Draft Rate of Return Guidelines

Meeting the requirements of the National Gas Rules

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Economic Regulation Authority
WESTERN AUSTRALIA

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Contents

1 Introduction

1. The Authority's responsibilities under the National Gas Law (**NGL**) and the National Gas Rules (**NGR**) relate to approving third party access regimes in Western Australia for the Dampier to Bunbury Natural Gas Pipeline, the Goldfields Gas Pipeline and the Mid-West and South-West Gas Distribution System.

2. Under the recent changes to the NGR, the Authority is required to produce rate of return guidelines at least every three years.[1] The guidelines provide an opportunity to undertake a comprehensive review of approaches for determining the rate of return on capital.

3. This Draft Rate of Return Guidelines sets out the Authority's position.

4. The companion Explanatory Statement for the Draft Rate of Return Guideline sets out the Authority's reasoning in more detail, as well as the process for stakeholders to comment on these Draft Guidelines and the Explanatory Statement. **Submissions are sought by 4:00pm (WST) on Thursday 19 September 2013.**

The requirement

5. The NGR require that the rate of return guidelines set out the:[2]

   - methodologies that the Authority proposes to use in estimating the allowed rate of return, including how those methodologies result in a determination that is consistent with the allowed rate of return objective; and
   - estimation methods, financial models, market data and other evidence that the Authority proposes to take into account in estimating the return on equity, the return on debt and the value of imputation credits.

6. The Authority considers that 'methodologies' refer to the systems of methods used in the development the rate of return guidelines, and encompass the subsidiary estimation methods, financial models, market data and other evidence.[3] 'Estimation methods' provide for the procedures used for estimating the rate of return. 'Financial models' refer to those mathematical and statistical representations that are used to inform the rate of return, such as, for example, the Sharpe-Lintner Capital Asset Pricing Model. 'Market data' refers to any input data that is utilised for the rate of return, and may include, for example, financial data, or sample data from comparable firms to the benchmark. 'Other evidence' may be broad ranging and is considered without limitation, except that it needs to be 'relevant' to the estimation of the rate of return.

7. The rate of return guidelines will provide guidance for subsequent gas access decisions of the Authority for the three Western Australian gas pipelines and networks, although they will not be mandatory.[4] The Authority or service providers may depart from the guidelines in reviewing an access arrangement, provided that adequate explanation is provided at the time of the review.

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1 NGR 87(13)

2 NGR (14)

3 The Oxford Dictionary definition refers to a 'system of methods' (see oxforddictionaries.com).

4 NGR (18)

2 The broad regulatory framework

8. This section sets out the Authority's views on the regulatory framework that informs the development of the rate of return guidelines. It first sets out the origins of, and the current broad approach to, regulation of energy utilities in Australia. It then summarises the requirements of the NGL and the NGR, and draws on these to articulate a framework for the rate of return regulatory decision making process.

9. The section then sets out the criteria that the Authority will use to inform its regulatory judgment in future access arrangement decisions.

Incentive regulation

10. Incentive regulation has a reasonably short history in Australia. Up until 1990 public ownership of monopoly infrastructure was one recognised way to control monopoly behaviour, as it provided a 'window' for the government, as the major shareholder, to control output, as well as influence levels of investment and operating costs.

11. However, it also was recognised that this approach to dealing with monopolies often entailed significant economic loss, as it did not provide the expected discipline on inefficient investment and operating expenditures. Utilities often continued to 'game' the government owner, extracting monopoly rents through unproductive activities such as 'x inefficiency' and 'gold plating'. [5,6]

12. By the 1980s, these problems were being recognised, and in response, new regulatory approaches were being developed.[7]

> Beginning in the 1980s, theoretical research on incentive regulation rapidly evolved to confront directly imperfect and asymmetric information problems and related contracting constraints, regulatory credibility issues, dynamic considerations, regulatory capture, and other issues that regulators have been trying to respond to for decades but in the absence of a comprehensive theoretical framework to guide them.

