Public Version

Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System

Submitted by ATCO Gas Australia Pty Ltd

14 October 2014

Economic Regulation Authority
WESTERN AUSTRALIA

This document is available from the Economic Regulation Authority's website at www.erawa.com.au. For further information, contact:

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Contents

Tables

Figures

Draft Decision

Background

1. On 17 March 2014, ATCO Gas Australia Pty Ltd (**ATCO**) submitted its proposed revised access arrangement, access arrangement information and other supporting information for the Mid-West and South-West Gas Distribution System (**GDS**) to the Authority. The proposed revised access arrangement, access arrangement information and supporting information are available on the Authority's website.

2. The role of the Authority is to determine whether the proposed revisions comply with the requirements of the National Gas Law (**NGL**) and National Gas Rules (**NGR**), as implemented in Western Australia by the *National Gas Access (WA) Act 2009* (**NGL**(**WA**)).

3. The Authority notes that the current access arrangement has a review submission date of 1 July 2013 meaning that ATCO would have had to lodge its access arrangement proposal to the Authority on or before this date.[1] However, as a result of the amendment to rule 87 of the NGR by the Australian Energy Market Commission (**AEMC**) in 2012, the Authority was required to exercise its power under rule 52(3) to extend the period for ATCO to submit its access arrangement proposal. Furthermore, clause 35 of schedule 1 to the NGR, extended the period for ATCO to submit its access arrangement proposal to three months after the date the Authority's Rate of Return Guidelines was published. A notice to this effect was published concurrently with the Authority's Rate of Return Guidelines on 16 December 2013.[2] The Authority notes that as 16 March 2014 was a Sunday, under clause 28(3) to schedule 2 of the NGL(WA), this extended the review submission date to 17 March 2014.

4. ATCO's proposed revised access arrangement covers the period 1 July 2014 to 31 December 2019 (herein referred to as **AA4** or fourth access arrangement period). ATCO's current access arrangement (**AA3**) applies until a new proposed access arrangement is approved by the Authority.

5. The purpose of an access arrangement is to provide details about the terms and conditions, including price, upon which an independent third party (user) can gain access to the pipelines for the transport of gas.

6. The Authority invited submissions from interested parties on the revised access arrangement by publishing an initiating notice on 4 April 2014. On 2 May 2014, the Authority published an Issues Paper, in order to assist interested parties in understanding some of the significant issues to be addressed by the Authority in determining whether to approve or not approve the proposed revised access arrangement. Interested parties were invited to make submissions on the GDS Access Arrangement Proposal by 21 May 2014.

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1 Access Arrangement for the Mid-West and South-West Gas Distribution, 25 June 2012.

2 Notice, Final Guidelines, Rate of Return Guidelines for Gas Transmission and Distribution Networks

7. The following parties provided submissions on ATCO's proposed revised GDS access arrangement by the closing date:

   - Alinta Energy (Alinta)
   - Wesfarmers Kleenheat Gas Pty Ltd (Kleenheat)

8. The submissions from the two parties can be found on the Authority's website.[3]

9. As required by rule 59(1) of the NGR and section 65(a) of the NGL(WA), in arriving at this Draft Decision the Authority has considered the public submissions it received within the timeframe specified in its initiating notice. The details of the public submissions that were received and considered by the Authority are set out in this Draft Decision.

10. Under rule 59 of the NGR, the Authority is required to make a draft decision that indicates whether the Authority is prepared to approve the access arrangement revision proposal as submitted and, if not, the nature of amendments that are required in order to make the proposal acceptable to the Authority. An access arrangement draft decision must include a statement of the reasons for the decision.

11. After considering submissions received from interested parties and advice from its technical advisors, the draft decision of the Authority is to not approve the access arrangement revision proposal. The Authority's reasons for not approving the access arrangement revision proposal are set out in this Draft Decision. Each of the required amendments is discussed in the relevant sections of this Draft Decision.

12. The amendments that are required to be made to the proposed access arrangement revisions before the Authority will approve it are listed in Appendix 1. For the purposes of clarity, the required amendments are also indicated in the reasons for this Draft Decision at the point at which each relevant element of the proposed revised access arrangement is considered.

13. Under rule 59(3) of the NGR, the Authority is required to fix a period (revision period) within which ATCO may, under rule 60, submit additions or other amendments to the access arrangement revisions proposal to address matters raised in this Draft Decision. The Authority fixes the revision period at six weeks from the date of this Draft Decision, expiring at 4.00 pm WST on 25 November 2014.

14. The Authority also invites submissions on this Draft Decision for a period of 20 business days following the revision period allowed to ATCO, consistent with the requirements of rule 59(5)(iii) of the NGR. The closing date for submissions is 4:00 pm WST on 23 December 2014.

15. Under rule 62 of the NGR, the Authority will consider any submissions received on this Draft Decision and make a final decision to approve, or to refuse to approve, the proposed revised access arrangement (or revised proposed access arrangement revisions if submitted by ATCO).

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[3] http://www.erawa.com.au/gas/gas-access/mid-west-and-south-west-gas-distribution-system/access-arrangements/proposed-access-arrangement-for-period-2014-2019/public-submissions

Overview

16. The GDS has been a regulated pipeline for third party access since 18 July 2000. The first access arrangement for the GDS was approved by the Authority's predecessor, the Office of Gas Access Regulation under the *National Third Party Access Code for Natural Gas Pipeline Systems* (**the Code**). Subsequent access arrangements for the GDS have since been approved by the Authority under the Code for the second access arrangement period and the NGL(WA) and NGR for the third access arrangement period.

17. The GDS consists of gas reticulation networks serving Geraldton, Bunbury, Busselton, Harvey, Pinjarra, Brunswick Junction, Capel and the Perth Greater Metropolitan Area including Mandurah. These combined networks constitute approximately 13,500km of gas mains and associated infrastructure.

18. ATCO was formed on 29 July 2011, when ATCO Ltd through 100 per cent owned entities, acquired 100 per cent of the shares in WA Gas Networks Pty Ltd (**WAGN**) from Brookfield Infrastructure Group and DUET Group.

19. ATCO Ltd controls ATCO Group, which is a Canadian based international group of companies that is engaged in the areas of structures and logistics, energy and technologies.[4]

20. ATCO is a privately owned subsidiary of Canadian Utilities Limited that is principally controlled by ATCO Ltd. Prior to the acquisition of the GDS, the access arrangement for AA3 was submitted by WAGN.[5]

ATCO's Proposal

21. ATCO has proposed to increase reference tariffs as a result of:

    - A proposed increase in operating expenditure by 48 per cent, from $284.48 million[6] in the current access arrangement period (a four and a half year period) to $421.33 million[7] for the fourth access arrangement period (a five and a half year period). ATCO has identified the main drivers for the proposed increase in forecast operating expenditure as safety requirements and network growth. Another driver for ATCO's operating expenditure is its gas marketing strategy.
    - A proposal to spend $606.92 million[8] of capital expenditure over the fourth access arrangement period, which is 124 per cent higher than its proposed conforming capital expenditure for the current access arrangement period.[9] ATCO has identified the main drivers for the proposed increase as safety requirements and network growth. An additional driver for ATCO's capital expenditure proposal is IT expenditure to replace obsolete IT systems.

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4 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 23.

5 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 17.

6 Real $ million at 30 June 2014.

7 Real $ million at 30 June 2014.

8 Real $ million at 30 June 2014.

9 The current access arrangement period is 4.5 years. The fourth access arrangement will be 5.5 years.

- A forecast depreciation of the capital base at $116.22 million[10] for the fourth access arrangement period. ATCO proposes that the depreciation schedule be determined by transitioning to a different depreciation approach.

22. ATCO has proposed an approach to the rate of return that yields a Weighted Average Cost of Capital (**WACC**) of 8.53 per cent. ATCO proposes to depart from the Authority's Rate of Return guidelines in a number of areas.[11]

23. The Authority notes that ATCO has submitted two revised tariff models with accompanying access arrangement information tables since its initial access arrangement proposal was submitted on 17 March 2014. Its first revised tariff model on 30 July 2014 was for a revised forecast for unaccounted for gas (**UAFG**) costs resulting from the completion of a competitive tender to establish a gas supply contract for the fourth access arrangement period. The second revised tariff model on 1 September 2014 was for revised forecast IT costs as a result of a new IT service agreement.

Summary of Key Points

Draft Decision Key Points

24. The Authority has reviewed ATCO's proposed revised access arrangement for the fourth access arrangement period in accordance with the NGR and NGL, including the National Gas Objective. The Authority appointed a technical advisor, Energy Market Consulting associates (**EMCa**), to assist its review of ATCO's proposed capital and operating expenditure, in addition to related governance arrangements.

25. The Authority's key amendments to ATCO's proposed revised access arrangement for the fourth access arrangement period required by this Draft Decision are as follows:

- ATCO to develop an asset health key performance indicator, and propose a target for it for the fourth access arrangement period.
- Forecast operating expenditure for the fourth access arrangement period capped at $347.48 million[12], with main adjustments addressing ATCO's proposed corporate operating expenditure, IT operating expenditure and UAFG operating expenditure.
- Forecast capital expenditure for the fourth access arrangement period capped at $286.44 million[13], with main adjustments addressing ATCO's proposed growth and sustaining capital expenditure.
- Rate of return revised to 5.94 per cent.
- ATCO to adopt the current cost accounting approach to depreciation, based on the indexed value of the regulatory asset base.
- ATCO to update its calculation of the estimated cost of corporate income tax by excluding capital contributions and commercial meters from the tax asset base, updating asset lives and applying accelerated depreciation to new capital expenditure in the fourth access arrangement period.

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10 Real $ million at 30 June 2014.

11 http://www.erawa.com.au/infrastructure-access/gas-access/rate-of-return-guidelines

12 Real $ million at 30 June 2014.

13 Real $ million at 30 June 2014.

- ATCO to maintain the current tariff variation mechanism for B2 and B3 customers for the fourth access arrangement period as in the approved current access arrangement, and exclude cost pass-throughs for regulatory costs.
- ATCO to recalculate the B3 standing charge, and implement its increase gradually from 2015 to 2019.
- ATCO to decrease all other tariffs in line with the decreased revenues as per this Draft Decision, and increase them by inflation from 2016 to 2019.

26. Table 1 and Table 2 compare key figures in ATCO's proposal with the Draft Decision.

Table 1 Comparison of ATCO's Proposal and Authority Draft Decision – Total Revenue

Component	ATCO Proposal	Draft Decision
Total Revenue (nominal $ millions)	1,208.50	836.10
Forecast Operating Expenditure (real $ millions in June 2014)	421.33	347.48
Forecast Capital Expenditure (real $ millions in June 2014)	606.92	286.44
WACC (per cent)	8.53	5.94
Gamma	0.25	0.50
Depreciation (nominal $ millions)[14]	263.44	231.87
Estimated Cost of Corporate Income Tax (nominal $ millions)	44.35	4.07
Return on Working Capital (nominal $ millions)	1.26	0.55

Source: ATCO Gas Australia, Tariff Model, September 2014. ERA, GDS Tariff Model, October 2014.

Table 2 Comparison of ATCO's Proposal and Authority Draft Decision – Tariffs (Nominal)

Annual Change	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019
ATCO Proposal					
A1, A2 and B1 Tariffs	5.1%	5.1%	5.1%	5.1%	5.1%
B2 Standing charge	7.1%	5.1%	5.1%	5.1%	5.1%
B2 Usage Charge 100 GJ	4.2%	5.1%	5.1%	5.1%	5.1%
B2 Usage Charge > 100 GJ	4.2%	5.1%	5.1%	5.1%	5.1%
B3 Standing Charge	90.0%	5.1%	5.1%	5.1%	5.1%
B3 Usage Charge >2<10 GJ	(28.6%)	5.1%	5.1%	5.1%	5.1%
B3 Usage Charge >10 GJ	(28.6%)	5.1%	5.1%	5.1%	5.1%
Draft Decision					
A1, A2 and B1 Tariffs	(30.0%)	2.2%	2.2%	2.2%	2.2%
B2 Standing charge	(30.0%)	2.2%	2.2%	2.2%	2.2%
B2 Usage Charge 100 GJ	(30.0%)	2.2%	2.2%	2.2%	2.2%
B2 Usage Charge > 100 GJ	(30.0%)	2.2%	2.2%	2.2%	2.2%
B3 Standing Charge	10.8%	10.2%	9.6%	9.1%	8.7%
B3 Usage Charge >2<10 GJ	(28.3%)	(4.1%)	(4.5%)	(5.0%)	(5.5%)
B3 Usage Charge >10 GJ	(38.5%)	(4.1%)	(4.5%)	(5.0%)	(5.5%)

Source: ATCO Gas Australia, Tariff Model, September 2014. ERA, GDS Tariff Model, October 2014.

Summary of Submission Issues

27. The Authority notes some issues in relation to ATCO's proposed revised access arrangement submission for the fourth access arrangement period.

28. ATCO was late in submitting to the Authority the GDS statutory and regulatory accounts[15], and Cost Allocation Method (**CAM**). ATCO submitted the proposed revised access arrangement on 17 March 2014. ATCO provided statutory accounts on 16 July 2014, and regulatory accounts on 7 August 2014. ATCO submitted its

proposed CAM to the Authority on 8 August 2014. The accounts and CAM are essential for the Authority's verification of ATCO's proposed expenditure in the access arrangement. The Authority addresses this in the Operating Expenditure and Opening Capital Base chapters of this Draft Decision.

29. The Authority also notes inconsistencies in relation to information provided in the access arrangement information and information provided by ATCO in responses to questions by the Authority or EMCa. The Authority addresses these inconsistencies in the Total Revenue chapters of this Draft Decision.

Decision Making Framework

Regulatory Framework

30. The purpose of an access arrangement for a gas pipeline is to provide the details of the terms and conditions, including price, upon which an independent third party (user) can gain access to the pipeline.

31. The requirements for an access arrangement are established by the NGL and NGR as enacted by the *National Gas (South Australia) Act 2008* and as implemented in Western Australia by the *National Gas Access (WA) Act 2009* as the NGL(WA).

32. Under rule 100 of the NGR, all provisions of an access arrangement are required to be consistent with the National Gas Objective.

33. The National Gas Objective is defined in section 23 of the NGL(WA) as:

> 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.

34. Sections 28(1) and (2) of the NGL(WA) specify the manner in which the Authority must perform or exercise its economic regulatory functions or powers.

> 28. Manner in which [Authority] must perform or exercise [Authority] economic regulatory functions or powers
>
> 1) The [Authority] must, in performing or exercising an [Authority] economic regulatory function or power, perform or exercise that function or power in a manner that will or is likely to contribute to the achievement of the National Gas Objective.
>
> 2) In addition, the [Authority] –
>
> a) must take into account the revenue and pricing principles –
>
> b) when exercising a discretion in approving or making those parts of an access arrangement relating to a reference tariff; or
>
> c) when making an access determination relating to a rate or charge for a pipeline service; and

[14] ATCO's proposal does not exclude the inflationary gain of $136.11 million that it proposed to remove from depreciation. The Authority removes this inflationary gain as a separate line item in the building blocks.

[15] Accounts cover year ending 30 June 2011, six months ending 31 December 2011, and years ending 31 December 2012 and 31 December 2013.

d) may take into account the revenue and pricing principles when performing or exercising any other [Authority] economic regulatory function or power, if the [Authority] considers it appropriate to do so.

35. During the course of the third access arrangement, the Australian Energy Market Commission (**AEMC**) made numerous changes to the NGR. In particular, rule 87 of the NGR has been updated extensively. The Authority addressed some of these changes in its Rate of Return Guidelines published on 16 December 2013.

36. At the time of submission for the proposed revisions for the third access arrangement by WAGN, rule 87 of the NGR stated the following:[16]

87. Rate of return

1) The rate of return on capital is to be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.

2) In determining a rate of return on capital:

a) it will be assumed that the service provider:

b) meets benchmark levels of efficiency; and

c) uses a financing structure that meets benchmark standards as to gearing and other financial parameters for a going concern and reflects in other respects best practice; and

d) a well accepted approach that incorporates the cost of equity and debt, such as the Weighted Average Cost of Capital, is to be used; and a well accepted financial model, such as the Capital Asset Pricing Model, is to be used.

37. The current version of the NGR states the following for rule 87:[17]

87. Rate of return

1) Subject to rule 82(3), the return on the projected capital base for each regulatory year of the access arrangement period is to be calculated by applying a rate of return that is determined in accordance with this rule 87 (the allowed rate of return).

2) The allowed rate of return is to be determined such that it achieves the allowed rate of return objective.

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).

4) Subject to subrule (2), the allowed rate of return for a regulatory year is to be:

a) a weighted average of the return on equity for the access arrangement period in which that regulatory year occurs (as estimated under subrule (6)) and the return on debt for that regulatory year (as estimated under subrule (8)); and

b) determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits referred to in rule 87A.

5) In determining the allowed rate of return, regard must be had to:

a) relevant estimation methods, financial models, market data and other evidence;

[16] National Gas Rules 87 (Version 10).

[17] National Gas Rules 87 (Version 22).

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

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

Return on equity

6) The return on equity for an access arrangement period is to be estimated such that it contributes to the achievement of the allowed rate of return objective.

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

Return on debt

8) The return on debt for a regulatory year is to be estimated such that it contributes to the achievement of the allowed rate of return objective.

9) The return on debt may be estimated using a methodology which results in either:

a) the return on debt for each regulatory year in the access arrangement period being the same; or

b) the return on debt (and consequently the allowed rate of return) being, or potentially being, different for different regulatory years in the access arrangement period.

10) Subject to subrule (8), the methodology adopted to estimate the return on debt may, without limitation, be designed to result in the return on debt reflecting:

a) the return that would be required by debt investors in a benchmark efficient entity if it raised debt at the time or shortly before the time when the [Authority's] decision on the access arrangement for that access arrangement period is made;

b) the average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the access arrangement period; or

c) some combination of the returns referred to in subrules (a) and (b).

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.

12) If the return on debt is to be estimated using a methodology of the type referred to in subrule (9)(b) then a resulting change to the service provider's total revenue must be effected through the automatic application of a formula that is specified in the decision on the access arrangement for that access arrangement period.

Rate of return guidelines

13) The [Authority] must, in accordance with the *rate of return consultative procedure*, make and publish guidelines (the *Rate of Return Guidelines*).

14) The Rate of Return Guidelines must set out:

a) the methodologies that the [Authority] proposes to use in estimating the *allowed rate of return*, including how those methodologies are proposed to result in the determination of a return on equity and a return on debt in a way that is consistent with the *allowed rate of return objective*; and

b) the estimation methods, financial models, market data and other evidence the [Authority] proposes to take into account in estimating the return on equity, the return on debt and the value of imputation credits referred to in rule 87A.

15) There must be *Rate of Return Guidelines* in force at all times after the date on which the [Authority] first publishes the *Rate of Return Guidelines* under these rules.

16) The [Authority] must, in accordance with the rate of return consultative procedure, review the Rate of Return Guidelines:

a) at intervals not exceeding three years, with the first interval starting from the date that the first Rate of Return Guidelines are published under these rules; and

b) at the same time as it reviews the Rate of Return Guidelines under clauses 6.5.2 and 6A.6.2 of the National Electricity Rules.[18]

17) The [Authority] may, from time to time and in accordance with the rate of return consultative procedure, amend or replace the Rate of Return Guidelines.

18) The Rate of Return Guidelines are not mandatory (and so do not bind the [Authority] or anyone else) but, if the [Authority] makes a decision in relation to the rate of return (including in an access arrangement final decision or an access arrangement final decision) that is not in accordance with them, the [Authority] must state, in its reasons for the decision, the reasons for departing from the guidelines.

19) If the Rate of Return Guidelines indicate that there may be a change of regulatory approach by the decision maker in future decisions, the guidelines should also (if practicable) indicate how transitional issues are to be dealt with.

38. In addition to the NGL(WA) and NGR, the Authority must also take into consideration the *National Gas Access (WA) (Local Provisions) Regulations 2009* (**WA Local Regulations**). These regulations contain provisions, under Part 2, which deal with the impact of reference tariffs on 'small users' (retailers) and 'small use customers'.

Content of an Access Arrangement

39. Under section 2 of the NGL(WA), a "full access arrangement" means an access arrangement that:

a) provides for price or revenue regulation as required by the NGR; and

b) deals with all other matters for which the NGR require provisions to be made in an access arrangement.

40. The required content of a full access arrangement proposal is specified in rule 48 of the NGR.

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18 The National Electricity Rules are not applicable in Western Australia.

48. Requirements for full access arrangement (and full access arrangement proposal)

1) A full access arrangement must:

a) identify the pipeline to which the access arrangement relates and include a reference to a website at which a description of the pipeline can be inspected; and

b) describe the pipeline services the service provider proposes to offer to provide by means of the pipeline; and

c) specify the reference services; and

d) specify for each reference service:

i) the reference tariff; and

ii) the other terms and conditions on which the reference service will be provided; and

e) if the access arrangement is to contain queuing requirements – set out the queuing requirements; and

f) set out the capacity trading requirements; and

g) set out the extension and expansion requirements; and

h) state the terms and conditions for changing receipt and delivery points; and

i) if there is to be a review submission date – state the review submission date and the review commencement date; and

j) if there is to be an expiry date – state the expiry date.

2) This rule extends to an access arrangement proposal consisting of a proposed full access arrangement.

41. As per rule 43 of the NGR, the service provider must submit access arrangement information when submitting a full access arrangement proposal. Rule 42 of the NGR states that access arrangement information is information that is reasonably necessary for users to understand the background to the access arrangement, and the basis and derivation of various elements of the access arrangement.

42. The ATCO access arrangement is a full access arrangement, for which a proposed revised access arrangement and a revised access arrangement information have been submitted by ATCO.

Key Dates and Identification of the Pipeline

Regulatory Requirements

43. Rule 48(1)(a) of the NGR requires an access arrangement to identify the pipeline to which the access arrangement relates and to make reference to a website where a description of the pipeline can be inspected.

44. Rule 49(1)(a) of the NGR requires a full access arrangement contain a review submission date and a revision commencement date but must not contain an expiry date.

45. Rule 50(1) of the NGR states that as a general rule, a review submission date will fall four years after the access arrangement takes effect and a revision commencement date will fall five years after the access arrangement takes effect. Under rule 50(2) of the NGR, the Authority must accept the service provider's proposed dates if it is in

accordance with rule 50(1) of the NGR. If the service provider's proposed dates do not conform with rule 50(1) of the NGR, rule 50(4) of the NGR allows the Authority to approve dates that are consistent with the National Gas Objective (**NGO**) and the revenue and pricing principles.

