 (Attachment 10.34 to this Revised AA Proposal); Frontier, *An updated estimate of the required return on equity*, January 2016 (Attachment 10.31 to this Revised AA Proposal).

296 Frontier, *An updated estimate of the required return on equity*, January 2016, section 1.1 (Attachment 10.31 to this Revised AA Proposal).

- deriving the MRP in a way that gives appropriate weight to measures of the prevailing (current) MRP. Frontier recommends that 50% weight be given to estimates of the prevailing MRP from the DGM, 40% weight to historical measures and 10% weight to evidence from independent expert reports (i.e. evidence of market practitioner estimates of the MRP). Of the 40% weight that is assigned to historical measures, equal weight (i.e. 20% each) is given to estimates of historical excess returns and estimates using the Wright approach. This produces an MRP of 7.89%;[297]

- estimating a 'starting point' equity beta using a sufficiently large dataset. Frontier recommends including both US and Australian energy network businesses to ensure that the dataset is large enough to produce robust estimates, with twice as much weight given to the Australian data. This produces a 'starting point' equity beta of 0.82; and

- making two transparent and empirically based adjustments to the starting point equity beta estimate to account for the known shortcomings of the SL CAPM:

  – the first of these adjustments is to account for low beta bias, and draws on empirical evidence from the Black CAPM. Frontier recommends that 75% weight be given to this adjustment, in recognition of the strong and consistent evidence of low-beta bias in the empirical literature (i.e. the adjustment is 75% of the full adjustment that would need to be made to account for low-beta bias). This results in an adjustment from the starting point beta of 0.82 to a beta of 0.88; and

  – the second adjustment is to account for book-to-market bias (i.e. the failure of the SL CAPM to account for the effect of book-to-market ratio on stock returns). Frontier recommends giving less weight to this adjustment (25% weight) in recognition that the evidence in relation to this bias is more recent. This results in a further adjustment, to an equity beta of 0.91.

This leads to an estimate of prevailing return on equity of 9.84% in the placeholder averaging period (20 business days to 31 October 2015).[298]

Frontier observes that this estimate from the 'adjusted SL CAPM' is close to their estimate using the DGM, a model that is not affected by low-beta or book-to-market bias. Thus, the evidence from the DGM corroborates Frontier's adjusted SL CAPM estimate.

1.7 AGN Response to the Draft Decision – Interrelationships

The NGR require that, in determining the allowed rate of return, regard be had to any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.[299]

This section addresses relevant interrelationships involving the financial parameters discussed above.

1.7.1 Need for consistent application of the ARORO

AGN considers that the return on equity and return on debt need to be estimated on the basis of a consistent approach to the ARORO.

As discussed in section 1.4.2 above, AGN sees the ARORO as having two key elements:

- firstly, the ARORO requires identification of the level of risk that applies to the service provider in respect of the provision of reference services; and

297 Frontier, *An updated estimate of the required return on equity*, January 2016, section 1.3 (Attachment 10.31 to this Revised AA Proposal).
298 Frontier, *An updated estimate of the required return on equity*, January 2016, section 1.3 (Attachment 10.31 to this Revised AA Proposal).
299 NGR 87(5)(c).

- secondly, the ARORO requires estimation of efficient financing costs for a BEE facing a similar degree of risk.

AGN's proposed approaches to estimating the return on equity, the return on debt and the overall rate of return apply this framework consistently. Specifically:

- AGN considers that the relevant degree of risk, for the purposes of estimating both the return on equity and return on debt, is that faced by entities operating in a workably competitive market providing services similar to reference services within Australia.

- In estimating both the return on equity and return on debt, AGN's objective is to estimate the efficient financing costs of a BEE facing a similar degree of risk. This requires consideration of what financing practices would be engaged in by businesses facing the relevant degree of risk, operating in a workably competitive market. This is because it is ultimately competition that drives efficient behaviour. For example, AGN's proposed approach to estimating the return on debt reflects financing practices that would be engaged in by businesses facing the relevant degree of risk, operating in a workably competitive market. Similarly, AGN's estimates of the return on equity are benchmarked against returns required by the market for investing in businesses with a similar degree of risk, including those operating in competitive markets.