13. This led to a rapid change in approach from the late 1980s to adopt 'incentive regulation:[8]

> What do we mean by incentive regulation? In particular, it means that the regulator delegates certain pricing decisions to the firm and that the firm can reap profit increases from cost reductions. Incentive regulation makes use of the firm's information advantage and profit motive. The regulator thus controls less behaviour but rather rewards outcomes.

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5 'X inefficiency' occurs when firms do not minimise inputs to production, implying that they are then not on the 'production possibility frontier', or as productively efficient as they might be. Gold plating occurs when firms over-invest in assets, again leading to reduced levels of productive efficiency. Gold plating may result in increased levels of regulated return per customer.

6 This situation contrasted with that in the United States, where private ownership and statutory monopoly regulation through independent 'cost of service' (or rate of return) regulation had existed for much of the 20th Century. However, it was recognised during the 1960s that this approach could also lead to inefficiencies, particularly through a tendency to increase capital investment (the 'Averch Johnson' effect). Some economists suggested that the outcomes were no better than unregulated monopoly.

7 Joskow P. 2006, *Incentive Regulation in Theory and Practice: Electricity Distribution and Transmission Networks*, Cambridge Working Papers in Economics 0607, http://ideas.repec.org/s/cam/camdae.html.

8 Vogelsang I. 2002, Incentive Regulation and Competition in Public Utility Markets: A 20-Year Perspective, *Journal of Regulatory Economics*; 22:1, p. 6.

> Worldwide, the introduction of incentive regulation has been part of the regulatory reform movement, consisting of privatization, liberalization and deregulation...
>
> ...The most important types of incentive regulation have been price caps, rate case moratoria, profit sharing, banded rate of return regulation, yardstick regulation, and menus. Overall, price caps have become the most widespread...
>
> ...Price caps are defined by an index of the regulated services that is adjusted annually by (1) an inflation factor that takes care of the economy-wide price level or of the level of input prices, (2) an X-factor that reflects efficiency improvements of the firm, and (3) a Y-factor that allows for pass-through of specific cost items outside the firm's control. The index is further adjusted in regulatory proceedings over the longer-term

Incentive regulation in Australia

14. The policy response in Australia was to initiate and adopt the recommendations of the 1993 Hilmer review, which set out a comprehensive program of microeconomic reform for the monopoly utility sector.[9] Hilmer's proposed reforms for competition policy included the restructuring of public sector monopoly businesses, and the arrangements to facilitate third party access to nationally significant infrastructure. The intent was to introduce the discipline of competitive markets wherever possible, and to regulate for efficiency in the remaining monopoly elements.

15. These proposals were subsequently broadly implemented by the Council of Australian Governments, through the Competition Principles Agreement of 1995 and associated reforms. In addition, under clause 2 of the Competition Principles Agreement, states and territories undertook to establish independent sources of prices oversight for their monopolistic business enterprises.

Incentive regulation for gas infrastructure

16. These arrangements, once established, continued to evolve. In the case of gas, the updated 2009 NGL provides for a legislated uniform national framework governing access to monopoly gas infrastructure, and arrangements for prices oversight. The national gas objective (**NGO**) sets out the aim of the NGL:[10]

> The objective of this Law is to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.

17. The Authority notes that it is clear that NGL and the NGO is intended to promote economic efficiency:[11]

> The national gas objective is an economic concept and should be interpreted as such.
>
> The long term interest of consumers of gas requires the economic welfare of consumers, over the long term, to be maximised. If gas markets and access to pipeline services are efficient in an economic sense, the long term economic interests of consumers in respect of price, quality, reliability, safety and security of natural gas services will be maximised. By the promotion of an economic efficiency objective in access to pipeline services, competition will be promoted in upstream and downstream markets.

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[9] For a summary, see http://ncp.ncc.gov.au/pages/reform.

[10] Western Australian Government Gazette 2009, *National Gas Access (WA) Act 2009*, www.slp.wa.gov.au, p. 76.

[11] National Gas (South Australia) Bill 2008, *Second Reading Speech*, www.ret.gov.au, p. 4.