ATCO's Proposed Revisions

46. ATCO has referred to the pipeline as the AGA GDS at section 3 of the proposed revised access arrangement. The current access arrangement refers to the pipeline as the WAGN GDS, as that access arrangement was submitted by WAGN.

47. ATCO has provided a website address (http://www.atcogas.com.au/About-Us/Coverage-Maps) for a description of the pipeline in the proposed revised access arrangement.[19] The website address contained in the current access arrangement is for the previous owner.

48. ATCO has proposed a review submission date of 1 September 2018 and a revision commencement date of 1 January 2020 at clause 2.2 of the proposed revised access arrangement.

49. The dates proposed by ATCO for the fourth access arrangement result in a five and a half year access arrangement period beginning at a new financial year and ending at the end of a calendar year. ATCO states that the change in reporting period is to "simplify adjustments and comparisons between financial reporting required by the ERA".[20]

Submissions

50. None of the submissions made to the Authority on the proposed revisions to the access arrangement address the identification of the pipeline or key dates.

Considerations of the Authority

51. The Authority considers that ATCO has appropriately identified the pipeline to which the access arrangement relates and has provided a website at which a description of the pipeline can be inspected. The Authority notes that the minor amendments made by ATCO for the pipeline identification and website address in the proposed revised access arrangement were necessary in order to reflect the change in ownership.

52. The Authority is satisfied that ATCO has met the requirements of rule 49(1)(a) of the NGR in providing both a review submission date and a revision commencement date.

53. The Authority notes that the review submission date and commencement date do not conform to the general requirements of rule 50(1) of the NGR. However, the Authority has considered ATCO's proposal and is satisfied that the dates are consistent with the NGO and revenue pricing principles as per rule 50(4) of the NGR.

54. The Authority approves the identification of the pipeline and key dates as set out in clauses 2 and 3 of the proposed revised access arrangement.

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[19] ATCO Gas Australia, *Access Arrangement for the Mid-West and South-West Gas Distribution System*, 17 March 2014, section 3, p. 6.

[20] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 21.

Pipeline Services

Regulatory Requirements

55. A "pipeline service" is defined under section 2 of the NGL(WA).

> Pipeline service means –
>
> a) a service provided by means of a pipeline, including –
>
> i) a haulage service (such as firm haulage, interruptible haulage, spot haulage and backhaul); and
>
> ii) a service providing for, or facilitating, the interconnection of pipelines; and
>
> b) a service ancillary to the provision of a service referred to in paragraph (a), but does not include the production, sale or purchase of natural gas or processable gas.

56. Under rule 48(1) of the NGR, a full access arrangement proposal must:

> a) identify the pipeline to which the access arrangement relates and include a reference to a website at which a description of the pipeline can be inspected; and
>
> b) describe the pipeline services the service provider proposes to offer to provide by means of the pipeline; and
>
> c) specify the reference services; and
>
> d) specify for each reference service:
>
> i) the reference tariff; and
>
> ii) the other terms and conditions on which the reference service will be provided.

57. Rule 101 of the NGR requires a full access arrangement to specify all reference services.

> 1) A full access arrangement must specify as a reference service:
>
> a) at least one pipeline service that is likely to be sought by a significant part of the market; and
>
> b) any other pipeline service that is likely to be sought by a significant part of the market and which the [Authority] considers should be specified as a reference service.

ATCO's Proposed Revisions

58. Clause 4.1 of the proposed revised access arrangement defines pipeline services as reference services (haulage services) and non-reference services.[21]

59. Section 4 of the proposed revised access arrangement does not specifically define or refer to ancillary services as reference services. However, the current access arrangement defines ancillary services as reference services at clause 4.1(b). The five ancillary services included in section 4 of the current access arrangement are still present in the proposed revised access arrangement at clauses 4.7 to 4.11.

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[21] ATCO Gas Australia, *Access Arrangement for the Mid-West and South-West Gas Distribution System*, 17 March 2014, section 4, p. 7.

60. The descriptions of the five reference services (haulage services) under the proposed revised access arrangements are set out in clauses 4.2 (Service A1), 4.3 (Service A2), 4.4 (Service B1), 4.5 (Services B2) and 4.6 (Service B3).

61. ATCO has made minor updates to clauses 4.2 (Service A1) and 4.3 (Service A2) to reflect the change in ownership from WAGN to AGA. No other changes have been made to these clauses.

62. ATCO has updated clause 4.4 (Service B1) to include an option of allowing prospective users to take delivery of gas at a delivery point on the medium pressure/low pressure system using standard delivery facilities, which include a standard 18m^3/h meter or a standard meter with a badged capacity of more than 18m^3/h. Alternatively, prospective users can request user specific facilities as per the current access arrangement. Clause 4.4 (Service B1) has also been updated to reflect the change in ownership from WAGN to AGA.

63. Clauses 4.5 (Service B2) and 4.6 (Service B3) have been updated to include additional meter options. ATCO is proposing to offer users on Service B2 a standard meter with a badged capacity of less than 18m^3/h or the original standard 12m^3/h meter as per the current access arrangement. For Service B3, ATCO is proposing to offer users three meter options, being the original standard 8m^3/h meter per the current access arrangement, a standard 10m^3/h meter or a standard meter with a badged capacity of less than 12m^3/h.

64. In summary, the proposed reference services (haulage services) are pipeline services applicable in the following circumstances:

- Service A1: at the time of application the user reasonably anticipates taking delivery of gas at a delivery point on the GDS of 35 terajoules (**TJ**) or more of gas per year and requests a contracted peak rate of 10 gigajoules (**GJ**) or more of gas per hour. Also the user requests specific delivery facilities be installed.
- Service A2: at the time of application the user reasonably anticipates taking delivery of gas at a delivery point on the GDS of between 10 and 35 TJ/year; or requests a contracted peak rate of less than 10 GJ/hour; or an above 10 TJ determination has been, or is likely to be made under the Retail Market Rules. Also, the user requests specific delivery facilities be installed.
- Service B1: at the time of application the user reasonably anticipates taking delivery of gas at a delivery point on the GDS of less than 10TJ/year or requests a contracted peak rate of less than 10 GJ/hour. Prospective users can request user specific delivery facilities or can take delivery of gas at a delivery point on the medium pressure/low pressure system using standard delivery facilities, which include a standard 18m^3/h meter or a standard meter with a badged capacity of more than 18m^3/h.
- Service B2: the user requests a delivery of gas at a delivery point on the medium pressure/low pressure system using standard delivery facilities, which include a standard 12m^3/h meter or a standard meter with a badged capacity of less than 18m^3/h.
- Service B3: the user requests a delivery of gas at a delivery point on the medium pressure/low pressure system using standard delivery facilities, which include a standard 8m^3/h meter, a standard 10m^3/h meter, or a standard meter with a badged capacity of less than 12m^3/h.

65. The reference tariffs are Tariff A1, A2, B1, B2 and B3, which correspond to Services A1, A2, B1, B2 and B3 respectively. ATCO's reference tariffs are specified in Annexure A to the proposed revised access arrangement.

66. Other pipeline services that ATCO are proposing to offer include:[22]

a) Deregistering a delivery point (clause 4.7): a delivery point is permanently deregistered by removing the standard delivery facilities to the extent ATCO considers necessary; removing the delivery point in accordance with the Retail Market Rules; and removing the delivery point from the Delivery Point Register. This service is available for A1, A2, B1, B2 and B3 customers.

b) Applying a meter lock (clause 4.8): a lock is applied to the valve that comprises part of the standard delivery facilities to prevent gas from being received at the relevant delivery point. This service is available for B2 and B3 customers.

c) Removing a meter lock (clause 4.9): a lock that was applied to a valve comprising part of the standard delivery facilities to prevent gas from being received at the relevant delivery point is removed. This service is available for B2 and B3 customers.

d) Disconnecting a delivery point (clause 4.10): physically disconnecting a delivery point to prevent gas from being delivered to the delivery point. This service is available for B2 and B3 customers.

e) Reconnecting a delivery point (clause 4.11): reconnecting a delivery point to allow gas to be delivered to the delivery point. This service is available for B2 and B3 customers.

67. Clause 4.7 has been updated to reflect the change in ownership from WAGN to ATCO.

68. Annexure C specifies the reference tariffs and tariff variation mechanism for the pipeline services listed in clauses 4.7 to 4.11.

69. The other terms and conditions on which the pipeline services are to be supplied are set out in the Template Haulage Contract (Annexure E to the proposed revised access arrangement). The Template Haulage Contract contains schedules setting out terms and conditions specific to each reference service (Schedules 1, 2, 3, 4 and 5 correspond to Services A1, A2, B1, B2 and B3 respectively) and the other applicable pipeline services as per paragraph 66.

70. For non-reference services, clause 4.12 has been updated to reflect the change in ownership from WAGN to ATCO. No other changes have been made to this clause.

Submissions

71. None of the submissions made to the Authority on the proposed revisions to the access arrangement address ATCO's proposed pipeline services.

Considerations of the Authority

72. The Authority notes that the changes in wording to ATCO from WAGN in clauses 4.2, 4.3 and 4.4 were necessary to reflect the new owners of the GDS.

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[22] ATCO Gas Australia, *Access Arrangement for the Mid-West and South-West Gas Distribution System*, 17 March 2014, section 4, p. 9.

73. As discussed in paragraphs 62 and 63, ATCO has amended the revised proposed access arrangement to include standard delivery facilities (Service B1) and different metering options (Services B2 and B3). ATCO has forecasted that approximately 1 per cent of new Service B3 users will take up the new metering option. ATCO also states that the connection forecasts for Service B2 reflect a similar adjustment.[23] By offering additional meter options, which can handle an increased load, ATCO believes that users will be able to increase their consumption of gas without having to change over to a new service and incur an additional connection cost to cover the cost of the larger connection, meter box and meter.[24] The Authority has not received any submissions on this issue and has no reason to believe that these changes will have a negative impact for the current users and prospective users of these services.

74. The Authority notes that ATCO has made no changes to the description of the pipeline services in clauses 4.7 to 4.11, besides for the one minor update in clause 4.7 as discussed in paragraph 67.

75. The Authority approves the definitions of the pipeline services as set out in clauses 4.2 to 4.11 of the proposed revised access arrangement.

76. The Authority has received no submissions and has no other information available to it which suggests that the negotiated services referred to in clause 4.12 are likely to be sought by a significant part of the market. Therefore, the Authority considers that these services are non-reference services.

77. The Authority approves clause 4.12 of the proposed revised access arrangement.

78. As discussed in paragraph 59, there is no definition or reference to ancillary services throughout section 4 of the proposed revised access arrangement. However, ATCO does refer to these pipeline services as ancillary reference services in chapter 4 of its access arrangement information, in addition to providing a definition of ancillary services in the glossary to the access arrangement information.[25] Clause 4.1(b) of the current access arrangement specifically refers to ancillary services as reference services to be offered.

79. The Authority has sought clarification from ATCO as to whether ancillary services are reference services due to the inconsistency between the access arrangement and access arrangement information. ATCO has not provided the Authority with sufficient reasoning behind its decision to remove the definition of ancillary services from clause 4.1 whilst keeping the reference in the access arrangement information.[26] The Authority notes that in ATCO's response, ATCO does state that ancillary services are reference services, but this would not be clear to readers of the access arrangement unless they also refer to the glossary to the access arrangement information, the access arrangement information and the NGL(WA).

80. Section 2(b) of the NGL(WA) includes a reference to a "service ancillary" to the provision of a service in paragraph 2(a) of the NGL(WA) (haulage services). Accordingly, the Authority considers that it is necessary to define ancillary services as a reference service in the proposed revised access arrangement for clarity and to

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23 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 39.

24 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 39.

25 ATCO Gas Australia, *Glossary: Access Arrangement Information*, 17 March 2014, p. 1.

26 ATCO Gas Australia, *Email response to ERA1*, 25 March 2014.

remove any ambiguity that may arise. This will also ensure that there is consistency with the current access arrangement.

81. Furthermore, rule 101(1) of the NGR requires a full access arrangement to specify as a reference service "any other pipeline service that is likely to be sought by a significant part of the market". The Authority acknowledges ATCO's response that ancillary services are reference services, but again, this is not clear when reading section 4 of the access arrangement.[27]

82. For the reasons listed in paragraphs 78 to 81, the Authority does not approve clause 4.1 of the proposed revised access arrangement. The proposed revised access arrangement should be amended to specify ancillary services as a reference service, under pipeline services. The Authority requires clause 4.1 to be amended by including the words "Reference Services, being the Ancillary Services", as set out in Required Amendment 1 below.

Required Amendment 1.

Clause 4.1 should be amended as follows:

4.1 Pipeline Services

ATCO Gas Australia offers the following Pipeline Services by means of the AGA GDS to Prospective Users:

a) Reference Services, being the Haulage Services; and

b) ~~Non-Reference Services.~~ Reference Services, being the Ancillary Services; and

c) Non-Reference Services.

Total Revenue

Revenue Building Blocks

Regulatory Requirements

83. Rule 76 of the NGR provides that total revenue is to be determined for each regulatory year of the access arrangement period using a building block approach:

> 76. Total revenue
>
> Total revenue is to be determined for each regulatory year of the access arrangement period using the building block approach in which the building blocks are:
>
> a) a return on the projected capital base for the year; and
>
> b) depreciation on the projected capital base for the year; and

[27] ATCO Gas Australia, *Access Arrangement for the Mid-West and South-West Gas Distribution System*, 17 March 2014, section 4, p. 9.

c) the estimated cost of corporate income tax for the year; and

d) increments of decrements for the year resulting from the operation of incentive mechanism to encourage gains in efficiency; and

e) a forecast of operating expenditure for the year.

84. ATCO has applied the building block methodology, including an estimate of the tax liability, to determine the total revenue for the fourth access arrangement period.

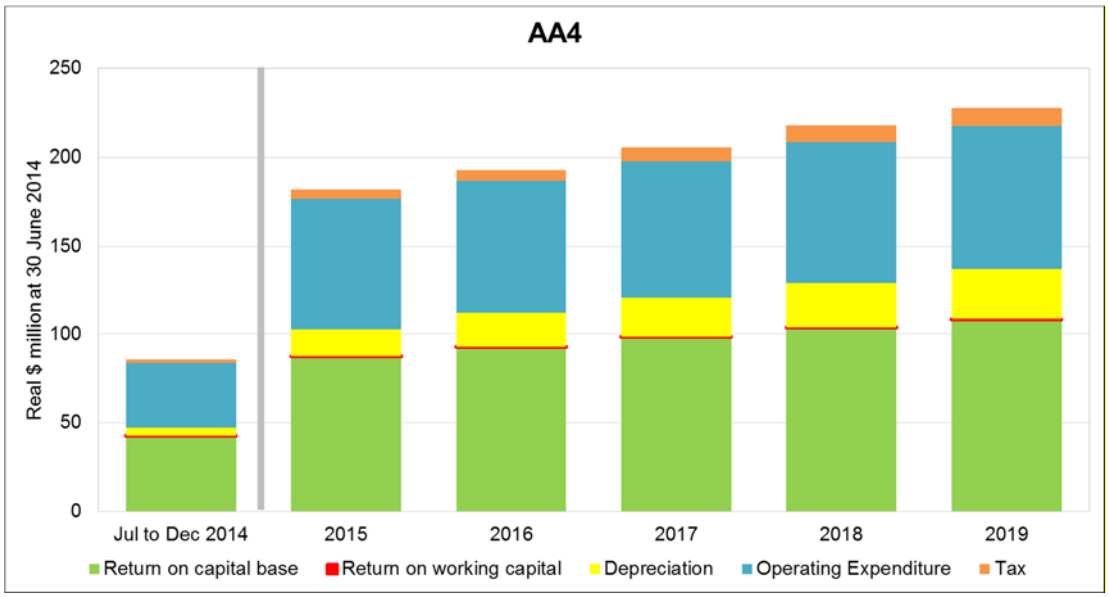
ATCO's Proposed Changes

85. ATCO's proposed revised access arrangement has a total revenue requirement for the fourth access arrangement period of $1,111.08 million[28]. ATCO has calculated total revenue in accordance with the building block approach, as the sum of the following:

- forecast operating expenditure;
- return on the projected capital base;
- depreciation of the projected capital base;
- estimated cost of corporate income tax (net of imputation credits); and
- estimated return on working capital.

86. ATCO's proposed total revenue for each year of the fourth access arrangement period is shown by building block in Figure 1.

Figure 1 ATCO Proposed Total Revenue Building Blocks (AA4)



Source: ATCO Gas Australia, Tariff Model, September 2014.

87. A breakdown of ATCO's proposed total revenue for each year of the fourth access arrangement period in nominal dollars is set out in Table 3.

[28] Real $ million at 30 June 2014. ATCO Gas Australia, *Tariff Model*, September 2014.

Table 3 ATCO's Proposed Total Revenue (Nominal) Building Blocks (AA4)

Nominal $ Million	July to Dec 2014	2015	2016	2017	2018	2019	Total
Forecast Operating Expenditure	36.88	77.03	79.83	83.60	87.98	91.89	457.21
Return on Projected Capital Base	42.96	90.55	98.48	106.96	115.50	123.91	578.36
Depreciation of Projected Capital Base	4.83	15.52	20.45	24.86	28.91	32.74	127.33
Estimated Cost of Corporate Income Tax	2.64	7.44	8.26	11.11	14.16	15.53	59.13
Imputation Credits	(0.66)	(1.86)	(2.07)	(2.78)	(3.54)	(3.88)	(14.78)
Estimated Return on Working Capital	0.10	0.20	0.19	0.22	0.26	0.30	1.26
ATCO's Proposed Total Revenue (Nominal) Building Blocks	**86.74**	**188.88**	**205.15**	**223.97**	**243.27**	**260.49**	**1,208.50**

Source: ATCO Gas Australia, Tariff Model, September 2014.

88. ATCO has not included revenues from non-reference services in total revenue. The terms and conditions of non-reference services are negotiated outside the access arrangement.

Submissions

89. None of the submissions made to the Authority address the calculation of total revenue. Public submissions in relation to the total revenue building blocks are discussed under the appropriate Draft Decision chapters below.

Considerations of the Authority

90. The Authority's assessment of ATCO's proposed total revenue is documented in the following Draft Decision chapters:

- Operating Expenditure;
- Opening Capital Base;
- Projected Capital Base;
- Rate of Return;
- Gamma;
- Depreciation;
- Taxation; and
- Return on Working Capital.

91. As a result of the Authority's assessment of ATCO's proposed total revenue building blocks as per rule 76 of the NGR set out in detail below, the Authority does not approve ATCO's proposed total revenue for the fourth access arrangement period. The Authority's approved total revenue by building block in nominal dollars is set out in Table 4.

Table 4 Authority Approved Total Revenue (Nominal) Building Blocks (AA4)

Nominal $ Million	Jun to Dec 2014	2015	2016	2017	2018	2019	Total
Forecast Operating Expenditure	32.26	64.46	66.16	67.77	70.48	72.43	373.56
Return on Projected Capital Base	29.52	61.36	64.76	67.14	69.17	71.07	363.02
Depreciation of Projected Capital Base	15.06	36.23	39.98	43.22	46.80	50.58	231.87
Estimated Cost of Corporate Income Tax	8.13	-	-	-	-	-	8.13
Imputation Credits	(4.07)	-	-	-	-	-	(4.07)
Estimated Return on Working Capital	0.14	0.10	0.14	0.16	0.17	0.19	0.90
Inflationary Gain							
Return on Projected Capital Base	(11.23)	(23.14)	(24.42)	(25.31)	(26.08)	(26.79)	(136.96)
Return on Working Capital	(0.05)	(0.04)	(0.06)	(0.06)	(0.07)	(0.07)	(0.35)
Authority Approved Total Revenue (Nominal) Building Blocks	**69.76**	**138.98**	**146.56**	**152.92**	**160.47**	**167.40**	**836.10**

Source: ERA, GDS Tariff Model, October 2014.

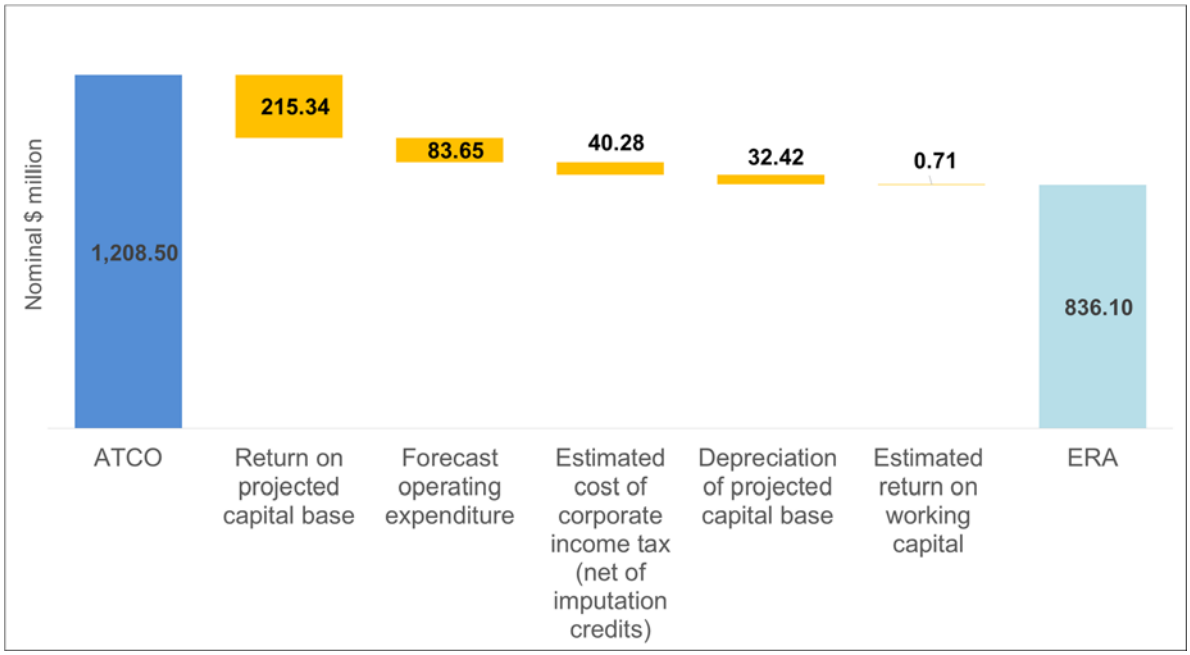
92. As shown in Table 4, the Authority has separately identified the removal of an amount relating to an inflationary gain in calculating the return on capital and working capital using a nominal rate of return and a nominal value of the capital base/working capital requirement. In essence, the values for return on capital and return on working capital are inflated twice (rather than only once) by multiplying an inflated capital base/working capital requirement by a rate of return which is inflated.