- Where AGN is required to estimate risk parameters, AGN does so on the basis of samples of businesses facing a similar degree of risk to that faced by entities operating in a workably competitive market providing services similar to reference services. The businesses included in these samples need not be providers of regulated services, but they must provide services that are sufficiently similar. For example in estimating the equity beta, AGN's proposed sample of businesses includes businesses operating in workably competitive markets providing services similar to reference services. Similarly, in estimating the return on debt, yields are measured using benchmark indices for the relevant credit rating band, with those indices reflecting bond yields across a wide range of businesses within that credit rating band, including businesses operating in competitive markets (i.e. a range of different businesses facing a similar degree of risk as assessed by credit rating agencies);

- AGN's assumed gearing ratio of 60% is broadly consistent with evidence of gearing ratios for businesses operating in a workably competitive market providing services similar to reference services. If anything, the evidence suggests that 60% may overstate gearing levels for such businesses, meaning that adopting this gearing assumption is likely to lead to a conservative (low) estimate of the overall rate of return.[300] Each of the samples of comparable firms used by Frontier in its latest equity beta analysis had mean gearing ratios of less than 60%.[301]

Thus, AGN's proposed approaches to estimating the return on equity, the return on debt and the overall rate of return, as set out in section 1.8 below, are consistent with the approach to the ARORO described in section 1.4.2 above.

1.7.2 Interrelationship between the return on equity and the value of imputation credits

There is a well-recognised interrelationship between the return on equity and the value of imputation credits (as discussed in Attachment 11.10). Since the MRP needs to be grossed up for the value of imputation

[300] For example, Telstra is assumed to have a gearing ratio of 40% for the purposes of price regulation (to the extent that it is price regulated), while Aurizon Network is assumed to have a gearing ratio of 55%.

[301] Frontier Economics analyses average gearing ratios across a sample of listed Australian infrastructure firms, including both regulated and unregulated businesses. Frontier notes that, while the mean gearing ratio across this sample is slightly below 60%, this is almost entirely due to the very low leverage levels of two entities – Aurizon (which began its life as a public company with very little debt and has stated its intention to increase leverage over time) and Qube (which is in the process of seeking to acquire Asciano and has maintained low leverage to preserve borrowing capacity). Refer to Frontier, *Estimating the equity beta for the benchmark efficient entity*, January 2016, p21 (Attachment 10.35 to this Revised AA Proposal)

credits, a higher theta estimate implies a higher required return on equity. This interrelationship is explicitly recognised in NGR 87(4)(b).

This interrelationship is accounted for in this Revised AA Proposal and the supporting expert advice. As explained by Frontier Economics,[302] the proposed MRP estimate of 7.89% is based on AER estimates of the MRP from historical excess returns and the DGM that assume a value for theta of 0.6. However Frontier notes that the impact on these estimates of adopting a lower theta value (e.g. a value of 0.35) is relatively small, particularly when compared to the effect of variation in the other factors that affect the estimate of the MRP. Frontier considers that the AER's estimates of the MRP from historical excess returns and the DGM are conservative in that the AER's historical returns estimate does not reflect the NERA correction for historical dividends and the AER's DGM estimates are based on *ad hoc* reductions to long-term GDP growth rates. Frontier notes that correcting for these effects would more than offset any adjustment needed to account for a reduction in the estimate of theta from 0.6 to 0.35.

If the AER were to reduce its estimate of theta to 0.35, while maintaining its current approach to estimating the MRP, no adjustment to the AER's MRP estimate would be necessary. This is because the top of the AER's range of estimates of the historical average MRP (used by the AER as its MRP point estimate) would remain at 6.5%.[303]

1.7.3 Interrelationships with the inflation forecast

As noted in Attachment 9.3, there is an interrelationship between the method for forecasting inflation and the amount that is deducted from the annual revenue requirement for indexation of the capital base, and between the allowed rate of return and the method for forecasting inflation.