18. A number of revenue and pricing principles (**RPP**) in the NGL give effect to the objective.[12] The RPP establish that the NGO is to be promoted by targeting economically efficient outcomes, through effective *incentives* for efficient investment in infrastructure and efficient provision of services and the use of the infrastructure, specifically:

> A service provider should be provided with effective incentives in order to promote economic efficiency with respect to reference services the service provider provides.
>
> The economic efficiency that should be promoted includes—
>
> (a) efficient investment in, or in connection with, a pipeline with which the service provider provides reference services; and
>
> (b) the efficient provision of pipeline services; and
>
> (c) the efficient use of the pipeline.

19. This specification of 'effective incentives in order to promote economic efficiency' in the RPP is entirely consistent with the incentive regulation approach. Incentive regulation provides an opportunity for the regulated utility to perform better than the regulator's ex ante forecasts of its costs. Subsequent savings are then shared between the utility and consumers. This is recognised as creating incentives for outcomes that are more efficient, and hence in the long term interests of consumers.

20. With regard to rate of return, the Australian Energy Market Commission has established the new allowed rate of return objective in the NGR:[13]

> The allowed rate of return objective is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services

21. In this context, the AEMC stated in its final rule determination that the new allowed rate of return objective is intended to be consistent with the National Electricity Objective (**NEO**), the NGO and the RPP:[14]

> The Commission has taken the opportunity in this final rule determination to explain how the new rules are to be interpreted. Most importantly, the new rules allow the regulator (and the appeal body) to focus on whether the overall rate of return meets the allowed rate of return objective, which is intended to be consistent with the NEO, the NGO and the RPP.

Other elements in the new National Gas Rule 87

22. The NGR 87 includes a number of sub-rules which refer to matters the regulator is to have 'regard' to, when determining the allowed rate of return, including:

> NGR 87(5) In determining the *allowed rate of return*, regard must be had to:
>
> (a) relevant estimation methods, financial models, market data and other evidence;
>
> (b) 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

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12 Ibid.

13 Australian Energy Market Commission 2012, *National Gas Rules*, www.aemc.gov.au, clause 87(3).

14 Australian Energy Market Commission 2012, *Rule Determination: National Electricity Amendment (...) Rule 2012*, www.aemc.gov.au, 29 November, p.23.

(c) any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.

NGR 87(7) In estimating the return on equity under subrule (6), regard must be had to the prevailing conditions in the market for equity funds.

NGR 87(11) In estimating the return on debt under subrule (8), regard must be had to the following factors:

(a) the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity referred to in the *allowed rate of return objective* ;

(b) the interrelationship between the return on equity and the return on debt;

(c) the incentives that the return on debt may provide in relation to capital expenditure over the *access arrangement period*, including as to the timing of any capital expenditure; and

(d) any impacts (including in relation to the costs of servicing debt across *access arrangement periods*) on a benchmark efficient entity referred to in the *allowed rate of return objective* that could arise as a result of changing the methodology that is used to estimate the return on debt from one *access arrangement period* to the next.

23. In addition, the new NGR 87 sets out a number of additional requirements for the *allowed rate of return*, including that:

- it is to be determined such that it achieves the allowed rate of return objective (new NGR 87(2));
- subject to the rate of return objective (new NGR 87(2)), the allowed rate of return for a regulatory year is to be:
  - a weighted average of the return on equity for the access arrangement period in which the regulatory year occurs and the return on debt for that regulatory year (new NGR 87(4)(a));
  - determined on a nominal vanilla rate of return that is consistent with the estimate of the value of imputation credits (new NGR 87(4)(b));[15]
- results in a return on debt for a regulatory year which contributes to the achievement of the allowed rate of return objective (new NGR 87(8)) which is either the same in each year of the access arrangement period or which varies in each year through the application of an automatic formula (new NGR 87(9) and NGR 87(12));
- incorporates a return on debt that would be required by debt investors over a relevant time period (whether shortly before the access arrangement decision, or on average over an historical period, or some combination of the two approaches) (new NGR 87(10)).

[15] The specification of a vanilla WACC implies that tax liabilities must be estimated separately to the rate of return. On this basis, the requirement is for a 'post-tax' approach.