93. ATCO proposed to remove this inflationary gain from its depreciation allowance as shown in Table 39. ATCO has proposed to adopt a depreciation schedule that transitions over a number of access arrangements. ATCO's transition approach applies straight-line depreciation to the CCA value of the opening capital base for existing assets before 1 July 2014 and removes an amount relating to the inflationary gain. ATCO then applies straight-line depreciation to the HCA value of forecast capital expenditure.

94. The Authority does not consider that the inflationary gain should be offset from the nominal depreciation as explained in paragraphs 521 to 532. The Authority considers that the inflationary gain relates to the return on assets rather than nominal depreciation. The Authority treats the inflationary gain as a separate item in the revenue building block rather than offsetting depreciation or the return on asset.

95. Figure 2 compares ATCO's proposed revenue building blocks with the Authority approved building blocks.

Figure 2 Comparison of ATCO's Proposed and Authority Approved Revenue Building Blocks[29]



Source: ERA, GDS Tariff Model, October 2014.

Required Amendment 2.

The Authority requires that ATCO amend the proposed revised access arrangement values for total revenue (nominal) to reflect the values in Table 4.

[29] For comparison purposes, depreciation and working capital include the inflationary gain.

Demand Forecast

Regulatory Requirements

96. Rule 72 of the NGR contains requirements for the provision of information in an access arrangement in relation to demand.

> 72. Specific requirements for access arrangement information relevant to price and revenue regulation
>
> (1) The access arrangement information for a full access arrangement proposal (other than an access arrangement variation proposal) must include the following:
>
> (a) if the access arrangement period commences at the end of an earlier access arrangement period:
>
> ...
>
> (iii) usage of the pipeline over the earlier access arrangement period showing:
>
> (A) for a distribution pipeline, minimum, maximum and average demand…
>
> (B) for a distribution pipeline, customer numbers in total and by tariff class …
>
> …
>
> (d) to the extent it is practicable to forecast pipeline capacity and utilisation of pipeline capacity over the access arrangement period, a forecast of pipeline capacity and utilisation of pipeline capacity over that period and the basis on which the forecast has been derived; …

97. In addition, rule 74 contains specific requirements for the provision of forecasts and estimates.

> 74. Forecasts and estimates
>
> (1) Information in the nature of a forecast or estimate must be supported by a statement of the basis of the forecast or estimate.
>
> (2) A forecast or estimate:
>
> (a) must be arrived at on a reasonable basis; and
>
> (b) must represent the best forecast or estimate possible in the circumstances.

ATCO's Proposed Changes

98. ATCO has developed a demand forecast for the fourth access arrangement period that is based on the forecast number of connections by tariff class (A1, A2, B1, B2, B3) and the expected corresponding consumption. ATCO has based its demand forecast on historical data, and has obtained advice from external consultants.[30]

99. ATCO has modified its demand forecast methodology by:

- Using Effective Degree Day (**EDD**) weather normalisation rather than Heating Degree Day (**HDD**) weather normalisation, in order to minimise demand forecast bias from extreme one-off weather events.[31]

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[30] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 42.

[31] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 47 – 49.

- Adopting a long-term price elasticity factor, which is based on the identification and validation of long-term sensitivity factors.[32]

100. ATCO expects the minimum, average and maximum demand to increase over the forthcoming access arrangement period.

101. ATCO has forecast that the number of GDS customers and consumption per customer will both grow at a rate of 2.1 per cent over the forthcoming access arrangement period. ATCO's demand forecast includes ATCO's expected additional customer numbers and consumption as a result of ATCO's proposed business development and marketing campaign.[33]

102. ATCO's forecast customer numbers by tariff class over the fourth access arrangement period are shown in Table 5.

Table 5 ATCO Forecast Customer Numbers (AA4)

Tariff Class	2014	2015	2016	2017	2018	2019
A1	70	70	70	70	70	69
A2	112	120	126	132	138	145
B1	1,410	1,468	1,528	1,589	1,652	1,717
B2	9,932	10,346	10,792	11,270	11,781	12,326
B3	664,763	679,549	694,284	708,948	723,542	738,065

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 9, p. 57.

103. ATCO's forecast customer usage (GJ) by tariff class over the fourth access arrangement period is shown in Table 6. Based on Table 6, ATCO has forecast a decline in the annual average growth in usage for B2 customers from 2014 to 2016 and an annual increase from 2016 to 2019.

Table 6 ATCO Forecast Customer Usage (AA4, GJ)

Tariff Class	2014	2015	2016	2017	2018	2019
A1	11,922,065	12,029,555	12,143,688	12,370,908	12,673,841	13,008,602
A2	2,103,786	2,208,644	2,315,018	2,445,268	2,593,941	2,752,930
B1	1,652,379	1,667,284	1,691,685	1,729,881	1,775,516	1,823,895
B2	1,194,484	1,177,612	1,169,788	1,173,334	1,183,114	1,195,512
B3	9,970,563	10,089,375	10,274,990	10,501,759	10,747,244	10,999,195

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 9, p. 57.

104. As shown in Table 7, ATCO has forecast an increase in customers across all tariff classes by 7,239 over the fourth access arrangement period as a result of its proposed business development and marketing campaign. ATCO's proposed business development and marketing expenditure is explained in more detail in the Operating Expenditure chapter of this Draft Decision in paragraphs 253 to 272.

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32 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 49 – 50.

33 ATCO's proposed business development and marketing campaign is discussed in detail in the Operating Expenditure chapter of this Draft Decision.

Table 7 ATCO Forecast New Connections and Usage from Business Development and Marketing Operating Expenditure (AA4)

Tariff Class	July to Dec 2014	2015	2016	2017	2018	2019
Customer number	781	1,439	1,287	1,244	1,244	1,244
Customer usage (TJ)	50.0	114.2	144.1	175.9	208.3	240.7

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 16, p. 84.

Submissions

105. The Authority has not received submissions in relation to ATCO's demand forecast in the GDS access arrangement revision proposal.

Considerations of the Authority

106. According to ATCO, actual demand was lower than forecast demand during both the second and third access arrangement periods.[34]

107. Actual average customer usage, that is, the average amount of gas consumed by customers, was six per cent lower than forecast in the third access arrangement period.[35] Usage by both A1 (industrial) and B3 (residential) customers in the third access arrangement period was lower than forecast, and this was the main cause of the overall shortfall.[36] ATCO has attributed lower A1 usage primarily to the shutdown of two industrial plants. ATCO has attributed lower average B3 usage to warmer weather, retail gas price increases, subsidised electricity prices, advent of solar photovoltaic cells and improved appliance efficiency levels.

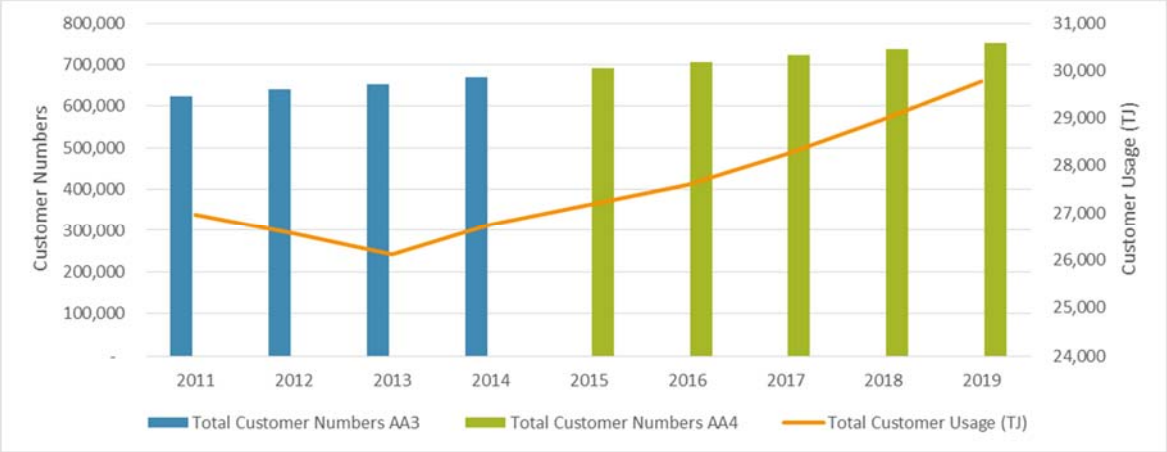
108. Figure 3 shows the trend in actual and forecast customer numbers and usage over the third and fourth access arrangement periods.

[34] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 43, 45.

[35] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 43.

[36] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 44.

Figure 3 ATCO Actual and Forecast Customer Numbers and Usage (AA3 and AA4)



Source: ATCO Gas Australia, Tariff Model, September 2014.

109. The Authority has requested that its technical advisor, Energy Market Consulting associates (**EMCa**), investigate the key drivers behind ATCO's demand forecast for the fourth access arrangement period. EMCa has undertaken a high level assessment of the demand impact of its technical review of ATCO's proposed revised access arrangement.

110. EMCa has noted that, out of ATCO's customer base of 676,287 customers in 2014:

- 664,763 (98.3 per cent) are B3 customers, and they account for 37 per cent of total usage;
- 70 (0.01 per cent) are A1 customers, and they account for 44 per cent of total usage; and
- 11,454 (1.69 per cent) are A2, B1 and B2 customers, and they account for 19 per cent of total usage.

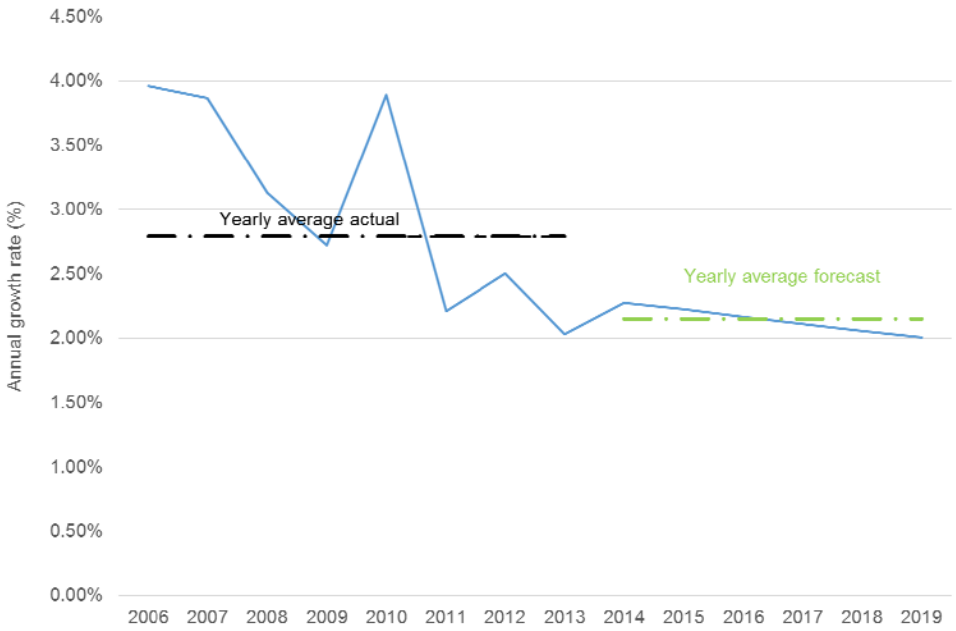
111. ATCO has forecast a 2.1 per cent growth in B3 customers per year over the fourth access arrangement period:[37]

- ATCO's forecast growth rate in B3 customers for the fourth access arrangement period is less than the average growth rate over the third access arrangement period (2.3 per cent).
- ATCO's forecast growth rate in B3 customers for the fourth access arrangement period is less than the B3 customer growth rate from 2006 to 2013 (2.8 per cent).

112. Figure 4 shows both the actual annual growth in B3 customers from 2006 and ATCO's projected annual growth in B3 customers over the fourth access arrangement period.

[37] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 4, p. 50.

Figure 4 ATCO Proposed Annual Growth in B3 Customers

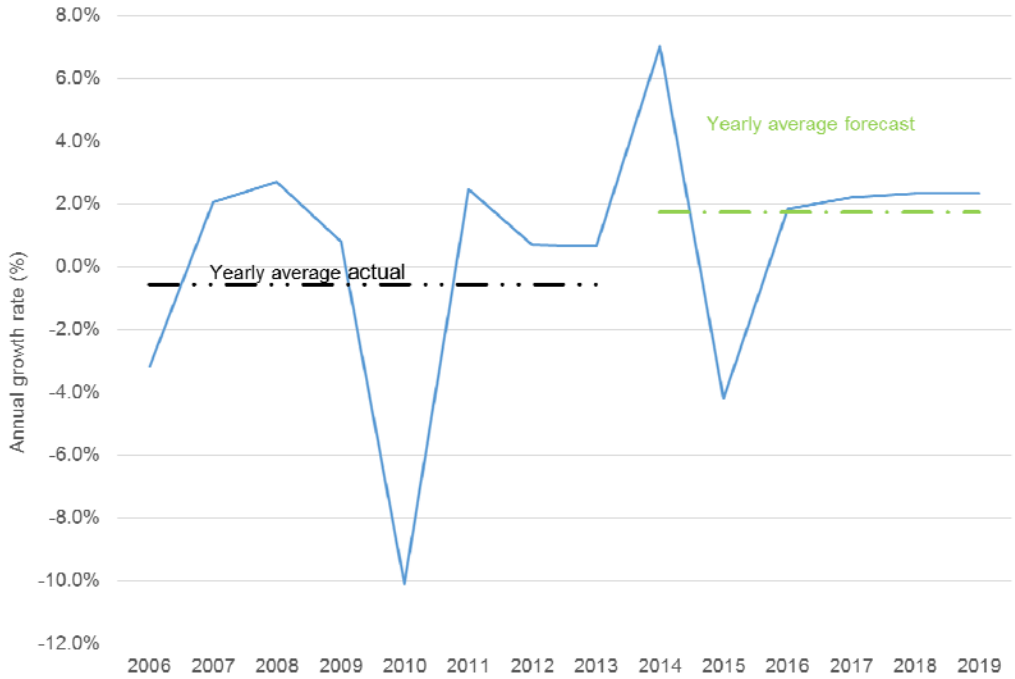


Source: EMCa, Review of Technical Aspects of the Proposed Access Arrangement, ATCO Gas Australia Proposed Access Arrangement for the Mid-West and South-West Gas Distribution Systems, June 2014. ATCO Gas Australia, Tariff Model, September 2014.

113. ATCO has forecast a 2 per cent growth in B3 average customer usage per year over the fourth access arrangement period. Actual growth rate in B3 average customer usage from 2006-2013 was -0.57 per cent.

114. Figure 5 shows both the actual annual growth in B3 average customer usage from 2006 and ATCO's projected annual growth in B3 average customer usage over the fourth access arrangement period. The Authority notes that the dip in 2010 and the spike in 2014 can be partially explained by partial year data due to the migration from calendar year to fiscal year data in 2010, and back to calendar year data in 2014.

Figure 5 ATCO Proposed Annual Growth in B3 Customer Usage



Source: EMCa, Review of Technical Aspects of the Proposed Access Arrangement, ATCO Gas Australia Proposed Access Arrangement for the Mid-West and South-West Gas Distribution Systems, June 2014. ATCO Gas Australia, Tariff Model, September 2014.

115. ATCO has developed a demand forecast for A1, A2, B1 and B2 tariff classes for the fourth access arrangement period as follows:

- ATCO has developed customer number forecasts in-house.
- Core Energy Group Pty Ltd (**Core**) has then produced usage forecasts based on estimated usage growth.

116. ATCO has developed the demand forecast for the B3 tariff class as follows:

- ATCO has relied on B3 connection growth forecasts from Economics Consulting Services (**ECS**), and has then excluded the Albany and Kalgoorlie connections to arrive at a forecast for new B3 connections to the regulated network of 17,490 in 2014, 17,740 in 2015 and 17,760 thereafter.
- ATCO has then provided Core with these connection forecasts, in addition to the following:
  - ATCO's own forecast of additional new customers and additional usage that it expects from its proposed business development and marketing campaign.
  - ATCO's own forecast of 250 new B3 customers over the fourth access arrangement period occurring in 2014 as a result of the introduction of a new meter (AL10).
- Core has produced aggregate customer number forecasts using these inputs, and deducting its forecast number of disconnections.
- To produce its volume forecasts, Core developed volume forecasts per connection, by tariff type, using regression analysis taking account of factors such as normalised weather in effective degree-days (EDD), trending and price elasticity. Core then modified the regression-based forecast for qualitative factors which included (for

example) ATCO's assessment of the impact on volumes of its proposed business development and marketing campaign.

117. EMCa has noted the following concerns in relation to the development of ATCO's B3 demand forecast:

- The ECS report[38] describes a number of factors that could be considered to affect new B3 connections, including population growth, land activity and housing activity. After discussing these factors, ECS describes the B3 demand forecast for the fourth access arrangement period as being predominantly based on long term population growth.
- The ECS report has assumed the highest considered population growth rate at less than two per cent as the basis of forecast new customers. The report provides three population growth assumptions, the highest of which commences at 2 per cent and declines to 1.8 per cent per year over the period from 2015 to 2019. The central population growth assumption is 0 to 0.2 per cent per year lower, and the lowest population growth assumption is around 0 to 0.2 per cent per year lower again.
- The demand forecast assumes that annual customer disconnections represent close to 20 per cent of the assumed number of new customer connections. This may indicate an overly pessimistic customer forecast.
- The Core report projects a levelling of the decline in average usage per customer that has been evident for the past seven years. The report assumes that average annual usage per customer will stabilise at around 14.8 GJ. This assumption is based on a qualitative adjustment that Core has made to the per-customer volume forecasts resulting from its regression model. EMCa notes that it is difficult to reconcile Core's assumption that the usage decline has now stabilised, with the evidence of continuing decline each year in the average annual volumes for newly connected B3 customers.[39] EMCa has noted that the annual usage of the most recently connected customers is less than 12 GJ.

118. The Authority has addressed ATCO's proposed demand forecast in the Operating Expenditure and Projected Capital Base chapters of this Draft Decision. The Authority has adjusted ATCO's proposed demand forecast in line with these chapters as follows:

- The Authority considers that ATCO's proposed business development and marketing campaign will not have the impact on customer usage that ATCO foresees. In the Operating Expenditure chapter of this Draft Decision (refer to paragraphs 253 to 272), the Authority has decided to baseline ATCO's business development and marketing expenditure at the current level. This is because ATCO's proposed business development and marketing campaign yields a negative net present value when ATCO's key assumptions, including customer usage assumptions, are adjusted. The Authority considers that the adjusted business development and marketing operating expenditure would still deliver ATCO's proposed marginal increase in the number of customers.
- The Authority considers that ATCO's proposed customer initiated greenfield growth capital expenditure is not conforming capital expenditure. In the Projected Capital Base chapter of this Draft Decision (refer to paragraphs 469 to 471), the Authority considers that ATCO has not provided any evidence that the large and relatively

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38 Economics Consulting Services, *ATCO Gas Australia Connections Forecast*, May 2013.

39 Energy Market Consulting associates, Review of Technical Aspects of the Proposed Access Arrangement, ATCO Gas Australia Proposed Access Arrangement for the Mid-West and South-West Gas Distribution Systems, June 2014, para 241, p. 60.

generic expansion initiative of greenfield customer initiated capital expenditure satisfies the incremental revenue test under rule 79(2)(b) of the NGR. The Authority has thus adjusted the customers that ATCO has included in its demand forecast as a result of customer initiated greenfield projects.

119. The Authority has adjusted ATCO's demand forecast to reflect the following:

- Reduction in ATCO's forecast number of B3 customers to reflect the Authority's decision to exclude ATCO's proposed customer initiated greenfield growth capital expenditure from conforming capital expenditure.
- Average annual usage per customer for new B2 customers of 80GJ, and average annual usage per customer for new B3 customers of 12 GJ, as per recent usage data for new customers.[40]
- Average usage per customer for existing B2 and B3 customers will be constant as of 2014.

120. The Authority has decided that:

- Even with the Authority's adjustment to business development and marketing operating expenditure, the Authority's adjusted demand forecast includes ATCO's forecast customer number increases that it attributed to its proposed business development and marketing campaign. The Authority considers that the portion of the expenditure that it has deemed as efficient would deliver the forecast customer number growth.
- Customer numbers and usage for A1, A2 and B1 customers will be as per ATCO's demand forecast.

121. The Authority's adjusted GDS demand forecast for the fourth access arrangement period is shown in Table 8.

[40] ATCO Gas Australia, Email response to EMCa56, 17 April 2014.

Table 8 Authority Adjusted GDS Demand Forecast (AA4)[41]

Tariff class	2014 July to Dec	2015	2016	2017	2018	2019
A1						
Customers	70	70	70	70	70	69
Usage (GJ)	6,038,463	12,029,555	12,143,688	12,370,908	12,673,841	13,008,602
A2						
Customers	112	120	126	132	138	145
Usage (GJ)	1,093,677	2,208,644	2,315,018	2,445,268	2,593,941	2,752,930
B1						
Customers	1,410	1,468	1,528	1,589	1,652	1,717
Usage (GJ)	901,816	1,667,284	1,691,685	1,729,881	1,775,516	1,823,895
B2						
Customers	9,932	10,346	10,792	11,270	11,781	12,326
Usage (GJ)	638,656	1,227,604	1,263,284	1,301,524	1,342,404	1,386,004
B3						
Customers	664,763	666,936	675,346	677,378	679,340	681,231
Usage (GJ)	5,643,642	9,996,639	10,097,553	10,121,937	10,145,481	10,168,173
Total						
Customers	676,287	678,940	687,862	690,439	692,981	695,488
Usage (GJ)	14,316,253	27,129,726	27,511,228	27,969,518	28,531,183	29,139,604

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 9, p. 57. ATCO Gas Australia, Email response to EMCa56, 17 April 2014. ERA, GDS Tariff Model, October 2014.

Required Amendment 3.