The first of these interrelationships is a direct interrelationship. If the forecast of inflation is too high – that is, if actual inflation turns out to be materially lower than had been forecast – the deduction from the annual revenue requirement will be too large. This will lead to under-recovery of costs over the long-term, since the amounts deducted from the annual revenue requirement will be larger than the amount by which the capital base is increased by actual inflation at the end of the AA period.

The second of these interrelationships is more indirect. As noted above, the deduction from the annual revenue requirement for indexation is needed to avoid "double counting" of inflation. In effect, inflation is counted twice (i.e. because, under the AER's current practice, a nominal rate of return[304] is calculated in combination with an indexed capital base) and deducted once. It is therefore important that each time it is counted or deducted, a consistent approach to forecasting inflation is used.

The forecast of inflation used to calculate the revenue deduction therefore needs to be:

- accurate (i.e. as close as possible to actual inflation, which is used to roll forward the capital base at the end of the AA period); and
- consistent with the implied forecast of inflation in the nominal rate of return.

It is for this reason (as further discussed in Attachment 9.3) that AGN proposes to adopt a market-based estimate of forecast inflation. Using a market-based method ensures consistency with how the allowed rate of return is estimated, and in current market conditions, will provide for a more accurate forecast.

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302 Frontier, *The required return on equity under a foundation model approach*, January 2016, pp34-37 (Attachment 10.34 to this Revised AA Proposal).

303 For reasons set out in section 1.6.4.2, AGN does not agree with the AER's approach to estimating the MRP. However AGN notes that if the AER were to maintain the same approach to estimating the MRP while lowering its estimate of theta, its estimate of the MRP would not need to change. NERA provides estimates of the historical average MRP based on theta assumptions of 0.35 and 0.6. Over the longest available time period, NERA estimates a historical average MRP of 6.65% using a theta assumption of 0.6, and 6.56% using a theta assumption of 0.35 (NERA, *Historical Estimates of the Market Risk Premium*, February 2015, pp 42-43, Attachment 10.9 to AGN's Initial AA Proposal). Thus, NERA's analysis shows that if the AER were to reduce its theta estimate from 0.6 to 0.35, the top of the range for the historical average MRP (with the AER uses as its MRP point estimate) would remain at approximately 6.5%.

304 NGR 87(4)(b).

1.7.4 Claimed interrelationship between the approach to the return on debt and equity beta

In the Draft Decision, the AER suggests that there may be an interrelationship between the choice of method for estimating the return on debt (in particular, whether a trailing average method is adopted) and the equity beta. It is suggested that, to the extent there is a degree of "*mismatch risk*" due to the choice of method for estimating the return on debt (i.e. a risk that the allowed return on debt does not reflect the debt financing costs of a BEE), this ought to be accounted for in estimating the equity beta.[305]

AGN does not accept that there is this interrelationship between the transition method for estimating the return on debt and the equity beta. The risk of a mismatch between the regulatory allowance for the return on debt and efficient financing costs is not a non-diversifiable systematic risk.

Chairmont, in its report to the AER, makes this point clear:[306]

> *"Interest rate risk per se is a systematic risk for all or most companies in the market. However, the form of interest rate risk applicable to NSPs in the 'on-the-day' regime was something quite specific to firms under that regulatory umbrella. Most industries would have had greater total interest rate risk than regulated NSPs, as most enterprises do not have the benefit of a direct link between the interest rate impact of their revenues and their costs which NSPs do. This places NSPs in a better position than an unregulated business, as the allowance is in effect a revenue item that they can manage to, even with the uncertainties of the DRP mismatch component.*
>
> *Ex-post results for the DRP mismatch would have impacted the profit results of the NSPs, which may then have caused some benefit or drag to the share price of the specific NSP. However, it may be argued that this is not a systematic risk. The variability of cashflow is specific to the industry and the individual NSP and may be diversifiable by investors. If this is so, then the required return on equity would not be affected by the DRP mismatch risk as it was a diversifiable specific risk rather than a component of market systematic risk. Therefore, the return on equity should be the same regardless of the existence of DRP mismatch risk and beta should not change because of it."*

It follows that any change in the AER's approach to estimation of the return on debt (including any change to the transition method) will not affect the return on equity.