Implications for the regulator

24. The anchor for any regulatory decision will be the overall regulatory framework that is considered to best deliver the requirements of the NGL, NGR, NGO, RPP and the allowed rate of return objective. The Authority considers that this framework may be informed by an objective function, and a number of constraints:

    a. The primary objective is to achieve a rate of return for a service provider 'commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk in respect of the provision of reference services'.[16] Related objectives include a need to achieve the allowed rate of return:

        i. for each of the regulatory years;[17]

        ii. incorporating effective incentives to promote efficient investment;[18]

        iii. that is in the long term interests of consumers.[19]

    b. A constraint is that uncertainty about the future, information asymmetries, and circularity problems complicate the task of determining the rate of return. On this basis, it is recognised that the regulator needs only to estimate a cost of debt and cost of equity which gives the efficient service provider 'reasonable opportunity' to recover its costs over the regulatory period.[20]

    c. A further constraint is a requirement to minimise transaction costs for the service provider and regulator.

25. The current regulatory approach assumes that the efficient firm that meets the above objectives provides the 'benchmark'. The 'benchmark efficient firm' informs the cost building blocks for each regulatory decision.

26. An implication of point a) is that the rate of return must remunerate the efficient financing costs of the service provider over the lives of the assets, in terms of net present value.[21]

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16 National Gas Rule 87(3) – the allowed rate of return objective.

17 National Gas Rule 87(4).

18 National Gas Law 24(3) – a Revenue and Pricing Principle – states that the 'a service provider should be provided with effective incentives to promote economic efficiency with respect to reference services'. Note that the AEMC has stated that 'The Commission has taken the opportunity in this final rule determination to explain how the new rules are to be interpreted. Most importantly, the new rules allow the regulator (and the appeal body) to focus on whether the overall rate of return meets the allowed rate of return objective, which is intended to be consistent with the NEO, the NGO and the RPP' (Australian Energy Market Commission 2012, *Rule Determination: National Electricity Amendment (...)Rule 2012*, www.aemc.gov.au, 29 November, p.23.

19 As per the National Gas Objective.

20 National Gas Law 24(2) – a Revenue and Pricing Principle – states that the 'service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs'.

21 This is consistent with the 'NPV=0' condition. For more detail, refer to Appendix 3 of the Rate of Return Guidelines Explanatory Statement.

27. The implication of the efficiency element of point a) is that the benchmark firm is assumed to be on or near the efficiency frontier, consistent with the performance and cost structure of an efficient service provider. The efficient firm would be part of the portfolio of efficient assets held by an investor:

- The benchmark firm's efficient cost of finance will reflect the prevailing conditions in capital markets for the cost of debt and equity, taking into account its risk. The resulting discipline on its cost structure is entirely consistent with that faced by firms in competitive markets, where prices, and returns, are set with reference to the prevailing cost of capital.
- An implication of adopting the benchmark efficient firm is that the actual decisions of the service provider may differ (and often will differ) from the benchmark firm. However, under incentive regulation the regulator does not compensate the regulated service provider for its actual decisions, but compensates it *as if* it were operating efficiently. If the service provider is not actually operating efficiently relative to the benchmark then that is a matter for management and the shareholders of the service provider.
- In addition, the benchmark cannot be purely hypothetical. The benchmark should be based on the actual costs and risks faced by an efficient service provider.
- The benchmark approach provides high powered incentives for the regulated business. If the regulated business is able to exceed the benchmark performance, it is able to retain any increased profits during the regulatory period. If the regulated firm fails to achieve the benchmark, then its bears the relevant losses.

28. The efficient firm would provide reference services in a way which meets consumers' preferences with regard to price, quality, reliability, safety and security, thereby meeting the requirement of a)(iii).

29. An implication of the subsidiary objective of point a)(i) relating to regulatory years is that the allowed rate of return objective looks forward to the actual regulatory years of the access arrangement period.

30. An implication of the subsidiary objective of point a)(ii) relating to effective incentives is that best practice regulation will generally set an estimated return ex ante, and then allow the firm to capture a portion of any subsequent out-performance. A portion of the out-performance resulting from this incentive regime ultimately may be shared with consumers.