The Authority requires that ATCO update the GDS demand forecast for the fourth access arrangement period in accordance with Table 8.

Key Performance Indicators

Regulatory Requirements

122. Rule 72 of the NGR states that the access arrangement information must include key performance indicators that support the service provider's expenditure proposal in the access arrangement period.

[41] This demand forecast includes customers receiving prudent discounts.

72. Specific requirements for access arrangement information relevant to price and revenue regulation

(1) The access arrangement information for a full access arrangement proposal (other than an access arrangement variation proposal) must include the following:

…

(f) the key performance indicators to be used by the service provider to support expenditure to be incurred over the *access arrangement period*;

…

ATCO's Proposed Changes

123. ATCO has provided eight Key Performance Indicators (**KPIs**) under three categories, with targets and the rationale for each target. Table 9 shows the eight KPIs and targets.

Table 9 ATCO KPIs and Targets (AA4)

Key Performance Indicator	ATCO Proposed Target
Customer Service	
Domestic customer connections with timeframes	>97 per cent
Attendance to broken mains and services within one hour	>97 per cent
Attendance to loss of gas supply within three hours	>97 per cent
Network integrity	
Total public reported gas leaks per one kilometre main	<0.8
System Average Interruption Frequency Index (SAIFI)	<0.005
Unaccounted for Gas (UAFG)	<2.9 per cent
Expenditure	
Operating expenditure per kilometre of main	$ 6,068
Operating expenditure per customer connection	$ 116

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 2, p. 30.

124. Of the above eight KPI targets, only the following three exclude the unregulated GDS component that covers Albany and Kalgoorlie:

- Unaccounted for Gas (UAFG).
- Operating expenditure per kilometre of main.
- Operating expenditure per customer connection.

Submissions

125. The Authority has not received submissions in relation to ATCO's key performance indicators in the GDS access arrangement revision proposal.

Considerations of the Authority

126. The Authority requested that its technical advisor, Energy Market Consulting associates (**EMCa**), assess ATCO's KPIs from the following perspectives:

- The reason for the inclusion of the KPI – with reference to the requirement of rule 72 of the NGR, ATCO's reporting obligations under the Gas Distribution License (GDL8, Version 8), the provisions in AS4645.1 2008, and the performance targets of other Australian gas distribution businesses.
- The rationale for the target – with reference to past performance, the proposed expenditure in AA4, and other Australian gas distribution businesses.

127. EMCa has found that with the exception of UAFG expenditure, ATCO has not provided information that indicates that it has modelled the impact of its proposed expenditure on the KPIs it proposes. The Authority finds that the absence of such modelling limits the value of the KPIs in supporting ATCO's expenditure proposal over the fourth access arrangement period, and thus the appropriateness of the KPIs under rule 72 of the NGR.

128. EMCa has assessed ATCO's proposed KPI targets, and has proposed targets that it considers to be more reasonable than those proposed by ATCO, based on the following:

- Derived proxy for customers' expectations for the six customer service and network integrity KPIs, by considering ATCO's past performance and available benchmark information from other Australian gas distribution utilities.
- Link between ATCO's proposed KPIs, KPI targets and expenditure over the fourth access arrangement period.
- Likelihood of attainment of the targets, based on information that ATCO has provided in its proposed revised access arrangement, and in response to subsequent information requests from EMCa.

129. EMCa has given more weight to more recent performance, as it considers that it is more representative of the results of previous investment given the generally observed lag between investment and improved performance. EMCa has therefore considered average service performance over the most recent three-year period (as provided by ATCO).

130. Based on the issues raised in ATCO's proposed revised access arrangement and Asset Management Plan (**AMP**) and consistent with the declared business objectives of ATCO, EMCa has also suggested that ATCO include an asset health performance measure within its key performance indicators for the fourth access arrangement period.

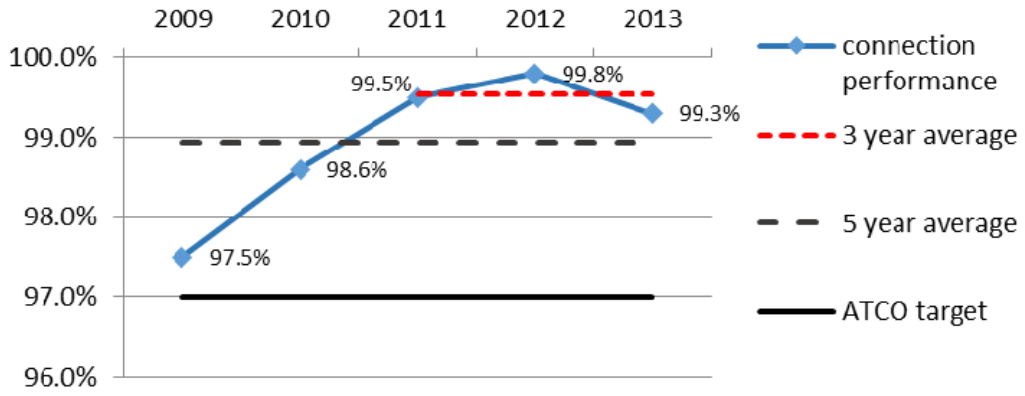
Domestic customer service connections within timeframes

131. ATCO has described *domestic customer service connections within timeframes* as "the percentage of new customer connections to established domestic dwellings on the distribution network provided within any applicable regulated time limit" (within five days). ATCO has proposed this KPI because it aims to increase the number of customers. ATCO has set a target for this KPI to help ensure that it maintains connection times within customers' expected timeframes despite the forecast increase in connections.

132. Figure 6 shows ATCO's five year performance and fourth access arrangement period target for *domestic customer service connections within timeframes*. ATCO's proposed target for domestic customer service connections within five days is 97 per cent over the fourth access arrangement period. ATCO's three-year average

performance was 99.5 per cent, and ATCO's five-year average performance was 98.9 per cent.

Figure 6 ATCO's Performance – Domestic Customer Service Connections within Timeframes (per cent)



Source: EMCa, Review of Technical Aspects of the Proposed Access Arrangement, ATCO Gas Australia Proposed Access Arrangement for the Mid-West and South-West Gas Distribution Systems, June 2014. ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 7.

133. ATCO has forecast 2.1 per cent annual growth in B3 customers over the fourth access arrangement period, which is less than both the average growth rate over the third access arrangement period (2.26 per cent) and the B3 customer growth rate from 2006 to 2013 (2.8 per cent). The Authority has revised downwards ATCO's annual growth in B3 customers over the fourth access arrangement period. Similarly, the forecast net connection growth in other tariff classes is not sufficiently high (or compelling) to lead to significant extra pressure on ATCO's connection performance. Moreover, ATCO has proposed significant increases in operating and capital expenditure to manage additional pressure on the network. Also, the Authority's revised expenditure for the fourth access arrangement period is above the levels of the current access arrangement. Therefore, the Authority considers that ATCO's connection performance should not deteriorate materially.

134. ATCO's AMP designates a target for this KPI of greater than 98 per cent over the fourth access arrangement period. The Authority has also reviewed ATCO's proposed KPI in light of other gas distribution networks in Australia. The Authority notes that ActewAGL targets 100 per cent for this KPI for 2010-2015.

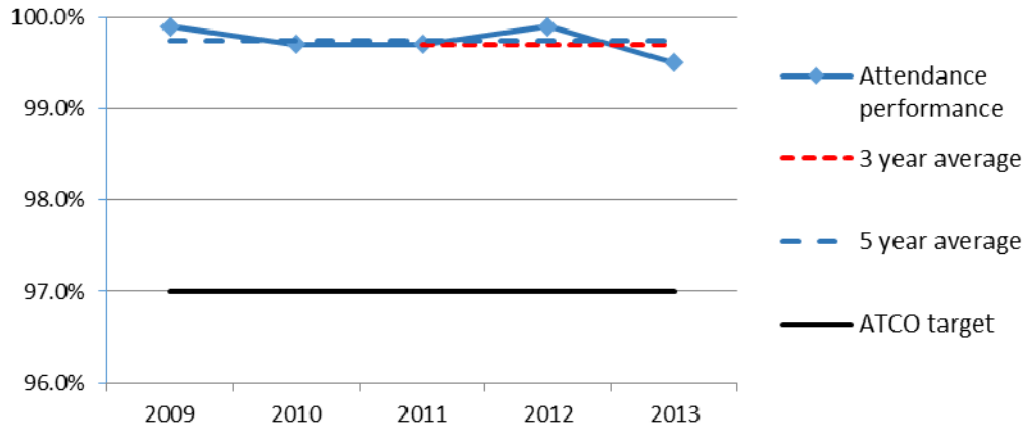
135. The Authority considers that it is appropriate for ATCO to include *domestic customer service connections within timeframes* in its revised access arrangement for the fourth access arrangement period under rule 72 of the NGR. The Authority also considers that ATCO should be able to achieve a rate of domestic customer service connections within five days at or above 99.5 per cent over the fourth access arrangement period, as per ATCO's three-year average performance.

Attendance to broken mains and services within one hour

136. ATCO has described *attendance to broken mains and services within one hour* as the percentage of attendance to broken mains and services within one hour of the service request being received. ATCO has noted that this indicator is included in the Safety Case. ATCO has proposed this KPI as it is a key safety indicator. The Authority notes that this is a recommended KPI in AS4645.

137. Figure 7 shows ATCO's five year performance and fourth access arrangement period target for *attendance to broken mains and services within one hour*. ATCO's proposed target for this KPI is 97 per cent over the fourth access arrangement period. ATCO's three-year average performance and five-year average performance were 99.7 per cent.

Figure 7 ATCO's Performance – Attendance to Broken Mains and Services within One Hour (per cent)



Source: EMCa, Review of Technical Aspects of the Proposed Access Arrangement, ATCO Gas Australia Proposed Access Arrangement for the Mid-West and South-West Gas Distribution Systems, June 2014. ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 8.

138. ATCO has proposed capital expenditure on new and upgraded depots (near growth areas), on IT systems, and on new and upgraded vehicles, all of which ATCO itself argues will lead to better field service performance. ATCO's fourth access arrangement period target of 97 per cent for this KPI does not support ATCO's increased operating and capital expenditure requirements. ATCO would likely achieve attendance within one hour 97 per cent of the time on average without any additional expenditure over the third access arrangement period levels.

139. The Authority notes that ActewAGL is the only other gas distribution network in Australia which has the same KPI and it targets 100 per cent for 2010-2015.

140. The Authority considers that it is appropriate for ATCO to include *attendance to broken mains and services within one hour* in its revised access arrangement for the fourth access arrangement period under rule 72 of the NGR. The Authority also considers that ATCO should be able to achieve a rate of attendance to broken mains and services within one hour at or above 99.7 per cent over the fourth access arrangement period, as per ATCO's three-year and five-year average performance.

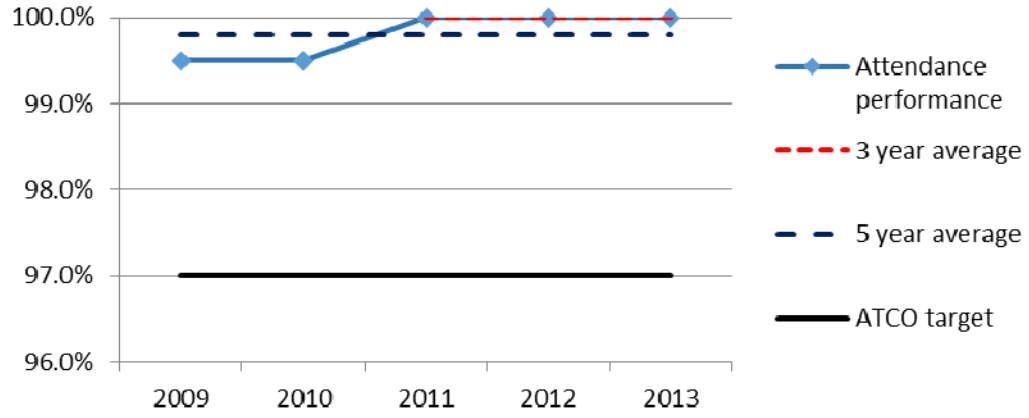
Attendance to loss of gas supply within three hours

141. ATCO has described *attendance to loss of gas supply within three hours* as the percentage of attendance to loss of gas supply within three hours of the service request being received. ATCO has noted that this indicator is included in the Safety Case. ATCO has proposed this KPI as it is a key safety indicator.

142. Figure 8 shows ATCO's five year performance and fourth access arrangement period target for *attendance to loss of gas supply within three hours*. ATCO's proposed target for this KPI is 97 per cent over the fourth access arrangement period. ATCO's three-year average performance and five-year average performance were 99.7 per cent.

ATCO's AMP designates a target of greater than 98 per cent over the fourth access arrangement period.

Figure 8 ATCO's Performance – Attendance to Loss of Gas Supply within Three Hours (per cent)



Source: EMCa, Review of Technical Aspects of the Proposed Access Arrangement, ATCO Gas Australia Proposed Access Arrangement for the Mid-West and South-West Gas Distribution Systems, June 2014. ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 8.

143. ATCO has proposed capital expenditure on new and upgraded depots (near growth areas), in IT systems, and in new and upgraded vehicles, all of which ATCO itself argues will lead to better field service performance. Moreover, ATCO has proposed sustaining capital expenditure of $133.6 million to improve network security and reduce the risk of loss of supply. ATCO's fourth access arrangement period target of 97 per cent for this KPI does not support ATCO's increased operating and capital expenditure requirements. ATCO would likely comfortably achieve attendance within three hours 97 per cent of the time on average without any additional expenditure over the third access arrangement period levels.

144. The Authority considers that it is appropriate for ATCO to include *attendance to loss of gas supply within three hours* in its revised access arrangement for the fourth access arrangement period under rule 72 of the NGR. The Authority also considers that ATCO should be able to achieve a rate of attendance to loss of gas supply within three hours at or above 99.7 per cent over the fourth access arrangement period, as per ATCO's three-year and five-year average performance.

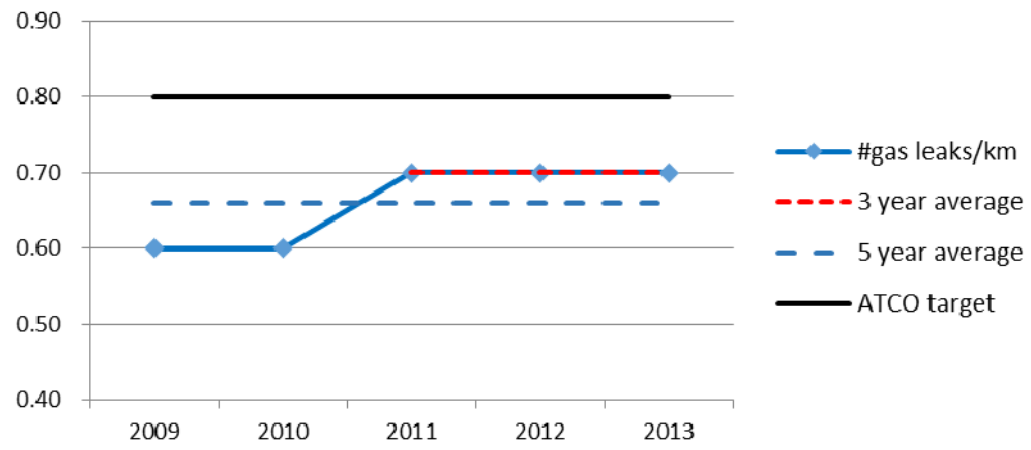
Total public reported gas leaks per one kilometre main

145. ATCO has described *total public reported gas leaks per one kilometre main* as the total number of confirmed gas leaks reported by the public (excluding third party damage) per kilometre of main. ATCO has chosen this KPI as it is more likely to reflect the performance of the network and ATCO's investment in performance improvement than the number of leaks reported by ATCO. ATCO links its target to its proposed increased expenditure on preventative maintenance, asserting that it should reduce the number of publically reported leaks. The Authority notes that this is a recommended KPI in AS4645.

146. Figure 9 shows ATCO's five year performance and fourth access arrangement period target for *total public reported gas leaks per one kilometre main*. ATCO's proposed target for this KPI is 0.8 reported leaks per one kilometre main over the fourth access

arrangement period. ATCO's three-year average performance was 0.7, and ATCO's five-year average performance was 0.66.

Figure 9 ATCO's Performance – Total Public Reported Gas Leaks per One Kilometre Main



Source: EMCa, Review of Technical Aspects of the Proposed Access Arrangement, ATCO Gas Australia Proposed Access Arrangement for the Mid-West and South-West Gas Distribution Systems, June 2014. ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 9.

147. ATCO's preventative maintenance plan in its proposed revised access arrangement is designed to offset the impact of a steadily ageing (deteriorating) mains asset base. ATCO has proposed increased expenditure on volumetric activities such as leak surveys and cathodic protection. Furthermore, ATCO's Medium and High pressure mains strategy is based on replacing end-of-life mains, prioritising the mains showing the highest leakage rates. This is a long term project, but it should enable ATCO to at least help sustain if not reduce the leakage rate.

148. The Authority notes that ActewAGL is another Australian gas distribution company that uses the same KPI, and has set a target for 2010-2015 for this KPI at 0.3.

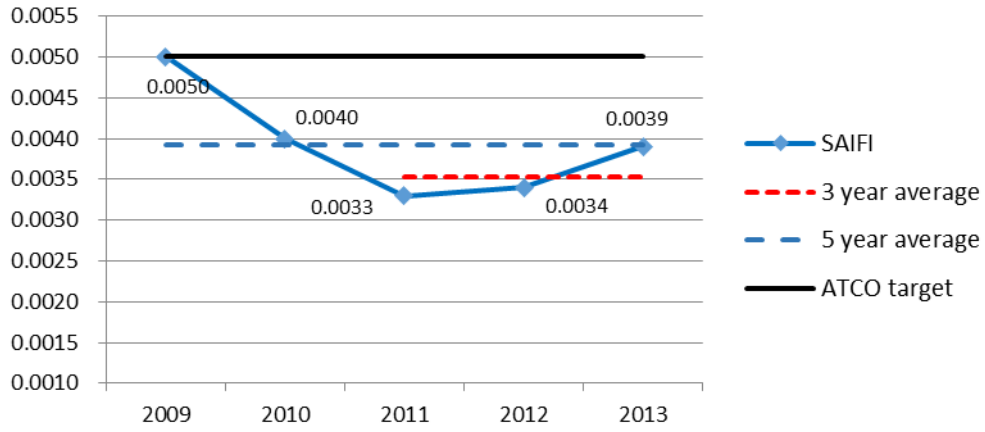
149. The Authority considers that it is appropriate for ATCO to include *total public reported gas leaks per one kilometre main* in its revised access arrangement for the fourth access arrangement period under rule 72 of the NGR. The Authority also considers that ATCO should be able to achieve total public reported gas leaks per one kilometre main at or below 0.7 over the fourth access arrangement period, as per ATCO's three-year average performance.

System Average Interruption Frequency Index (SAIFI)

150. ATCO has described *SAIFI* as the number of supply interruptions experienced by the average customer as a result of sustained interruptions, calculated as (Σ number of customers interrupted)/(number of customers served). As stated by ATCO in its proposed revised access arrangement, SAIFI is an accepted and common measure of the reliability and security of gas supply. The Authority also notes that SAIFI is a recommended KPI in AS4645.

151. Figure 10 shows ATCO's five year performance and fourth access arrangement period target for SAIFI. ATCO's proposed target for this KPI is less than 0.005 over the fourth access arrangement period. ATCO's three-year average performance was 0.0035, and ATCO's five-year average performance was 0.0039.

Figure 10 ATCO's Performance – SAIFI



Source: Energy Market Consulting associates, Review of Technical Aspects of the Proposed Access Arrangement, ATCO Gas Australia Proposed Access Arrangement for the Mid-West and South-West Gas Distribution Systems, June 2014. ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 10.

152. ATCO's AMP and proposed revised access arrangement are based on investing to improve SAIFI (among other things). The revised access arrangement includes increased expenditure that should maintain or improve network condition and performance. This expenditure is linked to the installation of high pressure pipelines, interconnections and associated pressure reduction infrastructure to provide supply security for customers.

153. The Authority considers that it is appropriate for ATCO to include *SAIFI* in its revised access arrangement for the fourth access arrangement period under rule 72 of the NGR. The Authority also considers that ATCO should be able to achieve sustained SAIFI performance at or above 0.0035, based on performance over the past three years, over the fourth access arrangement period.

Unaccounted for Gas (UAFG)

154. A detailed analysis of this KPI and target are included in the Operating Expenditure section of this Draft Decision (refer to paragraphs 305 to 309).

155. The Authority considers that it is appropriate for ATCO to include an efficient amount of UAFG in its forecast operating expenditure for the revised access arrangement for the fourth access arrangement period under rule 72 of the NGR. The Authority also considers that ATCO should be able to achieve UAFG performance as per Table 15 of this Draft Decision.

Operating expenditure per kilometre of main and per customer connection

156. ATCO defines *operating expenditure per kilometre of main* as the total operating expenditure per year per total kilometre of main. ATCO defines *operating expenditure per customer connection* as the total operating expenditure per year divided by the total number of customer connections.

157. ATCO's proposed target for *operating expenditure per kilometre of main* for the fourth access arrangement period is $6,068. ATCO's proposed target for *operating expenditure per customer connection* for the fourth access arrangement period is $116. ATCO states in its proposed revised access arrangement that operating

expenditure is expected to increase over the fourth access arrangement period as a result of Safety Case requirements and network growth.

158. ATCO's proposed revised access arrangement refers to two benchmarking studies in relation to these two KPIs, with up to eight comparable Australian gas network businesses. The presented benchmarking information indicates that ATCO's *operating expenditure per kilometre of main* and *operating expenditure per customer connection* is the lowest of the distribution businesses in the sample. The Authority notes that the study covers the years 2005 to 2013, and thus that the ATCO benchmark corresponds to the second and third access arrangement periods rather than the fourth.

159. ATCO's consultant has pointed out that while relatively low unit costs can indicate that a firm is cost efficient, there can be other factors that explain costs differences between firms.[42] Such factors include the following:

- Relative quality of service.
- Historical or legacy features of the business, such as the relative age of the network and historical levels of maintenance and renewals expenditure.
- Features of the environment in which the firms operate, including customer and energy density and business regulations.