1.8 Summary

For reasons set out above, AGN does not agree with the AER's approach to estimating the allowed rate of return. AGN's position on the correct approach to estimating each parameter is set out below.

1.8.1 Return on debt

For reasons set out in section 1.5, it is AGN's primary position that the trailing average approach to estimating the return on debt should be implemented immediately, with no transition. This is necessary to ensure that the return on debt allowance reflects the efficient financing costs of a BEE – i.e. the cost of financing a staggered portfolio of fixed-rate debt.

Alternatively, even if the AER's view is correct that it is necessary to have regard to the financing practices of a regulated BEE in response to previous regulatory methodologies and settings, the appropriate approach would be to adopt either:

1. a hybrid form of transition with the assumed level of hedging based on evidence as to the optimal hedging ratio; or

[305] AER 2015, "Attachment 3 – Rate of Return | Draft Decision: Australian Gas Networks 2016 to 2021", November 2015, pg. 3-177 to 179.
[306] Chairmont, *Financing Practices Under Regulation: Past and Transitional*, 13 October 2015, p 40.

2. a hybrid form of transition with an assumption of 100% hedging of the base rate, if evidence supported this assumption.

Of these latter two alternative positions, AGN submits that the first is preferable. If the AER is correct that efficient financing practice involves some degree of hedging of the base rate, it is then necessary to consider to what degree hedging would be efficient, and a transition can only apply to the base rate component to the extent that the BEE used hedging to match the previous on-the-day approach to setting the allowed return on debt. The evidence demonstrates that the efficient level of hedging under the previous on-the-day approach was around one third.

AGN refers to and repeats its position regarding the three approaches referred to above, as set out at the end of section 1.2 above.

Estimates for the first year of the AA period based on each of the three alternative approaches are set out in Table 9 below. These estimates are based on a 10 year benchmark term of debt and credit rating of BBB+. The data is sourced from the RBA and Bloomberg curves, extrapolated to a 10 year term. For the eight years to 2013/14, the DRP is calculated as the average of the RBA and Bloomberg data, extrapolated using the AER method. In 2014/15, the data and extrapolation method for calculating the DRP is chosen in accordance with the testing for best fit as formulated by CEG.[307] For 2015/16, the 2014/15 DRP is adopted as a placeholder. The base rate is calculated by reference to Bloomberg swap values in placeholder averaging periods of 1 July to 30 October 2015 (no transition) and 1 to 30 October 2015 (hybrid transitions).

TABLE 9: INDICATIVE RETURN ON DEBT FOR 2016/17[308]

Transition method	Return on debt for first year (including new issue premium)
No transition (immediate application of trailing average method)	7.93%
Hybrid transition, assuming an optimal hedging ratio of 33.3%	7.08%
Hybrid transition, assuming 100% hedging	5.39%

AGN proposes that the return on debt be updated in subsequent years of the AA period in accordance with the method and formulae set out in section 1.5.6.[309]

AGN's proposal represents a departure from the methods for estimating the return on debt set out in the Rate of Return Guideline. AGN's reasons for departure are set out in section 1.5 above.