31. An implication of point a)(i) and point b) is that the regulator sets the rate of return based on the most 'reasonable' predictors of the cost of debt and the cost of equity for the future regulatory years.[22] One advantage of establishing incentive regimes under point a)(ii), noted above, is that these may be structured to help the regulator to observe the true finance costs of the firm, thereby assisting the regulator to overcome information asymmetries.

32. An implication of point c) is that regulators are reluctant to revisit the returns to the firm too frequently, particularly where this increases transactions costs for both the regulator and the firm, or where it reduces the power of any incentives associated

[22] National Gas Law 24(2) – a Revenue and Pricing Principle – states that 'a service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs...'.

with an ex ante approach. Current practice is to set the regulated return for a five year period.

Criteria for application of regulatory discretion

33. The Authority considers that it will need to exercise judgment in meeting the requirements of the NGL and the NGR, and that criteria would help to provide a framework for that exercise, while enhancing transparency and predictability for stakeholders.

34. The following criteria are not intended to supplant the NGL and NGR. Rather they are subordinate to the requirements set out in the two instruments.

35. The Authority considers it desirable for the proposed rate of return methodologies to be:

- driven by economic principles
  - based on a strong theoretical foundation, informed by empirical analysis;
- fit for purpose;
  - able to perform well in estimating the cost of debt and the cost of equity over the regulatory years of the access arrangement period;
- implemented in accordance with best practice;
  - supported by robust, transparent and replicable analysis that is derived from available, credible datasets;
  - based on quantitative modelling that is sufficiently robust as to not be unduly sensitive to small changes in the input data;
  - based on quantitative modelling which avoids arbitrary filtering or adjustment of data, which does not have a sound rationale;
- capable of reflecting changes in market conditions and able to incorporate new information as it becomes available;
- supportive of specific regulatory aims; and thereby:
  - recognise the desirability of consistent approaches to regulation across industries, so as to promote economic efficiency;
  - seek to achieve rates of return that would be consistent with the outcomes of efficient, competitive markets;
  - ensure that the net present value of returns is sufficient to cover a service providers' efficient expenditures (the 'NPV=0' condition);
  - provide incentives to finance efficiently;
  - promote simple approaches over complex approaches where appropriate;
  - promote reasoned, predictable and transparent decision making;
  - enhance the credibility and acceptability of a decision.

3 Overall rate of return

36. The following elements will be adopted by the Authority for its future regulatory decisions.

A nominal post tax model

37. The Authority will apply an explicit nominal post tax modelling framework for its future decisions.

38. The Authority considers that the Australian Energy Regulator's (**AER**) Post Tax Revenue Model (**PTRM**), or a similar model, could provide a basis for future access arrangement determinations.[23] The PTRM would enable the Authority to utilise a nominal vanilla weighted average cost of capital (**WACC**) for the rate of return.

39. The PTRM deals with tax explicitly through operating cash flows, which is therefore consistent with the use of the nominal vanilla WACC.

Components of the rate of return

40. The Authority will adopt a weighted average cost of capital (WACC) for a benchmark efficient entity in its simplest 'vanilla' form, expressed as:

$$WACC_{vanilla} = E(r_e)\frac{E}{V} + E(r_d)\frac{D}{V} \qquad (1)$$

where

$E(r_e)$ is the expected return on equity;

$E(r_d)$ is the expected return on debt;

$\frac{E}{V}$ is the proportion of equity in total financing (comprising equity and debt; and

$\frac{E}{D}$ is the proportion of debt in total financing.

The term of the WACC

41. The term of the estimates for the rate of return will be consistent with the term of the regulatory period.

42. Accordingly, as the term of the regulatory period for the Authority's gas pipeline and networks decisions is five years, the term of its estimates for the rate of return will be five years.

[23] As noted in the Authority's Consultation Paper, there will be a number of transitional issues in moving from a real model to a nominal model, particularly with regard to tax depreciation. However, these issues are outside the scope of this Rate of Return Guideline.