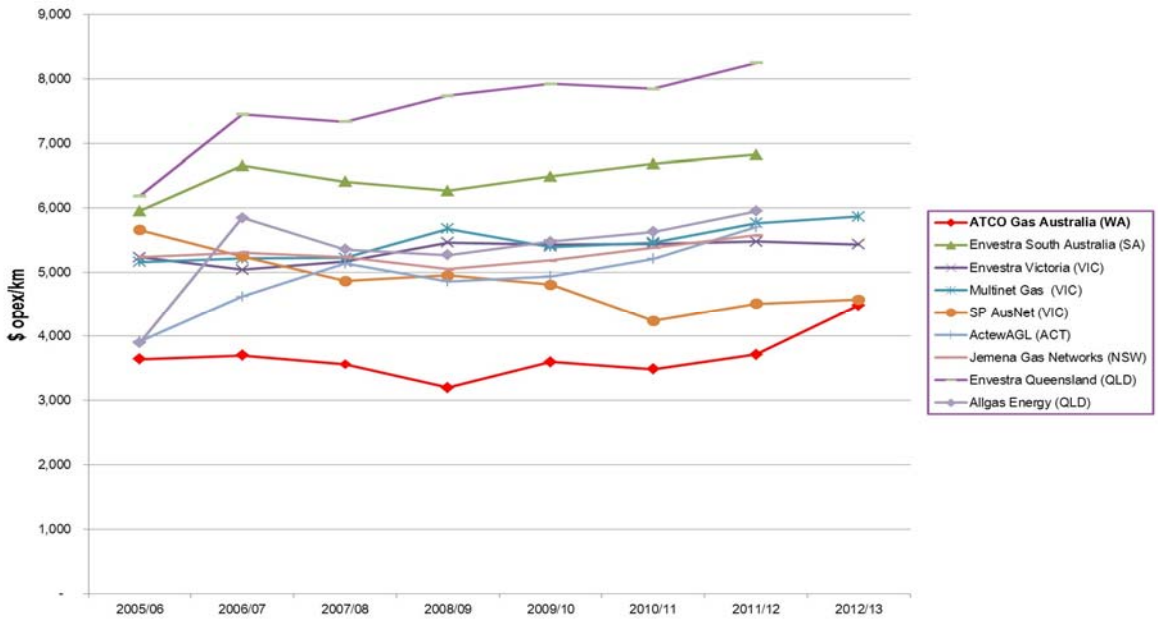
160. Figure 11 shows the *operating expenditure per kilometre of main* for ATCO and selected gas distribution benchmarks over the period from 2005 to 2013.

161. The Authority has recalculated the target for *operating expenditure per kilometre of main* to $4,774, which is consistent with the majority of gas businesses in Figure 11. The Authority's recalculation is based on the following:

- Operating expenditure reduction as per this Draft Decision.
- Reduction in new kilometres of mains, pro-rated to the reduction in growth capital expenditure as per this Draft Decision.

[42] Acil Allen Consulting, *Gas Distribution Benchmarking, Report to ATCO Gas*, 11 March 2014.

Figure 11 Operating Expenditure per Kilometre of Main – Benchmarking Study



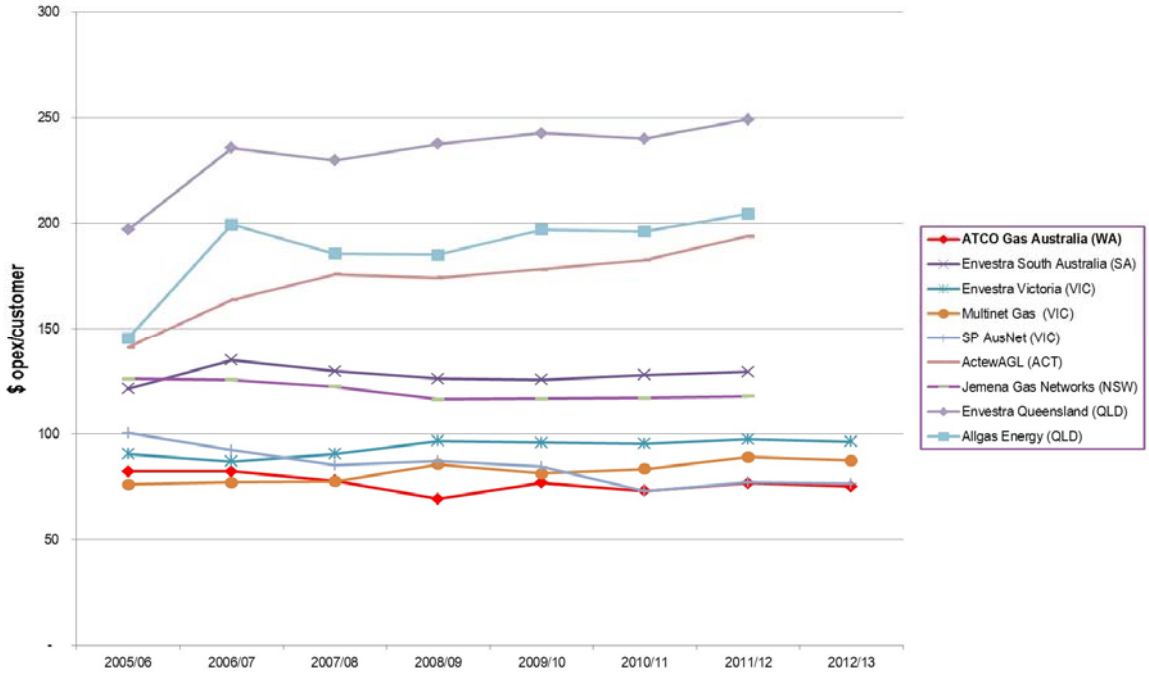
Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 28.

162. Figure 12 shows the *operating expenditure per customer connection* for ATCO and selected gas distribution benchmarks over the period from 2005 to 2013.[43] The Authority has recalculated the target for *operating expenditure per customer connection* to $92, which is consistent with the most efficient gas businesses in Figure 12. The Authority's recalculation is based on the following:

- Operating expenditure reduction as per this Draft Decision.
- Demand forecast adjustment as per this Draft Decision.

43 Authority's technical advisor EMCa has noted that the data for ATCO in this figure does not match the information provided by ATCO in Figure 13 of the Access Arrangement Information.

Figure 12 Operating Expenditure per Customer Connection – Benchmarking Study



Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 29.

163. The Authority considers that it is appropriate for ATCO to include *operating expenditure per kilometre of main* and *operating expenditure per customer connection* in its revised access arrangement for the fourth access arrangement period under rule 72 of the NGR. The Authority requires an adjusted target for both KPIs based on the required amendments to ATCO's proposed Operating Expenditure, Opening Capital Base, Projected Capital Base and Demand Forecast chapters of this Draft Decision. The Authority approves a target for *operating expenditure per kilometre of main* of $4,774, and for *operating expenditure per customer connection* of $92.

Additional indicators

164. The Authority's technical advisor, EMCa, has assessed ATCO's proposed KPIs and has also recommended that ATCO develop an asset health KPI for the fourth access arrangement period in response to this Draft Decision, along with complementary models to support the necessary links between expenditure and service outcomes.

165. The Authority considers that ATCO should include an asset health KPI to provide a link between network management and the service level that is experienced by customers. The Authority considers that an asset health KPI is important, given the increase in forecast sustaining capital expenditure over the fourth access arrangement period. The asset health KPI would need to:

- Address how changes to asset condition data and models occurring during the access arrangement period will be accounted for; and
- Provide flexibility to make efficient adjustments within the access arrangement period, for example and efficient capital expenditure/operating expenditure trade-off allowing for deferral of an asset replacement.

166. The Authority therefore requires that ATCO develop an asset health KPI, and propose a target for it for the fourth access arrangement period.

167. Table 10 shows ATCO's proposed KPIs and targets for the fourth access arrangement period and the Authority's approved KPI targets.

Table 10 Authority Approved ATCO KPIs (AA4)

Key Performance Indicator	ATCO Proposed Target	Authority Approved Target
Customer Service		
Domestic customer connections with five days	>97 per cent	>99.5 per cent
Attendance to broken mains and services within one hour	>97 per cent	>99.7 per cent
Attendance to loss of gas supply within three hours	>97 per cent	>99.7 per cent
Network Integrity		
Total public reported gas leaks per one kilometre main	<0.8	<0.7
System Average Interruption Frequency Index (SAIFI)	<0.005	<0.0035
Unaccounted for Gas (UAFG)	<2.9 per cent	2.57per cent
Expenditure		
Operating expenditure per kilometre of main	$ 6,068	$4,774
Operating expenditure per customer connection	$116	$92

Required Amendment 4.

The Authority requires that ATCO amend KPI targets as per Table 10 of this Draft Decision.

The Authority also requires that ATCO develop an asset health KPI, and propose a target for it for the fourth access arrangement period.

Operating Expenditure

Regulatory Requirements

168. Rule 91 of the NGR sets the criteria the Authority must consider in approving a service provider's operating expenditure:

> 91. Criteria governing operating expenditure
>
> 1) Operating expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of delivering pipeline services.
>
> 2) The [Authority's] discretion under this rule is limited.

169. Rule 74 of the NGR contains specific requirements for the provision of forecasts and estimates.

> 74. Forecasts and estimates
>
> 1) Information in the nature of a forecast or estimate must be supported by a statement of the basis of the forecast or estimate.
>
> 2) A forecast or estimate:
>
> a) must be arrived at on a reasonable basis; and
>
> b) must represent the best forecast or estimate possible in the circumstances.

170. Rule 71 of the NGR is also relevant to the Authority's consideration of forecast operating expenditure.

> 71. Assessment of compliance
>
> 1) In determining whether capital or operating expenditure is efficient and complies with other criteria prescribed by these rules, the [Authority] may, without embarking on a detailed investigation, infer compliance from the operation of an incentive mechanism or on any other basis the [Authority] considers appropriate.
>
> 2) The [Authority] must, however, consider, and give appropriate weight to, submissions and comments received when the question whether a relevant access arrangement proposal should be approved is submitted for public consultation.

ATCO's Proposed Changes

171. ATCO has forecast an increase in operating expenditure to total $421.14 million[44] for the fourth access arrangement period[45] (a five and a half year period). ATCO's operating expenditure forecast in its initial proposed revised access arrangement for the fourth access arrangement period was $453.80 million. ATCO's updated forecast of $421.14 million incorporates revised UAFG costs and an amended IT service

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44 ATCO Gas Australia, *Tariff Model,* September 2014. All values are in real $ million at 30 June 2014.

45 Fourth access arrangement period refers to the five and a half years from July 2014 to December 2019.

agreement.[46] Total actual operating expenditure for the third access arrangement period[47] is estimated at $284.48 million[48] (a four and a half year period).

172. ATCO has identified the key drivers for the increase in forecast operating expenditure as GDS Safety Case requirements and network growth.[49] The GDS Safety Case has been developed in consultation with Energy*Safety* under the *Gas Supply and System Safety Standard Regulations 2000.* ATCO has noted that the Safety Case will be revised and re-submitted to Energy*Safety* this year. ATCO has proposed a business development and marketing campaign that underpins network growth assumptions.

173. ATCO has split operating expenditure for the proposed revised access arrangement into five main categories: Network, Corporate, Unaccounted for Gas (**UAFG**), Information Technology (**IT**) and Ancillary Services.[50]

174. Of the total ATCO forecast operating expenditure for the fourth access arrangement period:

- network operating expenditure accounts for 43 per cent ($182.80 million);
- corporate operating expenditure accounts for 31 per cent ($132.16 million), out of which $24.61 million is attributed to business development and marketing expenditure;
- IT operating expenditure accounts for 14 per cent ($58.70 million);
- UAFG operating expenditure accounts for 10 per cent ($43.70 million); and
- ancillary service operating expenditure[51] accounts for one per cent ($3.78 million).

175. Figure 13 shows the Authority's approved operating expenditure forecast for the third access arrangement period, ATCO's actual operating expenditure in the third access arrangement period, in addition to ATCO's proposed operating expenditure forecast for the fourth access arrangement period.

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46 ATCO Gas Australia, *Letter to ERA*, 30 July 2014.
ATCO Gas Australia, *Letter to ERA*, 29 August 2014.

47 Third access arrangement period refers to the four and a half years from January 2010 to June 2014.

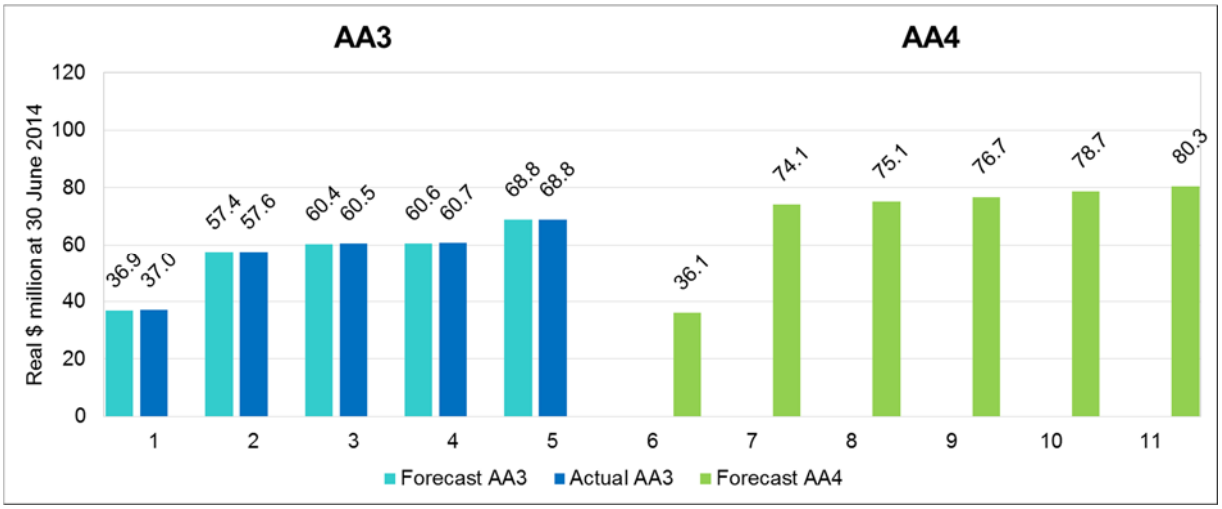
48 ATCO Gas Australia, *Tariff Model*, September 2014. All values are in real $ million at 30 June 2014.

49 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 59-117.

50 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 59.

51 Ancillary service operating expenditure covers operating expenditure on ancillary services, which are deregistering a delivery point, applying a meter lock, removing a meter lock, disconnecting a delivery point, and reconnecting a delivery point.

Figure 13 Authority's Approved Forecast and Actual Operating Expenditure (AA3) and ATCO's Proposed Operating Expenditure (AA4) by Year



Source: ERA, GDS Tariff Model, October 2014.

176. ATCO has forecast an increase in network operating expenditure from $125.47 million for the third access arrangement period to $182.80 million[52] for the fourth access arrangement period.[53] ATCO's forecast operating expenditure for the fourth access arrangement period can be broken down as follows: [54]

- 27.6 per cent per cent on variable volume network maintenance, which includes the costs of planned and unplanned maintenance to operate, inspect and maintain the network;
- 24.48 per cent on network operations support, which includes the cost of asset management, engineering and technical compliance functions;
- 22.73 per cent on network maintenance, which includes the costs of management, supervision and unallocated costs associated with a range of network functions;
- 16.83 per cent on network control, which includes the costs of operating the control room, call centre and market service function;
- 5.96 per cent on network maintenance projects, which includes the costs of specific maintenance projects like in-line inspections and vegetation management; and
- 2.4 per cent on network construction, which includes the costs of management, supervision and unallocated costs associated with maintenance projects and other field maintenance activities.

177. ATCO has forecast baseline recurring network operating expenditure to account for 85.50 per cent ($156.30 million) of network operating expenditure, while incremental recurring network operating expenditure is expected to account for 13.51 per cent

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52 ATCO's forecast network operating expenditure has been updated. ATCO Gas Australia, *Email response to ERA20*, 4 July 2014.

53 The third access arrangement period was 4.5 years, and the fourth access arrangement period is 5.5 years.

54 Due to an inconsistency between the total forecast network operating expenditure derived by aggregating expenditure by project and expenditure by type, we have used percentages here when discussing expenditure by project.

($24.70 million) and one-off network operating expenditure accounts for 0.98 per cent ($1.80 million).

178. ATCO has forecast an increase in corporate operating expenditure from $70.40 million for the third access arrangement period to $132.16 million for the fourth access arrangement period:

- $91.48 million on corporate support operating expenditure, which includes internal support costs (finance and tax, human resources and corporate affairs, legal and regulatory, IT cost centre) and intercompany support charges;[55]
- $24.61 million on business development and marketing operating expenditure;[56] and
- $16.07 million[57] on license fees to Energy*Safety*, Economic Regulation Authority, Energy Industry Ombudsman, Retail Energy Market Company, Department of Mines and Petroleum, Office of the Gas Disputes Arbitrator, and Department of Regional Development and Lands.

179. Within the human resources and corporate affairs component of internal support costs, ATCO has factored in an annual average increase in labour costs of two per cent above the Consumer Price Index (**CPI**). This labour cost escalation factor is based on ATCO's qualitative assessment of modifications to the Communications, Electrical and Plumbing Union Enterprise Agreement, the Western Australian Wage Price Index forecasts and changes to superannuation legislation. ATCO also foresees additional operating expenditure increases during the fourth access arrangement period that it has not accounted for in its proposed labour cost escalation factor. These increases would result from reforms to the Privacy Act, Fair Work Act, industrial relation legislation, and Work Health and Safety legislation.

180. ATCO has also forecast an increase in corporate support operating expenditure as a result of forecasting an increase in intercompany support charges. ATCO has proposed to apply the Massachusetts Method as defined by the American Gas Association to allocate intercompany support charges to ATCO Gas Australia.

181. ATCO has forecast a total spending of $24.61 million in the fourth access arrangement period on business development and marketing in an effort to grow the number of GDS customers in response to an observed decline in average consumption per customer. ATCO's proposed business development and marketing initiatives in the proposed revised access arrangement cover the following areas:

- development and execution initiatives to grow connection and throughput;
- commercial management;
- business case development and evaluation; and

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55 ATCO has corrected its proposed corporate support operating expenditure after submitting the access arrangement:

ATCO Gas Australia, *Email response to EMCa19*, 24 April 2014.

56 ATCO has corrected its proposed business development and marketing operating expenditure after submitting the access arrangement:

ATCO Gas Australia, *Email response to EMCa79*, 8 May 2014.

57 On 26 August 2014, ATCO revised proposed license fees to $14.34 million in an email response to the Authority.

- Stakeholder relationship development and management with retailers, builders, commercial, residential land developers and customers.

182. ATCO has forecast an increase in IT operating expenditure from $35.29 million for the third access arrangement to $58.70 million for the fourth access arrangement. ATCO initially proposed $67.11 million of IT operating expenditure for the fourth access arrangement period, but has adjusted its proposal to $58.70 million in light of updated IT arrangements.

183. ATCO has attributed the forecast increase in IT operating expenditure to the Safety Case requirements and investment in the billing system. ATCO updated the IT component of the proposed revised access arrangement to account for an updated IT service arrangement with a new provider, Wipro Ltd (**WIPRO**) that replaces the IT service arrangement with ATCO I-Tek Australia (**I-Tek**). Forecast IT operating expenditure covers the following:

- IT licence fee, which covers all vendor provided software that is used by ATCO;
- IT service fee, which covers IT support for telephony, telecoms, desktop support, etc.; and
- IT usage fee, which covers the shared IT hardware and software infrastructure on which all ATCO IT systems reside and operate.[58]

184. ATCO has forecast an overall reduction in the rate of UAFG from 2.67 per cent in 2014 to 2.60 per cent in 2019. ATCO has forecast an increase in UAFG operating expenditure to $43.70 million for the fourth access arrangement period based on the following assumptions:

- ATCO has updated the average gas price based on the conclusion of a competitive tender for the supply of UAFG gas.[59]
- ATCO has assumed that the UAFG rate will increase in July-December 2014 and then decrease gradually to 2.60 per cent.
- ATCO has assumed that total GDS throughput will increase over the fourth access arrangement period.

185. Table 11 shows ATCO's proposed operating expenditure forecast for the fourth access arrangement period.

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58 IT usage fee has been eliminated in the Wipro IT service agreement, from 2015 onwards.

59 ATCO Gas Australia, *Letter to ERA*, 30 July 2014.

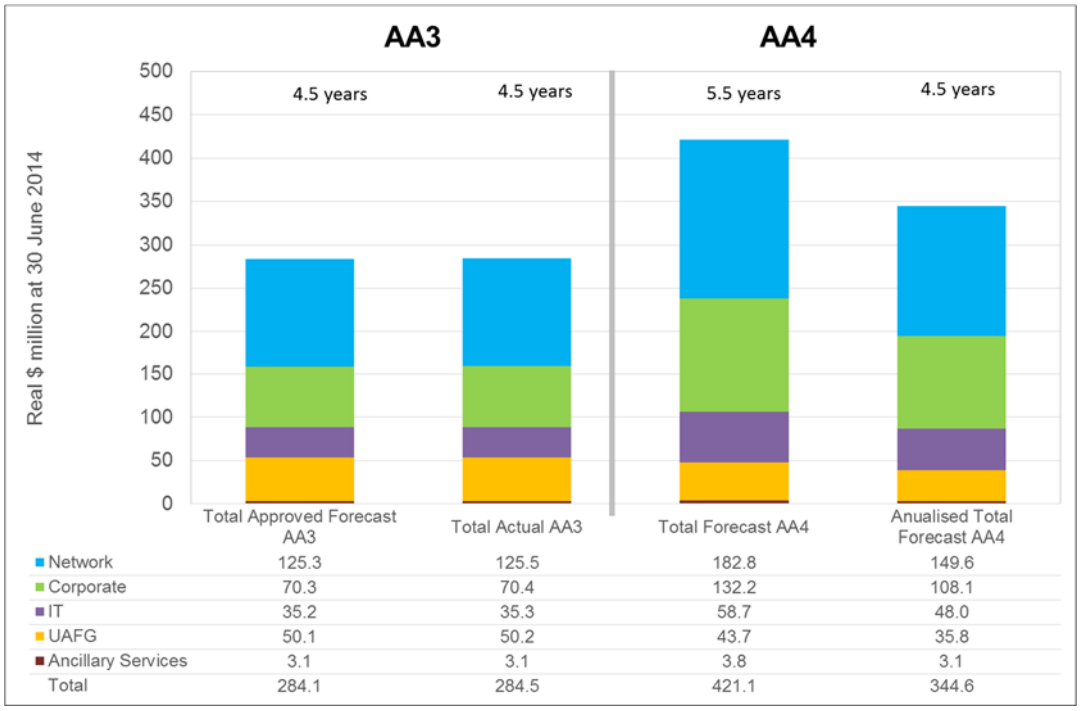
Table 11 ATCO's Proposed Operating Expenditure Forecast by Category (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Network Operating Expenditure	15.00	31.30	33.00	33.60	34.50	35.40	182.80
Corporate Operating Expenditure	11.52	23.90	22.80	23.64	24.83	25.47	132.16
IT Operating Expenditure	4.90	10.70	10.90	10.90	10.70	10.60	58.70
UAFG Operating Expenditure	4.40	7.60	7.70	7.90	8.00	8.10	43.70
Ancillary Service Operating Expenditure	0.32	0.63	0.68	0.70	0.72	0.74	3.78
ATCO Proposed – Operating Expenditure	**36.14**	**74.13**	**75.07**	**76.73**	**78.75**	**80.31**	**421.14**

Source: ATCO Gas Australia, Tariff Model, September 2014.