TABLE 10: SUMMARY OF AGN'S RESPONSE TO THE AER DRAFT DECISION ON THE RETURN ON DEBT

	AER Draft Decision	AGN Response	AGN Comment
Credit rating and debt term	Accept AGN proposal	Accept Draft Decision	AGN accepts the use of a credit rating of BBB+ and debt term of 10 years
Transition to trailing average	Accept AGN proposal	Modify Draft Decision	AGN accepts that there should be a move from an on-the-day approach to a trailing average approach, but proposes that the transition be implemented immediately at the commencement of the AA period (i.e. the "no transition" approach)

[307] CEG, *The hybrid method for the transition to the trailing average rate of return on debt – Assessment and calculations for* AGN, June 2015, Section 5 and Appendix A (Attachment 10.22 to AGN's Initial AA Proposal); CEG, *Curve testing and selecting averaging periods*, January 2016, pp3-7 (Attachment 10.27 to this Revised AA Proposal).

[308] CEG, *Curve testing and selecting averaging periods*, January 2016, Table 6 (Attachment 10.27 to this Revised AA Proposal).

[309] In the PTRM accompanying the Revised AA Proposal, AGN has applied the proposed methodology the updating the return on debt under the "no transition" approach, using the placehodlder estimated return for 2015/16 as a proxy for each subsequent regulatory year of the AA period.

Form of transition	Reject AGN proposal	Respond to Draft Decision	AGN rejects a 10-year transition applied to both the base rate and the DRP. Rather, AGN proposes that: • there should be no transition; • alternatively, any transition should be of the base rate only over 10 years, based on that proportion of the base rate which it is efficient to hedge (i.e. 33.3%) (optimal hedging hybrid transition); and • alternatively, any transition should be of 100% of the base rate only over 10 years (full hybrid transition) AGN confirms that, if the AER rejects each of the above alternatives, AGN raises and maintains the second proposal (the optimal hedging hybrid transition)
Measurement of base interest rate	Modify AGN proposal	Modify Draft Decision	AGN maintains its original proposal for the base interest rate to be measured as the average of relevant swap rates over the relevant averaging period
DRP data sources	Reject AGN proposal	Respond to Draft Decision	AGN maintains its original proposal for best fit testing for data sources
DRP extrapolation methods	Reject AGN proposal	Respond to Draft Decision	AGN maintains its original proposal for best fit testing for extrapolation methods
Averaging periods	Modify AGN proposal	Respond to Draft Decision	AGN maintains its original proposal for separate averaging periods for the base rate and DRP If the averaging periods are not separated, AGN nominates the (shorter) base rate averaging periods for both the base rate and DRP
New issue premium	Reject AGN proposal	Respond to Draft Decision	AGN maintains its original proposal to include a new issue premium of 27 basis points in the return on debt calculation
Swap strategy transaction costs	Reject AGN proposal	Respond to Draft Decision	AGN does not include any swap transaction costs in its proposed no transition approach to calculating the cost of debt Alternatively, if a hybrid transition is applied, AGN now proposes to include swap transaction costs of 11.5 basis points in the return on debt calculation
Debt raising costs	Modify AGN proposal	Accept Draft Decision	AGN accepts the Draft Decision in respect of debt raising costs (subject to any consequential amendments required as a result of changes in the capex allowance in the Final Decision)
Overall proposal	Reject AGN proposal	Respond to Draft Decision	AGN proposes a return on debt of: • 7.93% (indicative for 2016/17), based on no transition; • alternatively, 7.08% (indicative for 2016/17), based on an optimal hedging hybrid transition; • alternatively, 5.39% (indicative for 2016/17), based on a full hybrid transition AGN confirms that, if the AER rejects each of the above alternatives, AGN raises and maintains the second proposal (i.e. the optimal hedging hybrid transition)

1.8.2 Return on equity

AGN's preferred approach to estimating the return on equity is as set out in its Initial AA Proposal. This approach has regard to all relevant models and evidence, and uses this material for its proper purpose. Each of the relevant return on equity models is independently used to derive an estimate of the required return on equity, while other relevant evidence is used to determine the best estimate of each parameter within these models. The outputs from each relevant model are then combined to arrive at a return on equity estimate. Based on updated data to reflect prevailing market conditions, this approach leads to an estimate of prevailing return on equity of 9.76%.