Point estimates or ranges

43. The Authority will establish point estimates at the parameter level. These point estimates may be determined from within a range, or derived directly. Such point estimates would then inform a single point estimate for an estimation method or financial model.

44. Similarly, the Authority will establish point estimates at the level of the return on equity and the return on debt. These point estimates may be derived from a single estimation method, or from a range informed by multiple estimation methods, financial models, market data or other evidence.

45. Where single point estimates are derived from a range, the Authority recognises that it may be appropriate in some circumstances to adopt a formal weighting approach to inform the final estimate. In other cases, the Authority will need to exercise its judgment, articulating any reasons that inform its decisions.

46. The use of a single point estimate for the return on equity and the return on debt will lead to a single point estimate for the rate of return. The single point estimate of the rate of return will be facilitated by a single point estimate of the gearing level.

Requirement to meet the allowed rate of return objective

47. The Authority will consider appropriate tests of reasonableness for the outcomes of the WACC models or approaches. The Authority notes that tests of reasonableness need to be interpreted with care, to ensure that any comparisons are made on a transparent and consistent basis.

4 Benchmark and compensation for risk

48. The allowed rate of return objective is set out at NGR 87(3):[24]

> 87(3) The *allowed rate of return objective* is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services (the *allowed rate of return objective*).

49. The wording of the allowed rate of return objective requires that the rate of return is to be based on the:

- efficient financing costs; of
- a benchmark efficient entity; with
- a similar degree of risk as the service provider in respect of the provision of reference services.

Efficient financing costs

50. Financial markets will provide the observations required to evaluate the efficient financing costs of the benchmark efficient entity.

[24] Australian Energy Market Commission 2012, *National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012 No. 3,* www.aemc.gov.au, 87(3).

51. The Authority will constrain the estimation boundaries for the rate of return to domestic financial markets.

52. The requirement for internal consistency means that a single definition of the finance market is relevant. The Authority considers that it is desirable that all parameters of the rate of return be estimated based on the Australian domestic market.

The benchmark efficient entity

53. The benchmark efficient entity is defined as:

> A 'pure-play' regulated gas network business operating within Australia without parental ownership, with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

54. The Authority will base its estimates of efficient financing costs on averages derived from samples of comparator firms with efficient financing costs that are judged to be 'similar' to a single benchmark efficient entity for the provision of gas pipeline and network services in Australia.

Accounting for risk

55. The Authority will use its judgment to determine whether it needs to adjust the parameters, the return on equity, the return on debt, or the overall rate of return, in order to account for any material difference in risks faced by the ('average') benchmark efficient entity as compared to the regulated entity providing the reference services.

56. The Authority considers that the key risks it will need to consider in this evaluation will be those which have the potential to introduce material differences in the exposure to systematic risk. The Authority considers that, in the context of gas pipelines and networks, it is likely that these differential risks would relate principally to downstream demand risk. This would recognise that some gas pipelines are more exposed to the business cycle through commodity prices than other energy networks.

5 Gearing

57. The Authority considers that gearing should be determined from the average gearing level of a benchmark sample of Australian utility businesses subject to similar risk as the regulated entity in providing the reference services.

58. Companies included in the benchmark sample used to derive a benchmark gearing level for gas regulated businesses must satisfy three criteria. First, the company must be a network service provider in the gas and/or electricity industry in Australia. Second, the company must be listed so that the market value of its equity can be estimated using available data sources such as Bloomberg. Third, data on the values of debt and equity must be available.

59. The Authority's recent analysis using using this method with an updated data set from 2008 to 2012 indicates that a benchmark gearing level of 60 per cent debt is appropriate. This benchmark gearing of 60 per cent has consistently been used by Australian economic regulators over the past decade for their regulatory decisions.

6 Return on debt

60. The Authority will base its estimates of the return on debt on a risk premium over and above the risk free rate:

Return on Debt = Risk Free Rate + Debt Risk Premium

61. To reflect prevailing conditions, the Authority will use an estimate of the risk free rate just prior to the update period. The Authority is of the view that this 'on-the-day' approach for determining the cost of debt is the approach that best meets the requirements of the NGL and the allowed rate of return objective.