186. Figure 14 shows the Authority's total approved operating expenditure forecast for the third access arrangement period (four and a half years) and ATCO's actual operating expenditure for the period, in addition to ATCO's total proposed revised forecast for the fourth access arrangement period (five and a half years) and ATCO's proposed revised forecast pro-rated to a four and a half year period for comparison.

Figure 14 Authority's Approved Forecast and Actual Operating Expenditure (AA3) and ATCO's Proposed Operating Expenditure (AA4) by Category



Source: ERA, GDS Tariff Model, October 2014.

Submissions

187. Alinta Energy (**Alinta**) has submitted that ATCO's advertising campaign is high cost. The campaign includes television commercials, outdoor ad shelters and press.[60] At the same time, Alinta has noted that ATCO's proposed marketing and business development activities for the fourth access arrangement period support very small increases in new connections (on average 1,316 per year) at a cost of approximately $3,000 per new connection.[61]

188. Both Alinta and Wesfarmers Kleenheat Gas (**Kleenheat**) have questioned the value of ATCO's marketing activities outside incentives for new customer connections and a general promotion of the "gas is good" message.[62] Alinta mentions that it has received calls from confused customers querying ATCO's role in the natural gas market. Alinta counteracts ATCO's statement in its Access Arrangement Information that "there has been very little activity in relation to marketing the benefits and use of natural gas in Perth"[63] by citing its ongoing "Save with Gas" campaign and the Capricorn Estate

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60 Alinta Energy, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014.

61 Alinta Energy, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014.

62 Alinta Energy, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014.

Kleenheat Gas, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014.

63 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 78.

project (undertaken in partnership with ATCO) as examples of other natural gas marketing campaigns.

189. Alinta has also noted ATCO's initially submitted forecast spend on UAFG for the fourth access arrangement period, which is 15 per cent higher than for the third access arrangement period.[64] Alinta has pointed out that ATCO has recently gone out to tender for providers of UAFG for the fourth access arrangement period. Alinta expects the wholesale gas price offered under the tender process to be lower than that under the third access arrangement period tender process. Alinta thus considers that forecast expenditure on UAFG should be adjusted to reflect the outcome of ATCO's tender process.

Considerations of the Authority

190. The Authority has sought to verify ATCO's operating expenditure during the third access arrangement period, in order to review ATCO's proposed forecast operating expenditure for the fourth access arrangement period.

Verification of Operating Expenditure

191. In order for the Authority to review ATCO's access arrangement proposal, the Authority requested that ATCO provide financial information in relation to its proposed revised access arrangement proposal.

192. On 16 July 2014, ATCO provided the Authority with copies of the statutory accounts for the year ending 30 June 2011, the six months ending 31 December 2011, and the years ending 31 December 2012 and 31 December 2013.

193. On 7 August 2014, ATCO provided the Authority with regulatory financial accounts for the year ending 30 June 2011, the six months ending 31 December 2011, and the years ending 31 December 2012 and 31 December 2013.

194. On 8 August 2014, ATCO provided the Authority with its Cost Allocation Method 2014 (**CAM**) document, which explains the methods that ATCO uses for the following:

- classifying expenditure as relating to regulated or unregulated networks;
- classifying expenditure as relating to reference or non-reference services;
- reclassifying capital contributions on a deferred revenue basis to a cash basis;
- reclassifying accounting revenue treated as capital contributions according to regulatory definitions;
- excluded capital expenditure, which is recovered via user specific charges.

195. ATCO engaged PricewaterhouseCoopers (**PWC**) to conduct a non-statutory review of the financial information relating to the schedule of regulatory revenue, operating expenditure and capital expenditure for the regulatory financial accounts provided to the Authority.

196. PWC stated for all regulatory accounts that based on its review, which was not an audit, nothing came to its attention that caused it to believe that the regulatory accounts

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64 Alinta Energy, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014.

are not prepared, in all material respects, in accordance with the accounting policies described in the CAM.

197. The Authority has undertaken its own review, analysing the statutory accounts and ATCO's associated adjustments to obtain the regulatory accounts. These adjustments have been reviewed to ensure that they are in accordance with the methodology set out in the CAM.

198. In conducting this review, the Authority has made several requests to ATCO for further breakdowns of costs and a more detailed explanation of how the CAM is applied in practice. These requests centred on being able to better understand direct and indirect costs, and how costs were allocated to non-regulated network areas such as Albany and Kalgoorlie.

199. Regarding operating expenditure, ATCO has stated in the CAM that a proportion of indirect costs that is not able to be directly attributed to services that relate to the Albany and Kalgoorlie networks, is calculated by dividing the number of delivery points in the Albany and Kalgoorlie networks by total delivery points in the network. This percentage is then multiplied by total indirect costs, and the resulting cost portion is excluded from the regulatory accounts.

200. The Authority has noted that for the regulatory accounts for the third access arrangement period, ATCO has in fact calculated this percentage based on the haulage revenue for the Albany and Kalgoorlie networks as a proportion of total revenue.

201. ATCO has confirmed that for the third access arrangement period, the indirect costs percentage for the Albany and Kalgoorlie networks was calculated using revenue. ATCO has stated that, from the beginning of 2014, ATCO calculates the indirect costs percentage for the Albany and Kalgoorlie networks using delivery points.

202. The Authority notes that the difference between the percentages for the two calculation methods is minimal, and, in this case, not material. However, the Authority is concerned that the regulatory accounts have been prepared inconsistently with the methodology outlined in the CAM.

203. The Authority accepts that the regulatory accounts provided by ATCO are free from material misstatement and apart from the calculation method mentioned above, prepared in accordance with the CAM for operating expenditure.

Assessment of Operating Expenditure

204. ATCO's proposed revised operating expenditure forecast for the fourth access arrangement period is equivalent to an average annual operating expenditure forecast of $76.57 million. ATCO's proposed average annual operating expenditure forecast for the fourth access arrangement period is 21 per cent higher than the average annual operating expenditure that has been incurred by ATCO during the third access arrangement period.

205. The Authority's technical advisor, EMCa, has assessed ATCO's governance framework and processes in relation to operating expenditure forecasting. EMCa's review has focused on ATCO's policies, processes, procedures and reference documents that relate to project and program development, approval and delivery. EMCa conducted the review in relation to ATCO's corporate objectives and regulatory obligations, in addition to good industry practice.

206. EMCa's main concerns in relation to ATCO's governance of operating expenditure forecasting are as follows:

- ATCO has not justified the Safety Case thresholds that it has applied.
- ATCO has developed its forecasts using a bottom-up approach by incremental aggregation of detailed activity forecasts that have largely been determined by subjective assessments for which the assumptions cannot be independently verified. EMCa considers that the forecasts have not been subject to sufficient top-down challenge, which has lead ATCO to over-estimate operating expenditure forecasts.

207. Assessment of ATCO's proposed forecast operating expenditure for the fourth access arrangement period has covered the following:

- Labour escalation factor;
- Network operating expenditure;
- Corporate operating expenditure;
- IT operating expenditure;
- UAFG operating expenditure; and
- Ancillary service operating expenditure.

Labour Escalation Factor

208. ATCO has factored into its forecast operating expenditure for the fourth access arrangement period a proposed labour cost escalation factor of two per cent above CPI for each year of the fourth access arrangement period from 2015 onwards.

209. ATCO has justified its proposed labour cost escalation factor on a qualitative assessment that is based on its experience, processes and market intelligence, and takes into account the following:

- ATCO and CEPU Enterprise Agreement (**EA**): EA 2013 that expires on 31 December 2015, and expectations in regard to the EA 2016;
- Market trends: expected salary increases for salaried employees based on observed market practice, salary survey evidence from the Hay Group, Mercer and Ausrem, and the WA Wage Price Index (**WPI**) forecast; and
- Superannuation guarantee rate: legislated increases in the superannuation guarantee rate.

210. The Authority has engaged EMCa to assess ATCO's proposed labour cost escalation to determine whether it is reasonable and represents the best forecast or estimate possible in the circumstances, taking into account the following:

- the industry in which ATCO operates;
- Western Australian context in which ATCO operates;
- recent AER determinations, and
- ATCO's obligations regarding superannuation increases.

211. The Authority notes that EMCa has provided the following evidence regarding ATCO's proposed real labour cost escalation factor:

- The most recent regulatory determination (AER, January 2014) in the Electricity, Gas, Water and Waste Sector (**EGWWS**) approved labour cost escalation above two per cent per year in real terms.[65]

212. The Authority considers that ATCO's proposed labour cost escalation factor should not be higher than 1.75 per cent as per the following evidence:

- Western Australia's Treasury's forward estimates for the Western Australian WPI for 2014-2015 to 2017-2018 is 0.50 to 1.25 per cent higher than CPI[66]; and
- over the four years from 2009-2013, the EGWWS has experienced a WPI of 0.50 per cent (on average) above the all-industry Western Australian WPI.

213. Moreover, in relation to ATCO's justification of the proposed labour cost escalation factor, the Authority notes the following:

- based on the Authority's review, ATCO's proposed two per cent labour cost escalation factor could be the highest expected labour cost increase rather than a prudent average over the five years from 2015 to 2019;
- ATCO has not demonstrated how it has used the evidence that it provided to derive its estimate of its proposed real labour cost escalation factor;
- the evidence[67] that ATCO provided to the Authority to justify its proposed labour cost escalation rate does not explicitly detail the considerations that ATCO refers to in its proposed revised access arrangement, nor does ATCO's proposed two per cent directly link to the evidence provided; and
- in relation to the superannuation guarantee rate:
  - superannuation guarantee rate increased by 0.25 per cent as of 1 July 2014[68], rather than ATCO's discussed 0.5 per cent;
  - the Australian Government has decided to freeze the superannuation guarantee rate; and
  - the Authority has not received assurance from ATCO that ATCO has applied its proposed superannuation guarantee rate increase to the salaries of employees that receive superannuation payments only, rather than to total labour costs that include bonuses and other non-salary items.

214. The Authority has thus decided to reject ATCO's proposed labour escalation factor on the basis that the justification provided does not satisfy rule 74 of the NGR. In particular, the Authority is not satisfied that there is a reasonable basis to support ATCO's proposed labour escalation factor (in accordance with rule 74(1) of the NGR), nor that ATCO's proposed labour cost escalation factor is the best forecast in the circumstances (in accordance with rule 74(2)(b) of the NGR). As a result, the Authority has only applied CPI escalation to expenditure.

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65 Australian Energy Regulator, Final Decision, SP Ausnet Transmission Determination 2014-15 to 2016-17, January 2014, Table A.1

66 Government of Western Australia, Department of Treasury, *Budget Economic Forecasts*, http://www.treasury.wa.gov.au/cms/TwoColumns_Content.aspx?pageid=13730&id=604

67 ATCO Gas Australia, *Email response to ERA19(b) and attachments*, 4 July 2014.

68 Australian Taxation Office, https://www.ato.gov.au/Business/Employers-super/How-much-to-pay-and-when-to-pay/

Network Operating Expenditure

215. ATCO has forecast network operating expenditure for the fourth access arrangement period at $182.80 million[69], broken down as follows:

- baseline recurring network operating expenditure at $156.30 million;
- incremental recurring network operating expenditure at $24.70 million; and
- one-off network operating expenditure at $1.80 million.

216. ATCO's proposed forecast network operating expenditure for the fourth access arrangement period is equivalent to an annual allowance of $33.3 million, which is 19 per cent higher than the average annual amount of $27.9 million that ATCO spent during the third access arrangement period. [70]

217. ATCO's proposed network operating expenditure for the fourth access arrangement period shows that:[71]

- baseline recurring costs[72] are not expected to be materially different from the costs incurred in the third access arrangement period;
- one-off costs are immaterial; and therefore
- ATCO's forecast increase in network operating expenditure is largely driven by the inclusion of incremental recurring costs.

218. Figure 15 summarises ATCO's forecast baseline recurring, incremental recurring and one-off network operating expenditure for the fourth access arrangement period.

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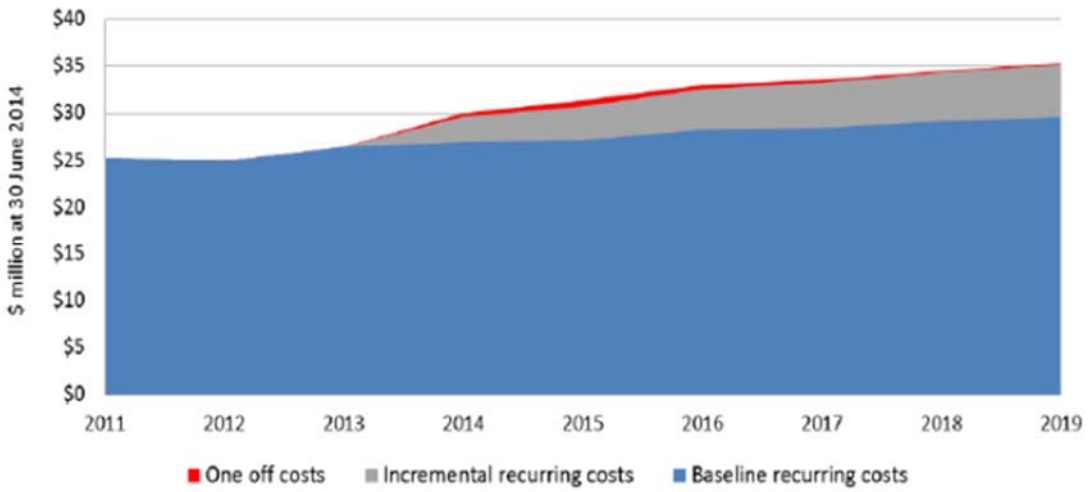
69 ATCO's forecast network operating expenditure has been updated. ATCO Gas Australia, *Email response to ERA20*, 4 July 2014.

70 EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 145-152.

71 EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, p. 147.

72 ATCO has assessed network operating expenditure drivers as baseline recurring costs (recurring costs required to operate and maintain the growing customer base and network footprint), incremental recurring costs (incremental costs in relation to new requirements or activities to comply with the safety case in the fourth access arrangement period, and expected to continue) and one-off costs (one off costs in relation to new requirements or activities to comply with the safety case in the fourth access arrangement period, and not expected to continue): ATCO Gas Australia, *Access Arrangement Information*, section 6.8.2, p. 91.

Figure 15 ATCO's Baseline Recurring, Incremental Recurring and One-off Network Operating Expenditure Forecast (AA4)



Source: ATCO, Access Arrangement Information, 17 March 2014, Figure 42

219. The Authority's technical consultant, EMCa, has focused on the incremental recurring costs and their interrelationship with the baseline recurring costs, in order to assess the consistency of ATCO's proposed expenditure on network operations with rules 74 and 91 of the NGR.

220. ATCO has proposed to spend $156.30 million on baseline recurring costs and $24.70 million on incremental recurring costs in the fourth access arrangement period. According to ATCO, the incremental recurring costs are driven by the Safety Case and the need to reduce risk to As Low As Reasonably Practicable (**ALARP**).[73]

221. Incremental recurring costs cover leak surveys, cathodic protection, commercial meter changes, systems monitoring, gas filter inspections, proving gas mains locations, technical compliance inspectors, asset services, the dial before you dig campaign and market services.

222. EMCa's concerns with ATCO's forecast incremental recurring costs relate to ATCO's forecasting approach, and the manner in which ATCO has applied the ALARP test when conducting its Formal Safety Assessments (**FSA**).

223. ATCO has described to EMCa its forecasting approach, which entails that relevant managers manually forecast future maintenance levels at an activity level.[74] ATCO has developed each of the activity levels and unit cost assumptions independently, and developed a total forecast as a sum of the underlying forecasts.

224. EMCa is concerned that ATCO's approach in forecasting incremental recurring costs results in a significant overstatement of forecast expenditure. EMCa assesses that the approach excludes consideration of the following:

- The relationship between monitoring and maintenance activities. For example, an increase in expenditure on monitoring should be offset by a decrease in reactive

[73] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 85-104.

[74] Site meetings with ATCO Gas Australia, April 9-10, 2014.

maintenance. EMCa considers there is no evidence that ATCO has taken this into account when developing its forecasts. The forecasts for monitoring, planned and reactive maintenance are instead all increasing over the fourth access arrangement period.

- The effect of ATCO's sustaining capital expenditure program, which has involved asset replacement, and expenditure on telemetry and monitoring. EMCa expects the program to impact the requirement to carry out unplanned and reactive maintenance, and/or on-site monitoring.
- Potential for efficiency gains by optimising baseline and incremental maintenance and inspection activities and carrying them out in an integrated, rather than incremental, manner. Examples include consolidation of planned activities, consolidation of leak detection surveys and main replacements, and replacement of existing baseline activities by ALARP activities.

225. The second concern that EMCa has raised in relation to ATCO's proposed allowance for incremental recurring network operating expenditure is that while ATCO has claimed that most of the expenditure is being driven by the need to 'comply with the requirements of the Safety Case',[75] it is largely being driven by the risk thresholds that ATCO has applied when conducting FSAs.

226. According to EMCa, the risk thresholds that ATCO has adopted are not prescribed in the relevant safety standards (AS/NZS4645 and AS2885), nor are they mandated by Energy*Safety*. The risk thresholds are predominantly based on ATCO's own risk appetite, and are low by industry standards. Furthermore, ATCO has not justified these thresholds in the manner required by the relevant standards AS/NZS4645 and AS2885. The Authority considers that these risk thresholds would give rise to inefficiently high levels of incremental recurring network operating expenditure.

227. EMCa considers that a revealed cost approach provides a reasonable means of determining a prudent and efficient forecast for network operating expenditure. EMCa considers that ATCO has had an incentive to reduce operating expenditure during the current access arrangement because it can capture all the cost savings. As a result, EMCa considers that the actual costs incurred by ATCO in 2013 form a reasonable basis for forecasting ATCO's recurring network operating expenditure.

228. Using ATCO's recurring network operating expenditure in 2013 as a baseline for determining forecast expenditure in the fourth access arrangement period, EMCa has then considered whether there is a reasonable justification to increase or decrease the forecast expenditure to reflect:

- costs of complying with new regulatory obligations in the fourth access arrangement period , including Safety Case requirements that were not part of incurred operating expenditure in the third access arrangement period;
- forecast increase in demand in the fourth access arrangement period, noting that EMCa has found that a significant proportion of ATCO's proposed expenditure on growth capital expenditure has not been justified under rule 79 and so the effect will not be as significant as ATCO may otherwise have assumed;
- productivity improvements in the fourth access arrangement period, when accounting for efficiencies associated with the new recurring activities; and/or

[75] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 59.

- unit cost increases in the fourth access arrangement period, which in aggregate increase the cost forecast by around five per cent.

229. The Authority is of the view that ATCO's allowance for baseline and incremental recurring operating expenditure should be based on ATCO's proposed level in 2014 and 2015, but capped at ATCO's proposed 2015 level of $30.70 million (sum of baseline recurring and incremental recurring expenditure in the 2015 column of Table 12) for the remainder of the fourth access arrangement period for the following reasons:

- ATCO will carry out some incremental activities in the fourth access arrangement period to comply with the Safety Case, which will result in a step increase from the 2013 level up to the 2015 level.
- By 2015, ATCO would be in a position to start to realise the types of efficiencies outlined in paragraph 224. This, in the Authority's view, would result in cost reductions that should more than offset unit cost increases that ATCO has applied, and the cost of any additional incremental activities as part of the Safety Case between 2016 and 2019 that ATCO has assumed.
- The majority of ATCO's proposed capital expenditure on the Two Rocks, Peel and Baldivis spur lines and the greenfield subdivision developments is expected to occur after 2015. Therefore, operating expenditure in relation to these projects would occur in the fifth access arrangement period, rather than the fourth. A further downward revision of network operating expenditure to reflect capital expenditure on these projects is therefore not required.

230. However, as noted in paragraph 214 of this Draft Decision, the Authority has decided to reject ATCO's proposed labour escalation. As a result, the Authority will remove the amount of labour escalation included in ATCO's proposed baseline and incremental recurring operating expenditure in 2015. ATCO did not include labour escalation in 2014. Labour escalation is effectively removed for the remaining years in the regulatory period through capping values at 2015 levels in real terms.

231. ATCO is proposing to spend $1.80 million on one-off activities in the fourth access arrangement period, such as in line inspections, PVC studies and pressure vessel inspections at pressure regulating stations. EMCa considers that ATCO's proposal to undertake these activities is consistent with both the Safety Case and good industry practice. The Authority considers that ATCO's proposed one-off network operating expenditure of $1.80 million satisfies rule 91 of the NGR.

232. The Authority has also noted that most of ATCO's business cases refer to productivity and efficiency gains from ATCO's proposed capital expenditure. However, ATCO has not provided evidence that it has quantified these gains or accounted for them in the proposed operating expenditure for the fourth access arrangement period.

233. EMCa has recommended that a ten per cent annual efficiency gain from the IT capital expenditure that ATCO has incurred in the third access arrangement period should be applied to ATCO's forecast IT operating expenditure for the fourth access arrangement period. EMCa has based its recommended ten per cent annual efficiency gain on the following:

- Efficiency gains that ATCO has identified in the business case for Field Mobility Phase 2.
- Efficiency gains that EMCa has observed from investment in IT-based improvement initiatives in its utility management experience.