However if the AER proposes to continue relying solely on the SL CAPM to estimate the return on equity, the AER must change the way it implements this model. The way in which the SL CAPM is applied in the Draft Decision leads to a return on equity that is not consistent with the ARORO and does not reflect prevailing market conditions. The AER does not properly recognise the weaknesses of the SL CAPM, nor does it account for these weaknesses in its application of the model. Further, the AER's practice of applying an effectively fixed risk premium to a variable risk-free rate is not appropriate in current market conditions, since it leads to the return on equity moving inappropriately in lock-step with changes in the risk-free rate.

The accompanying expert report of Frontier Economics outlines an alternative approach that involves properly adjusting SL CAPM parameters to deliver a return on equity that contributes to the achievement of the ARORO and reflects prevailing market conditions. This involves:

- making a transparent and empirically based adjustment to the equity beta estimate to account for the known shortcomings of the SL CAPM, particularly low beta bias; and
- deriving the MRP in a way that gives appropriate weight to measures of the prevailing (current MRP).

This leads to an estimate of prevailing return on equity of 9.84% in the placeholder averaging period (20 business days to 31 October 2015). This is calculated using the SL CAPM with an equity beta of 0.91, MRP of 7.89% and a risk-free rate of 2.68%.

For reasons set out in section 1.6, AGN considers that either the multi-model approach or the 'adjusted SL CAPM' approach (as described above and in section 1.6.6) would be clearly preferable to the approach taken in the Draft Decision. For the purposes of this submission, AGN adopts the multi-model approach. If the AER rejects either approach, AGN raises and maintains the 'adjusted SL-CAPM' approach.

Either of the alternative approaches put forward by AGN would represent a departure from the methods for estimating the return on equity set out in the Rate of Return Guideline. AGN's reasons for departure are set out in section 1.6 above.

TABLE 11: SUMMARY OF AGN'S RESPONSE TO THE AER DRAFT DECISION ON EQUITY

	AER Draft Decision	AGN Response	AGN Comment
Multi-model approach to return on equity	Reject AGN proposal	Respond to Draft Decision	AGN maintains its original proposal of a multi-model approach to estimate the return on equity
Measurement of risk free rate	Modify AGN proposal	Modify Draft Decision	AGN accepts that 10 year CGS yields be used to estimate the risk free rate, but adopts an updated placeholder averaging period
Estimate of equity beta	Reject AGN proposal	Respond to Draft Decision	AGN proposes an estimate of equity beta (for use in the SL CAPM as a foundation model) of 0.91
Estimate of MRP	Reject AGN proposal	Respond to Draft Decision	AGN proposes an estimate of the MRP of 7.89%

Overall proposal	Reject AGN proposal	Respond to Draft Decision	AGN proposes a return on equity of 9.76% (indicative) (using the multi-model approach) Alternatively, if the return on equity is to be estimated using the SL CAPM as a foundation model, the return on equity should be 9.84% (indicative) If the AER rejects either approach, AGN raises and maintains the second proposal (i.e. the adjusted SL CAPM approach)

1.8.3 Overall rate of return

AGN maintains its proposed gearing ratio of 60%. Applying this gearing ratio and the estimates of the return on debt and return on equity set out above leads to a nominal vanilla rate of return of 8.66% (indicative for 2016/17) in the placeholder averaging period (October 2015).

TABLE 12: SUMMARY OF AGN'S RESPONSE TO THE AER DRAFT DECISION ON OVERALL RATE OF RETURN

	AER Draft Decision	AGN Response	AGN Comment
Gearing ratio	Accept AGN proposal	Accept Draft Decision	AGN accepts a gearing ratio of 60%
Overall proposal	Reject AGN proposal	Respond to Draft Decision	AGN proposes an overall rate of return of 8.66% (indicative for 2016/17) (using a no transition approach to the return on debt and using the multi-model approach to estimate the return on equity) If the AER rejects AGN's approaches, AGN proposes the approaches to the return on debt and equity as raised and maintained as set out herein