62. The Authority will update the on-the-day estimate of the risk free rate – each year on the anniversary of the commencement date – and publish the resulting return on debt on its website.

63. The debt risk premium will be derived based on that from an observed sample of comparator firms with similar credit ratings as the benchmark efficient entity. The similar credit rating provides for a similar degree of risk in providing the reference services.

64. The debt risk premium will be estimated once, at the commencement of the regulatory period. This estimate will apply for each regulatory year and will not be annually updated.

65. The return on debt estimated for the first regulatory year from the sum of the risk-free rate and the debt risk premium will apply for the duration of the regulatory period.

66. The Authority considers that it may be preferable for changes arising from the annual update to the risk free rate to be transmitted to tariffs in each regulatory year, as part of the annual tariff variation mechanism. The Authority intends to consider this issue further, in particular the construction of an automatic formula, prior to the finalisation of these guidelines.

7 Risk free rate of return

67. The Authority notes there are three key issues to address when estimating the nominal risk-free rate of return: (i) the choice of proxy for "risk-free" assets; (ii) the term to maturity of a risk-free rate; and (iii) the averaging period.

68. The Authority considers that Commonwealth Government Security (**CGS**) bonds are the best proxy for risk-free assets in Australia. Accordingly, observed yields from these CGS bonds – as reported daily by the RBA – will be used for the purpose of estimating a risk-free rate of return.

69. A 5-year term to maturity, informed by the observed yields on 5-year CGS bonds, will be used to estimate the risk free rate of return.

70. An averaging period of 20 trading days, prior to the release of the regulatory decision, will be adopted for the purpose of determining the risk-free rate of return in this rate of return guidelines.

8 Benchmark credit rating

71. The Authority considers that a median credit rating approach based on a benchmark sample of Australian utilities subject to similar risk is currently appropriate and fit for purpose for determining the benchmark credit rating.

72. Companies included in the benchmark sample must satisfy two criteria. First, the company must be a network service provider in the gas and/or electricity industry in Australia. Second, its credit rating must be based on an international rating agency such as Standard and Poor's or Moody's and publicly available.

73. The Authority's recent analysis indicates that gas businesses face marginally higher risks in comparison with electricity businesses in Australia. The Authority's analysis also shows that the credit rating for Australian gas businesses is within the BBB-/BBB/BBB+ band. However, the Authority is of the view that research is required to ensure that the determination of the benchmark credit rating for Australian regulated businesses is more robust.

9 Debt risk premium

74. The Authority is of the view that it is appropriate to use the bond-yield approach together with the joint-weighting mechanism to estimate the debt risk premium.

75. The debt risk premium derived from the bond-yield approach will be based on the observed yields of relevant Australian corporate bonds, taken from Bloomberg, that qualify for inclusion in the benchmark sample. In addition, the Authority notes that UBS provides pricing for floating rate notes which is included in the Authority's bond-yield approach. As such, for the purpose of this rate of return guidelines, USB pricing will be considered, together with Bloomberg, in the estimates of the debt risk premium.

76. The weighted average cost of debt from the benchmark sample will be derived using two key parameters of Australian corporate bonds: (i) the term to maturity; and (ii) the amount at issuance.

10 Return on equity

77. The Authority considers that the Sharpe-Lintner Capital Asset Pricing Model (**CAPM**) is the only model for determining the return on equity that meets its criteria for acceptability in the Australian context, at the current time.

78. The CAPM directly estimates the required return on the equity share of an asset as a linear function of the risk free rate plus a component to reflect the risk premium that investors would require over the risk free rate:

$$R_e = R_f + \beta_e\left(R_m - R_f\right)$$

where:

- R_e is the required rate of return on equity;
- R_f is the risk-free rate;
- β_e is the equity beta that describes how a particular portfolio i will follow the market which is defined as:

$$\beta_e = \text{cov}\left(r_i, r_M\right)/\text{var}\left(r_M\right) \text{ and;}$$

- $\left(R_m - R_f\right)$ is the market risk premium (**MRP**).