234. In relation to the IT efficiency gain, the Authority has decided the following:

- IT efficiency gain is ten per cent of the Authority approved conforming IT capital expenditure for the third access arrangement period, which is equivalent to $1.10 million. The Authority considers that the efficiency gain should be calculated as a proportion of conforming IT capital expenditure for the third access arrangement period rather than proposed IT capital expenditure for the third access arrangement period.
- IT efficiency gain will be deducted from ATCO's proposed network operating expenditure for the fourth access arrangement period. Based on EMCa's analysis, the Authority considers that the gains from the IT capital expenditure incurred during the third access arrangement period would flow to network operating expenditure items.

235. The Authority has decided that of the $182.80 million[76] that ATCO proposes to spend on network operating expenditure in the fourth access arrangement period:

- $163.65 million satisfies rules 74 and 91 of the NGR.
- $19.15 million does not satisfy rules 74 and 91 of the NGR.

236. The Authority's approved forecast of $163.65 million on network operating expenditure in the fourth access arrangement period is based on the following:

- The Authority's assessment that only $168.30 million of ATCO's forecast baseline recurring and incremental recurring network operating expenditure of $181.00 million (network operating expenditure excluding one-off network operating expenditure) is consistent with rules 74 and 91 of the NGR because:
  - ATCO's approach in forecasting baseline recurring and incremental recurring network operating expenditure leads to a significant overstatement of forecast expenditure; and
  - ATCO's proposed risk thresholds for forecast baseline recurring and incremental recurring network operating expenditure, have not been assessed in the manner required by the relevant standards AS/NZS4645 and AS2885.
- The Authority's assessment that ATCO's proposed one-off network operating expenditure of $1.80 million satisfies rule 91 of the NGR.
- The Authority's decision to reject ATCO's proposed labour escalation factor of two per cent on the basis of rule 74 of the NGR, as noted in paragraph 214. The Authority's approved forecast of network operating expenditure excludes labour escalation of $0.40 million for 2015, and baselines network operating expenditure in real terms from 2015 - hence effectively removes labour escalation.[77]
- The Authority's decision to deduct an IT efficiency gain of $6.05 million. The IT efficiency gain is equivalent to ten per cent of the Authority approved conforming IT capital expenditure for the third access arrangement period under rule 91 of the NGR. The Authority's approved forecast of network operating expenditure excludes an annual IT efficiency gain of $1.10 million.

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[76] ATCO's forecast network operating expenditure has been updated as per ATCO Gas Australia, *Email response to ERA20*, 4 July 2014.

[77] ATCO Gas Australia, *Email response to ERA27*, 30 July 2014.

237. Table 12 shows ATCO's proposed network operating expenditure forecast, and the Authority's approved network operating expenditure forecast for the fourth access arrangement period.

Table 12 ATCO's Proposed Network Operating Expenditure Forecast and Authority's Approved Network Operating Expenditure Forecast (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
ATCO Proposed							
Baseline Recurring	13.60	27.10	28.30	28.50	29.20	29.60	156.30
Incremental Recurring	1.20	3.60	4.30	4.80	5.20	5.60	24.70
One-Off	0.20	0.60	0.40	0.30	0.10	0.20	1.80
ATCO Proposed Network Operating Expenditure	**15.00**	**31.30**	**33.00**	**33.60**	**34.50**	**35.40**	**182.80**
Authority Approved							
Baseline Recurring	13.60	27.10	27.10	27.10	27.10	27.10	149.10
Incremental Recurring	1.20	3.60	3.60	3.60	3.60	3.60	19.20
One-Off	0.20	0.60	0.40	0.30	0.10	0.20	1.80
Labour Cost De-escalation		(0.40)					
IT Efficiency Gain	(0.55)	(1.10)	(1.10)	(1.10)	(1.10)	(1.10)	(6.05)
Authority Approved Network Operating Expenditure	**14.45**	**29.80**	**30.00**	**29.90**	**29.70**	**29.80**	**163.65**

Source: ATCO Gas Australia, Access Arrangement Information, EMCa Review of Technical Aspects of the Proposed Access Arrangement, ERA, GDS Tariff Model, October 2014.

Corporate Operating Expenditure

238. ATCO has forecast corporate operating expenditure for the fourth access arrangement period at $132.16 million[78], broken down as follows:[79]

- corporate support, which ATCO forecasts to increase to $91.48 million over the fourth access arrangement period;
- business development and marketing, which ATCO proposes to increase to $24.61 million over the fourth access arrangement period; and

[78] ATCO Gas Australia, *Tariff Model*, September 2014.

[79] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 70-85.

- license fees to Energy*Safety*, Economic Regulation Authority, Energy Industry Ombudsman, Retail Energy Market Company, Department of Mines and Petroleum, Office of the Gas Disputes Arbitrator, and Department of Regional Development and Lands, which ATCO forecasts at $16.07 million for the fourth access arrangement period. [80]

Corporate Operating Expenditure: Corporate Support

239. ATCO has forecast an increase in corporate support operating expenditure to $91.48 million over the fourth access arrangement period. Corporate support operating expenditure can be broken down into the following:

- Internal support costs, which are forecast by ATCO to total $63.53 million, and cover the following:
  - Finance and tax;
  - Human resources and corporate affairs;
  - Legal and regulatory; and
  - IT cost centre.
- Intercompany charges, which are forecast at $27.96 million.[81]

240. Finance and tax internal support costs include the costs required to manage the ongoing legislative, regulatory and standard transactional requirements. These costs are forecast by ATCO to increase by 24 per cent[82] from 2011 to 2019. The headcount for this cost centre is forecast to increase by two staff members.[83,84]

241. ATCO has forecast that human resources and corporate affairs internal support costs will increase by 56 per cent[85] from 2011 to 2019. ATCO has attributed the increase to the growth of the human resources and corporate affairs team by seven staff members by 2015. ATCO has forecast modest real increases for the remainder of the fourth access arrangement period as a result of an increase in real remuneration.

242. ATCO has forecast that legal and regulatory internal support costs will be 78 per cent[86] higher in 2019 than in 2011. This increase is largely driven by an additional eight staff, and additional preparation costs for the proposed revised access arrangements for the fourth and fifth access arrangement periods. EMCa estimates that ATCO has or will spend approximately $2.10 million on preparation costs for this proposed revised access arrangement. ATCO forecasts spending approximately $2.40 million on preparation costs for the proposed revised access arrangement for the fifth access arrangement period in 2018 and 2019.

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80 ATCO provided an updated forecast of $14.34 million for license fee corporate operating expenditure for the fourth access arrangement period: ATCO Gas Australia, *Email response to ERA33*, 31 July 2014.

81 The sub-components of corporate support costs do not add to $91.48 million due to rounding.

82 Attachment to ATCO Gas Australia, *Email response to question EMCa40*, 17 April 2014.

83 ATCO Gas Australia, *Email response to question EMCa63*, 28 April 2014.

84 Measured by full-time equivalents.

85 Attachment to ATCO Gas Australia, *Email response to question EMCa40*, 17 April 2014.

86 Attachment to ATCO Gas Australia, *Email response to question EMCa40*, 17 April 2014.

243. EMCa considers that ATCO has not provided sufficient justification for the step increase in legal and regulatory internal support costs above the 2013 level, except for the estimated amount of $2.10 million for the preparation of a proposed revised access arrangement for the fourth access arrangement period. Accordingly, the Authority considers that only $2.10 million expenditure on preparation costs for the proposed revised access arrangement for the fifth access arrangement period is prudent and justified as a step increase during the fourth access arrangement period. The Authority considers that the same costs would be required for the preparation of revised access arrangements for both the fourth and fifth access arrangement periods. The Authority considers that this step increase should be divided over 2018 and 2019.

244. ATCO has forecast that IT cost centre internal support costs will increase by 128 per cent[87] between 2011 and 2019. The headcount for this cost centre is forecast to increase by five. ATCO has stated that the need arises from its proposed significant investment in IT replacement and transformational projects during the third and fourth access arrangement periods. ATCO has based this forecast on its IT service agreement with I-Tek. On 29 August 2014, ATCO provided the Authority with information in relation to the update of its IT service agreement. However, ATCO has not provided information on what impact the revised IT service agreement would have on its forecast IT internal support costs.[88]

245. ATCO has described intercompany charges as providing a cost effective source of executive support and governance from ATCO Group. Intercompany charges increased by $0.3 million between 2011 and 2013.[89] ATCO attributes the increase in intercompany charges to the intercompany allocation method (Massachusetts Method)[90], and the increase in the size of ATCO's business. ATCO has not provided information to indicate that there has been an increase in actual services received by ATCO from the ATCO Group, commensurate with the increase in charges.

246. The Massachusetts Method is used to allocate intercompany support charges to ATCO and other utility businesses in the ATCO Group.[91] The method replaces the method that has been approved for the current access arrangement. There is an implicit assumption in the Massachusetts Method that the larger the utility, the more it will draw on the group support services. ATCO states that the Massachusetts Method has been approved by the Alberta Utilities Commission, though this has no jurisdictional authority over ATCO Gas Australia.

247. ATCO has proposed an increase in both internal corporate support costs and intercompany charges. EMCa considers that if ATCO has been making full use of ATCO Group services that it is paying for through the intercompany charges, then ATCO would not have also projected such an increase in its spending on internal corporate support costs. EMCa considers that ATCO's forecast corporate support

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87 Attachment to ATCO Gas Australia, *Email response to question EMCa40*, 17 April 2014.

88 ATCO Gas Australia, *Letter to the Authority*, 29 August 2014.

89 Attachment to ATCO Gas Australia, *Email response to question EMCa40*, 17 April 2014.

90 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 74: "updated intercompany costs were only charged to ATCO Gas Australia from January 2013.

91 The American Gas Association defines the "Massachusetts Method" as a method used to allocate costs incurred by a parent company on behalf of its affiliates to those affiliates. The "mass formula" has three parts using the allocation factors (ratios comparing the affiliate to the company as a whole) of gross plant, gross revenues, and labour, which are added together and then divided by three to arrive at a simple average of the three factors. This formula attempts to weigh various aspects of each of the affiliates so that a fair distribution of the overhead cost is allocated.

ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 73-74.

operating expenditure indicates that ATCO is not making full use of ATCO Group support and services.

248. The Authority considers that ATCO has not provided evidence to indicate that any intercompany services it receives are necessary, nor that it has assessed the implied intercompany charges to be prudent or efficient. The Authority considers that ATCO should demonstrate the following:

- The degree of governance over the services and support it can access from ATCO Group, and that it has exercised prudent judgement to determine efficiency of said services and support; and
- Whether other components of the corporate support operating expenditure need to increase to such an extent at the same time that intercompany charges have increased and are forecast to increase dramatically.

249. The Authority considers that the provision of corporate support services of the nature provided by the cost centres described above are a necessary function of the prudent operation of a large business. However, the Authority is not satisfied that ATCO's proposed corporate support operating expenditure is consistent with what a prudent service provider acting efficiently, in accordance with good industry practice, to achieve the lowest sustainable cost, would incur because of the following:

- ATCO has not adequately justified the need for significant increases in forecast internal support costs; and
- ATCO has not demonstrated the value received from the forecast intercompany charges.

250. As a result, the Authority is not satisfied that the annual forecast corporate support expenditure, which includes both internal support costs and intercompany charges, should be increased above the level of corporate support expenditure incurred by ATCO in 2013 of $12.30 million[92] ($67.65 million over five and a half years). The Authority considers that the expenditure for 2013 represents the best forecast possible in the circumstances and is arrived at on a reasonable basis for the following reasons:

- ATCO has had an incentive to reduce operating expenditure in the current access arrangement because it can capture the resulting cost savings, so its revealed costs in 2013 should form a reasonable basis for determining the allowance required for corporate support operating expenditure; and
- by 2013, ATCO would have had two years to determine the efficient corporate support spending level following its due diligence during the GDS purchase process.

251. However, the Authority has allowed one-off expenditure of $2.10 million for the preparation of the next access arrangement proposal, divided between 2018 and 2019, which, in the Authority's view, represents a reasonable forecast of the costs to be incurred based on the costs relating to the proposed access arrangement proposal for the fourth access arrangement period.

252. In total, the Authority has accepted $69.75 million of the $91.48 million of corporate support operating expenditure proposed by ATCO as satisfying rules 74 and 91 of the NGR.

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[92] ATCO Gas Australia, *Email Response to EMCa22*, 4 April 2014.

Corporate Operating Expenditure: Business Development and Marketing

253. ATCO proposes to spend $24.61 million on business development and marketing operating expenditure over the fourth access arrangement period, which would cover:[93]

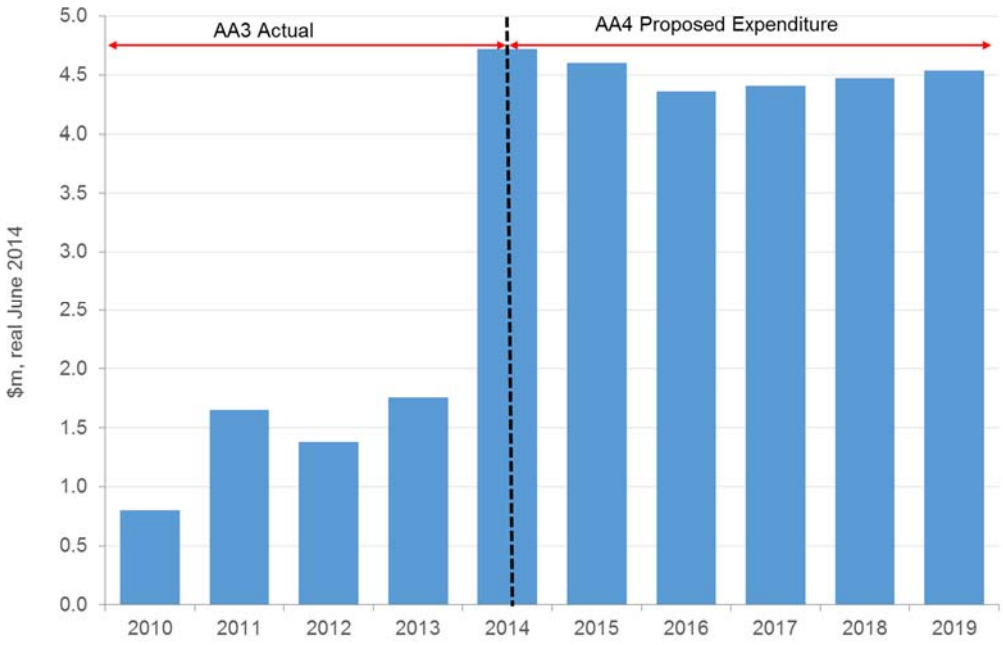
- Advertising and promotions (42 per cent):
  - New connection process.
  - Positioning ATCO as an energy solutions provider.
- Incentives (22 per cent):
  - Free of cost gas reticulation for land developers for all new developments around GDS.
  - Low or no cost spur line expansion for land developers when the requirement for gas is included within Developer Guidelines.
  - Incentives for low or no cost service connections for new and established homes.
- Appliance demonstration and education (24 per cent):
  - Influence builders to include gas appliances in builders' standard range.
  - Promote key gas appliances.
- Strategy and innovation (9 per cent):
  - Technology research on distributed generation.
- Website and social media (3 per cent).

254. Figure 16 shows ATCO's actual and forecast business development and marketing operating expenditure.

[93] ATCO has confirmed the business development and marketing operating expenditure forecast of $24.6 million, but has provided a breakdown that adds up to $20.8 million. In the absence of a correct breakdown, the Draft Decision presents the different components in per cent amounts in order to provide an indication of their magnitude:

ATCO Gas Australia, *Email response to EMCa79*, 8 May 2014.

Figure 16 ATCO's Actual and Forecast Business Development and Marketing Operating Expenditure (AA3 and AA4)



Source: ATCO Gas Australia, Email response to EMCa79, 8 May 2014 and EMCa analysis

255. EMCa has assessed ATCO's Net Present Value (**NPV**) analysis of its proposed business development and marketing operating expenditure. EMCa has advised that ATCO has not demonstrated to a sufficient level of confidence that the proposed expenditure will lead to lower sustainable costs for consumers. Nor has ATCO demonstrated that the proposed expenditure is consistent with rule 91 of the NGR. Therefore, EMCa recommends that ATCO's proposed increase in business development and marketing operating expenditure should be rejected.

256. EMCa considers that the actual business development and marketing operating expenditure that ATCO has chosen to spend from 2011 to 2013 can be considered a reasonable and efficient level, based on ATCO's commercial incentives to incur operating expenditure at an efficient level and to try and increase demand. EMCa considers that the amount that ATCO has spent on business development and marketing in 2013 provides a reasonable basis for forecast expenditure for the fourth access arrangement period. The amount spent by ATCO in 2013 was $1.76 million.[94] This is equivalent to $9.68 million over the five and a half years of the fourth access arrangement period.

257. ATCO has underspent the Authority approved forecast for business development and marketing during the third access arrangement period by approximately $5.4 million.[95] ATCO has sought to attribute this underspend on a review of the marketing direction, which was completed in 2013. The review was undertaken following two corporate restructures:

- internalisation of the network business from its organisational structure under prior ownership in 2010; and

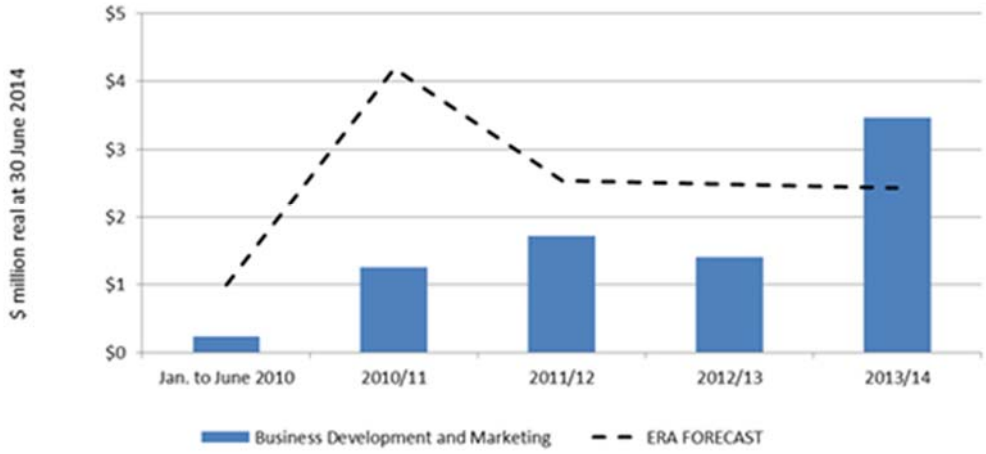
[94] ATCO Gas Australia, *Email response to EMCa79*, 8 May 2014.

[95] ATCO Gas Australia, *Email response to EMCa79*, 8 May 2014.

- acquisition of the network business by ATCO Group in July 2011.

258. Figure 17 shows ATCO's forecast and actual business development and marketing operating expenditure for the third access arrangement period.

Figure 17 ATCO's Actual and Forecast Business Development and Marketing Operating Expenditure (AA3)



Source: ATCO, Access Arrangement Information, Figure 37 corrected as per ATCO Gas Australia, Email response to EMCa79, 8 May 2014.

259. ATCO has noted the difficulty in trying to increase connections and consumption in Western Australia compared to other Australian gas distribution networks. This is because of the State's mild to hot climate.

260. According to ATCO, its marketing plan seeks to address declining consumption, and limited growth rates in new connections. The reasons for the declining residential consumption that were cited by ATCO include the following:

- substitutes to gas appliances, including electricity and solar appliances;
- energy efficient housing design, which has reduced space heating and cooling needs; and
- electricity price subsidies.

261. In support of its proposed business development and marketing operating expenditure, ATCO has pointed to a benchmark study that shows that its proposed expenditure of $5.37 per customer is commensurate with a select peer group (including Envestra in Victoria, ActewAGL in the ACT and Jemena in NSW).[96] However, ATCO has not been able to demonstrate that the investment by other regulated gas businesses has been effective, because each of the benchmarked business development and marketing programs is in its infancy. Therefore, the Authority considers that the benchmarking information does not provide evidence that ATCO would be acting efficiently and in accordance with good industry practice in undertaking its proposed program.

[96] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 14, p. 78.

262. This finding has been confirmed by EMCa's review of ATCO's NPV analysis of its proposed business development and marketing program.[97]

263. According to ATCO's NPV analysis[98], the proposed business development and marketing operating expenditure of $24.61 million over AA4 will yield a positive $1.05 million NPV, with a payback period of ten years.

264. ATCO's analysis shows that the NPV of the proposed business development and marketing operating expenditure does not become positive for ten years. Therefore, ATCO's proposed business development and marketing program would only achieve lower tariffs for GDS customers after ten years. EMCa considers that a payback period of ten years is too high for a business development and marketing program. Today's gas customers may never see the payback if they exit the network before the ten year period. These customers would therefore be effectively subsidising the lower tariffs for future gas customers.

265. Based on EMCa's review of ATCO's NPV analysis, the Authority has two significant concerns in relation to ATCO's assessment that the proposed business development and marketing operating expenditure is prudent and will achieve the lowest sustainable cost of delivery:

- the average consumption that ATCO has assumed for new customers (as opposed to existing customers) seems high relative to actual consumption data that ATCO has provided to EMCa in response to relevant information requests; and
- while ATCO has not justified the individual initiatives within its overall program, it would appear from the more granular information that is in its model that the proposed level of business development and marketing operating expenditure is relatively high for the customer groups that deliver low benefits. In particular, it appears that the significant focus of expenditure on residential customers may not be justified in relation to the benefits. This suggests that some elements of the program may have a net benefit, while some elements do not.

266. The majority of the new connections that ATCO is targeting are in the B2 and B3 tariff classes. ATCO's assumed annual consumption for each additional B2 and B3 connection is higher than the revealed consumption of such new connections. Compared with ATCO's model assumption of consumption of 16.2GJ/year for each B3 customer, the average consumption for all new connections made since 2009 in 2013 was 13GJ, while the average consumption of the most recently-connected customers is 11.62GJ. A similar pattern applies to B2 customers. While this lift in average consumption may appear small, EMCa's sensitivity analysis has concluded that without it, ATCO's business development and marketing program would have a negative NPV.