11 Market risk premium

79. The Authority will consider various sources of evidence to derive a forward looking MRP. The Authority will consider four different approaches to derive an estimate of the MRP. These four approaches include:

- historical data on equity risk premium;
- surveys of market risk practice;
- qualitative information on the Australian financial markets around the time of the decisions; and
- other Australian regulators' current practice on the estimate of the MRP.

12 Equity beta

80. The Authority is of the view that the methodology set out in its 2013 study on the equity beta, as reported in the companion Draft Explanatory Statement, has demonstrated the following characteristics. First, the study is transparent and the outcomes can be reproduced by interested parties. Second, the rationales for selecting a sample and data period are transparent and supported by previous studies. Third, the 2013 study has employed various econometric techniques to ensure that estimates of equity beta are robust.

81. As a result, the Authority considers that its 2013 study, as reported in the companion Draft Rate of Returns Guidelines Explanatory Statement, satisfies its criteria for choice of method for the equity beta.

13 Debt and equity raising costs

Debt raising costs

82. Debt raising costs will be treated as financing expenses. As such, debt raising costs should be incorporated in the operating expense cash flows determined in the regulatory decisions.

83. Debt raising costs should only include the direct cost components recommended by Allen Consulting Group (ACG) in their 2004 report to the ACCC and accepted by Australian regulators since then. These costs will be recompensed in proportion to the average annual issuance, and will cover:

- gross underwriting fees: this includes management fees, selling fees, arrangement fees and the cost of an underwriter for the debt;
- legal and roadshow fees: this includes fees for legal documentation and fees involved in creating and marketing a prospectus;
- company credit rating fees: a credit rating is generally required for the issue of a debt raising instruments, a company is charged annually by the credit rating agency for the services of providing a credit rating;
- issue credit rating fees: a separate credit rating is obtained for each debt issue;
- registry fees: the maintenance of the bond register; and
- paying fees: payment of a coupon and principal to the security holder on behalf of the issuer.

84. Indirect costs are not considered appropriate to be included in the estimate of the debt raising costs.

85. In addition, a swap allowance of 2.5 basis points will be awarded to firms on the whole of the debt portfolio to compensate for the cost of conducting hedging for the exposure to movements in the risk-free rate.

Equity raising costs

86. The Authority considers that an allowance for the transactions costs of raising equity is justified where an adjustment is required to maintain the debt to equity ratio.

87. Equity raising costs will be estimated as follows:

- retained earnings of 30 per cent of after-tax profits will be available to inrease equity at zero cost;
- dividends will be assumed to be paid at the benchmark payout ratio of 70 per cent of after-tax profits, consistent with the estimation of gamma;
- 25 per cent of dividends paid out will be treated as being reinvested through Dividend Re-investment Plans, with an equity raising cost allowance of one per cent applied;
- any further required equity is raised at the Seasoned Equity Offering cost of 3 per cent – with these costs added to the asset base and depreciated over the life of the assets.

88. SEO costs will be added to the regulated asset base, and depreciated over the life of the assets.

14 Gamma

89. The Authority considers that the dividend drop-off methodology is the most appropriate methodology for estimating theta, despite its shortcomings and methodological issues. In addition, the Authority is of the view that the best way to estimate theta involves using a number of dividend drop off studies so as to avoid problems that may arise if only one study is considered.

15 Inflation

90. The Authority considers that its current approach is appropriate for deriving expected rates of inflation. In this approach, both nominal and real risk-free rates of return are directly observed from the financial markets. As such, these estimates reflect the market expectation for inflation.

91. However, the Authority is aware that under some circumstances this approach may fail. For example, during the recent global financial crisis when there were liquidity concerns in the Treasury's indexed bonds market which lead to a bias in the estimate of a real risk-free rate. In such circumstances, another approach such as the RBA's Inflation Forecast approach method may be preferred.

92. The Authority will estimate the expected inflation rate consistent with the estimate of the risk-free rate by adopting an averaging period of 20 trading days prior to an access arrangement. In addition, the term of the expected inflation rate is also 5 years, which is consistent with the terms of the risk-free rate of return and the cost of debt.