267. Moreover, EMCa has noted significant contributions to the business case from ATCO's assumed three A2 and ten B1 connections per year. The contributions total over $1 million per year, or 27 per cent of the assumed increase in haulage revenue. EMCa considers that these additional connections could not realistically be attributed to ATCO's business development and marketing program. This is because the program is proposed to target general advertising, websites and social media, appliance demonstrations and new connection subsidies, the targets of the overwhelming

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97 ATCO Gas Australia, *"Financial Evaluation Model"*, attachment to email response to EMCa15, 10 April 2014.

98 ATCO Gas Australia, Response to EMCa15, 10 April 2014

majority of which are households. EMCa expects that obtaining an additional 13 large customer connections per year would be best achieved by focused marketing and sales efforts from existing staff, rather than mass market campaigns and subsidies. That being the case, the benefit correctly attributable to the proposed expenditure will primarily arise from additional B3 connections and (to the extent that it is valid) any uplift in annual usage from the existing customer base.

268. EMCa has performed a sensitivity analysis of ATCO's NPV result to the assumptions that ATCO has made about the following:

- average volume of gas that new B2 and B3 customers will consume;
- A2 and B1 customers being targeted by the business development and marketing program; and
- customers (new and existing) increasing their consumption by 0.05 GJ per year in response to the business development and marketing program.

269. The results of EMCa's sensitivity analysis indicate that:

- If the average volume of gas consumed by B2 and B3 customers is based on actual volumes for recent newly connected customers, then the NPV becomes negative;
- If A2 and B1 customers are excluded from the analysis, then the NPV becomes negative; and
- If the assumed uplift in consumption across all customers is excluded from the analysis, then the NPV is again negative.

270. The Authority considers that each of the above three sensitivity scenarios is credible. The Authority is concerned that under each of these scenarios, GDS customers would be worse off if the business development and marketing program was undertaken.

271. ATCO's model also contains a worst case scenario analysis, which also yields a negative NPV.

272. Moreover, the Authority has received submissions from both gas retailers, Alinta and Kleenheat[99], which are consistent with EMCa's review. Alinta considers that ATCO's advertising campaign is high cost and supports very small increases in new connections (on average 1,316 per year) at a cost of approximately $3,000 per new connection. Alinta has questioned the value of ATCO's marketing activities outside incentives for new customer connections and a general promotion of the "gas is good" message.

Corporate Operating Expenditure: License Fees

273. ATCO forecast $16.07 million for license fee corporate operating expenditure for the fourth access arrangement period. When requested by the Authority to provide a breakdown of license fees, ATCO provided an updated forecast of $14.34 million for license fee corporate operating expenditure for the fourth access arrangement

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[99] Alinta Energy, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014.

Kleenheat Gas, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014.

period.[100] ATCO did not provide a rationale for forecasting a doubling of actual WA Energy Disputes Arbitrator charges in the forecast.[101] The Authority has adjusted industry charges for the WA Energy Disputes Arbitrator to be consistent with historical levels.

274. The Authority has adjusted ATCO's license fee corporate operating expenditure for the fourth access arrangement period to be $14.30 million.

Corporate Operating Expenditure - Summary

275. The Authority has decided that of the $132.16 million[102] that ATCO proposes to spend on corporate operating expenditure in the fourth access arrangement period:

- $93.73 million satisfies rules 74 and 91 of the NGR.
- $38.43 million does not satisfy rules 74 and 91 of the NGR.

276. The Authority's approved forecast of $93.73 million on corporate operating expenditure in the fourth access arrangement period is based on the following:

- Authority's assessment that only $69.75 million of ATCO's forecast corporate support operating expenditure is consistent with rule 91 of the NGR (refer to paragraphs 239 to 252).
- Authority's assessment that only $9.68 million of ATCO's proposed business development and marketing operating expenditure satisfies rule 91 of the NGR (refer to paragraphs 253 to 272).
- Authority's assessment that only $14.30 million of ATCO's proposed license fees satisfies rule 74 of the NGR (refer to paragraphs 273 to 274).
- Authority's decision to reject ATCO's proposed labour escalation factor of two per cent on the basis of rule 74 of the NGR (refer to paragraphs 208 to 214). The Authority's approved forecast of corporate operating expenditure uses 2013 as a baseline, and thus excludes labour escalation. Moreover, license fees are not impacted by labour escalation.

277. Table 13 shows ATCO's proposed corporate operating expenditure forecast, and the Authority's approved corporate operating expenditure forecast for the fourth access arrangement period.

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100 ATCO Gas Australia, *Email response to ERA33*, 31 July 2014.

101 ATCO Gas Australia, *Email Response to ERA51*, 9 September 2014:

Historically, ATCO Gas has received WA Energy Disputes Arbitrator charges in excess of $5,000 in a single year period. ATCO Gas Australia has conservatively budgeted based on previous historical spend with the inclusion of a safety net to ensure that these costs can be met in any single year period. A forecast of approximately $13,000 per year was included in ATCO's AA4 forecast.

102 ATCO's forecast network operating expenditure has been updated as per ATCO Gas Australia, *Email response to ERA20*, 4 July 2014.

Table 13 ATCO's Proposed Corporate Operating Expenditure Forecast and Authority's Approved Corporate Operating Expenditure Forecast (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
ATCO Proposed							
Corporate Support	8.00	16.60	15.60	16.28	17.28	17.71	91.48
Business Development and Marketing	2.23	4.60	4.36	4.41	4.47	4.54	24.61
License Fees	1.29	2.71	2.82	2.95	3.08	3.22	16.07
ATCO Proposed Corporate Operating Expenditure	**11.52**	**23.90**	**22.80**	**23.64**	**24.83**	**25.47**	**132.16**
Authority Approved							
Corporate Support	6.15	12.30	12.30	12.30	13.35	13.35	69.75
Business Development and Marketing	0.88	1.76	1.76	1.76	1.76	1.76	9.68
License fees	1.43	2.61	2.50	2.53	2.57	2.67	14.30
Authority Approved Corporate Operating Expenditure	**8.46**	**16.67**	**16.56**	**16.59**	**17.68**	**17.78**	**93.73**

Source: ATCO Gas Australia Access Arrangement Information, EMCa Review of Technical Aspects of the Proposed Access Arrangement, ERA, GDS Tariff Model, October 2014.

IT Operating Expenditure

278. ATCO receives IT services from I-Tek under an IT Service Agreement (**ITSA**).[103] In the access arrangement revisions submitted in March 2014 ATCO has based its IT operating expenditure forecast on the continuation of the I-Tek ITSA beyond January 2015. ATCO also stated in the proposed revised access arrangement that it will review its options to revise the ITSA by 30 June 2014. On 17 July 2014, ATCO Group advised the Authority that I-Tek would be sold to Wipro. Following a request from the Authority, ATCO provided an overview of the impact of the I-Tek ITSA update on ATCO's proposed revised access arrangement on 29 August 2014.

279. The components of the IT operating expenditure are IT license fees, an IT usage fee and an IT services fee.

[103] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 110-117.

280. To assist the Authority in assessing the consistency of ATCO's proposed IT operating expenditure with rules 91 and 74, EMCa examined the assumptions that ATCO has made about the IT license fees, IT usage fee and IT services fee.[104] EMCa's assessment was based on ATCO's IT service agreement with I-Tek and corresponding IT operating expenditure forecast, which was submitted when ATCO lodged the proposed revised access arrangement on 17 March 2014. The Authority has subsequently revisited EMCa's assessment based on ATCO's revised IT operating expenditure forecast as a result of updating the IT service agreement.[105]

281. ATCO's IT Asset Management Plan (**AMP**) outlines ATCO's asset replacement and maintenance program. [redacted] ATCO has not provided any evidence to demonstrate that the expenditure on these projects is consistent with the costs that would be incurred by a prudent service provider acting efficiently.

282. A number of the initiatives described in the IT AMP indicate that there will be efficiency gains in addition to other business improvements. ATCO has not quantified these benefits in the IT AMP nor the proposed revised access arrangement, and has not provided a business case that indicates quantification of the nominated benefits.

283. [redacted]

284. Furthermore, ATCO has not demonstrated its capacity to undertake these projects given the following:

- significant increase in proposed activity in the fourth access arrangement period; and
- limitations to ATCO's capacity to develop and implement IT projects.

IT Operating Expenditure: IT License Fees

285. IT license fees cover all vendor provided software used by ATCO, for which vendors levy a fee on a per user basis as well as an annual maintenance fee.[109]

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104 EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 167-176.

105 ATCO Gas Australia, *Letter to the Authority*, 29 August 2014.

106 ATCO Gas Australia, *IT Asset Management Plan 2014-2019*, Figure 12.

107 ATCO Gas Australia, *IT Asset Management Plan 2014-2019*, Figure 12.

108 ATCO Gas Australia, *IT Asset Management Plan 2014-2019*, Figure 12.

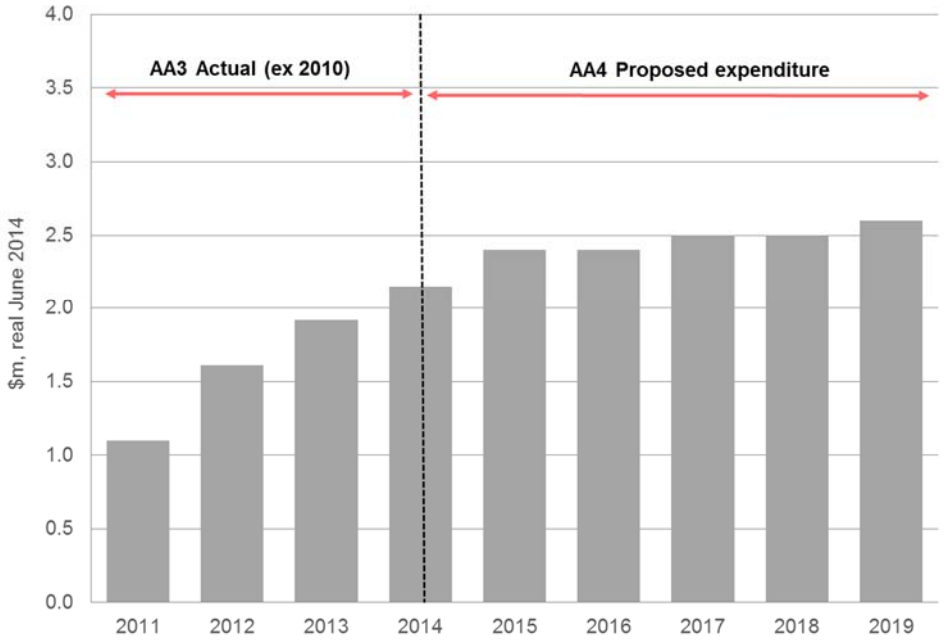
109 ATCO Gas Australia, *Access Arrangement Information*, p. 110.

286. ATCO initially proposed spending $13.46 million on IT licence fees in the fourth access arrangement period.[110] ATCO attributed the increase in IT license fees to the following:

- Instituting new applications and integrating them with existing applications.
- ATCO's proposed increase in headcount.

287. Figure 18 shows ATCO's actual IT license fees for the third access arrangement period, and forecast IT license fees for the fourth access arrangement period.

Figure 18 ATCO Actual and Forecast IT License Fees (AA3 and AA4)



Source: EMCa analysis based on ATCO, IT AMP, March 2014, tables 7 and 11 and Appendix 2.

288. EMCa was of the view that the proposed expenditure satisfies rule 91 of the NGR, and the forecasts are consistent with rule 74 of the NGR.

289. When ATCO provided an overview of the impact of the I-Tek ITSA update on ATCO's proposed revised access arrangement, ATCO updated its forecast IT license fees to $14.40 million. ATCO attributed the increase in forecast IT license fees to the update of the IT service agreement, and requirement to obtain licenses for purchased IT assets.

290. The Authority understands that IT license fees expenditure covers vendor-supported software that is used by ATCO. ATCO procures this software either through re-negotiation with existing vendors, or through competitive procurement. The Authority has not received supporting information from ATCO that links the IT license fee forecast with the IT service agreement update and proposed capital expenditure.

291. The Authority rejects ATCO's proposed increase of $0.94 million in forecast IT license fee operating expenditure for the fourth access arrangement period on the basis of rule 74 of the NGR. The Authority considers that ATCO has not demonstrated that the estimate was arrived at on a reasonable basis and is the best forecast or estimate

[110] ATCO Gas Australia, *Access Arrangement Information*, Table 22, p. 110.

possible in the circumstances. The Authority's approved forecast of IT license fee operating expenditure for the fourth access arrangement period is $13.46 million.

IT Operating Expenditure: IT Usage Fee

292. The IT Usage Fee covers essential shared IT hardware and software infrastructure upon which all ATCO Gas Australia corporate IT systems reside and operate.[111]

293. [redacted]

294. ATCO initially proposed spending $20.10 million[112] on the IT usage fee in the fourth access arrangement period, which is $11 million[113] higher than the cost in the third access arrangement period. When ATCO provided an overview of the impact of its revised IT arrangements with Wipro on ATCO's proposed revised access arrangement, ATCO revised the forecast IT usage fee to $0.20 million over the fourth access arrangement period. ATCO explained that the updated ITSA with Wipro is based on a different delivery model, in which ATCO does not pay a usage fee. The forecast IT usage fee of $0.20 million would reflect the arrangement with I-Tek until the ITSA with Wipro comes into effect.

295. The Authority approves ATCO's proposed decrease of $19.90 million in forecast IT usage fee operating expenditure for the fourth access arrangement period. The Authority's approved forecast of IT usage fee operating expenditure for the fourth access arrangement period is $0.20 million.

IT Operating Expenditure: IT Services Fee

296. The IT Services Fee covers IT support for telephony, telecommunications, network servers, security monitoring, applications, desktop support of ATCO's direct and shared systems, incident management, back-up and Disaster Recovery/Business Continuity Planning readiness, change and release management.[114]

297. ATCO has initially proposed spending $33.55 million[115] on IT services fee in the fourth access arrangement period, which is $13 million higher than it paid in the third access arrangement period. ATCO has sought to attribute the increase to the change in corporate ownership and the need to support new and replacement IT systems. When

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111 ATCO Gas Australia, *Access Arrangement Information*, p. 110.

112 ATCO Gas Australia, *Access Arrangement Information*, Table 22, p. 109.

113 ATCO Gas Australia, *IT Asset Management Plan 2014-2019*, Tables 7 and 11 and Appendix 2.

114 ATCO Gas Australia, *Access Arrangement Information*, p. 110.

115 ATCO Gas Australia, *Access Arrangement Information*, Table 22, p. 110.

ATCO provided an overview of the impact of the I-Tek ITSA update on ATCO's proposed revised access arrangement, ATCO updated its forecast IT services fee to $44.10 million.

298. Based on EMCa's advice, the Authority is not satisfied that any proposed increase in IT services fee from the 2013 level is consistent with rule 91 of the NGR. EMCa recommends that the IT services fee be capped at the 2013 level of $5.45 million[116] to reasonably reflect the lower fee to support new systems and the relative maturity of the existing services (by 2013).

299. While ATCO has provided a list of new [and replacement] IT systems that are driving the proposed increase in costs, EMCa noted two concerns:

- The link between the new systems and the requirement for continually rising IT services fee is not compelling. EMCa expects that the requisite telephony, telecommunications, network servers, security monitoring, applications, desktop support, incident management, back-up, and change and release management would have been right sized by the end of the third access arrangement period, by when all the nominated systems have been in place; and
- The evidence that ATCO has sufficient capacity and capability to develop and implement the multiple proposed projects is not compelling.

300. As EMCa has recommended that ATCO is likely to undertake fewer IT-projects in the fourth access arrangement period, EMCa recommends a reduction in the IT services fee.

301. On the basis of its review of EMCa's assessment the Authority considers that ATCO's proposed IT service fee operating expenditure is not consistent with the requirements of rule 91 of the NGR, and should be capped at $5.45 million per year from 2014 to 2019, because the link between the new systems and the evidence to support the requirement for continually rising IT service fees is not that which would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of delivering pipeline services. Therefore, the Authority's approved forecast of IT service fee operating expenditure for the five and a half years of the fourth access arrangement period is $30.01 million.

IT Operating Expenditure: Summary

302. The Authority has decided that of the $58.70 million of IT operating expenditure that is forecast by ATCO for the fourth access arrangement period:

- $43.67 million satisfies rules 74 and 91 of the NGR; and
- $15.03 million does not satisfy rules 74 and 91 of the NGR.

303. Table 14 shows ATCO's proposed IT operating expenditure forecast on 29 August 2014, and the Authority approved IT operating expenditure forecast for the fourth access arrangement period.

[116] ATCO Gas Australia, *IT Asset Management Plan 2014-2019*.

Table 14 ATCO's Proposed IT Operating Expenditure Forecast and Authority Approved IT Operating Expenditure Forecast (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
ATCO Proposed							
IT License Fees	1.20	2.50	2.60	2.60	2.70	2.80	14.40
IT Usage Fee	0.20	-	-	-	-	-	0.20
IT Services Fee	3.50	8.20	8.30	8.30	8.00	7.80	44.10
ATCO Proposed IT Operating Expenditure	**4.90**	**10.70**	**10.90**	**10.90**	**10.70**	**10.60**	**58.70**
Authority Approved							
IT License Fees	1.12	2.37	2.43	2.45	2.53	2.56	13.46
IT Usage Fee	0.20	-	-	-	-	-	0.20
IT Services Fee	2.73	5.45	5.45	5.45	5.45	5.45	30.01
Authority Approved IT Operating Expenditure	**4.05**	**7.82**	**7.88**	**7.91**	**7.98**	**8.02**	**43.67**

Source: ATCO Gas Australia Letter to the Authority 29 August 2014, EMCa Review of Technical Aspects of the Proposed Access Arrangement, ERA, GDS Tariff Model, October 2014.

UAFG Operating Expenditure

304. On 30 July 2014, ATCO updated its forecast UAFG operating expenditure to $43.70 million for the fourth access arrangement period based on the conclusion of a competitive tender to purchase UAFG gas.[117] ATCO has forecast an increase in UAFG operating expenditure in the fourth access arrangement period based on the following assumptions:[118]

- ATCO has assumed that the UAFG rate will increase in July-December 2014 to 2.67 per cent and then decrease gradually to 2.60 per cent.
- ATCO has assumed that total GDS throughput will increase from 27,579 in 2014 to 30,574 TJ in 2019.

305. EMCa sought further information from ATCO on the implication of ATCO's assumption that UAFG would rise from 2.60 per cent in 2013 to 2.67 per cent in 2014, and take five years to return to its 2013 level.[119] The monthly data provided by ATCO for the first eleven months of 2013 indicates that the average UAFG rate was 2.76 per cent, while the minimum rate over this period was 2.65 per cent.[120] The 2.67 per cent starting

[117] ATCO Gas Australia, *Letter to ERA*, 30 July 2014.

[118] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 104-110.

[119] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Figure 52.

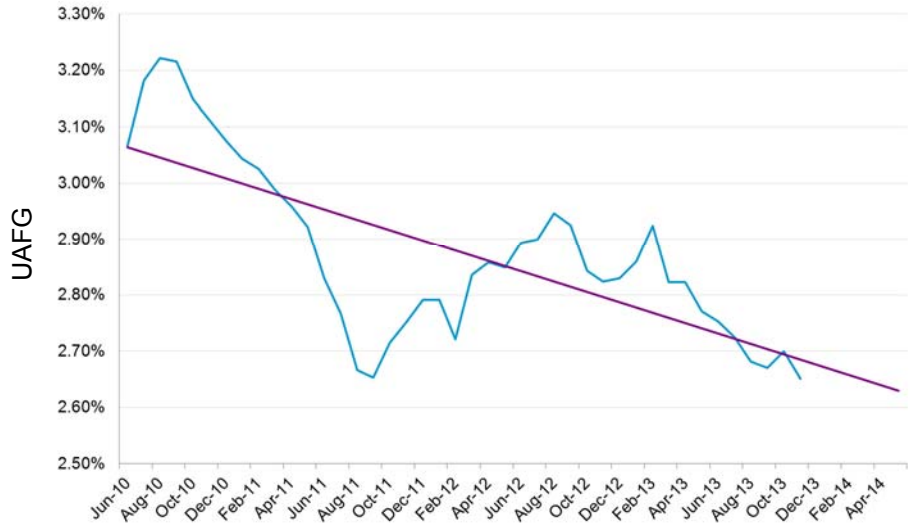
[120] ATCO Gas Australia, *Attachment to email response to EMCa78*, 2 May 2014.

point that ATCO has used when projecting the path that the UAFG rate will take over the fourth access arrangement period appears to have been set by reference to an observed rate in 2013.

306. EMCa is of the view that the starting point for the UAFG rate for the fourth access arrangement period should be set by reference to the trend line observed for the third access arrangement period (2.62 per cent), rather than a single observation.[121] This is because the UAFG rate can exhibit some volatility throughout the year and over time.

307. Figure 19 demonstrates ATCO's UAFG trend in the current access arrangement period.

Figure 19 ATCO's Actual UAFG Trend (AA3)



Source: ATCO Gas Australia, Attachment to email response to EMCa78, 2 May 2014

308. Over the third access arrangement period, ATCO's performance data does not show a deterioration in performance outcomes. ATCO has succeeded in reducing the rate of UAFG over the last three years, with the rate falling from over three per cent to 2.65 per cent in December 2013. ATCO's performance has exceeded its proposed targets in each of its nominated Key Performance Indicators (**KPI**), which indicates an overall improvement in performance outcomes. ATCO has not provided evidence to support any assertion that its performance level during the third access arrangement period has been unsatisfactory.

309. ATCO has noted that when deriving the assumed percentage reduction in the UAFG rate for the fourth access arrangement period, it has sought to take into account the asset replacement program, turbine meter replacement program (A1 and A2 customers), and improved metering accuracy (B1, B2 and B3 customers).

310. Since the Authority's adjusted total operating expenditure forecast for the fourth access arrangement period exceeds ATCO's total operating expenditure during the third access arrangement period on an annualised basis, ATCO's performance outcomes

[121] EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 176-180.

are not expected to be impaired if ATCO incurs the adjusted total operating expenditure for the fourth access arrangement period.

311. In its initial proposed revised access arrangement, ATCO used a placeholder value for the UAFG based on an assumed gas price. ATCO initiated a competitive tender for the purchase of UAFG, and has replaced the placeholder value based on a reduced average UAFG price.[122] After considering EMCa's advice, the Authority considers ATCO's proposal to conduct a competitive tender to acquire UAFG to be consistent with both good industry practice and rule 91 of the NGR.

312. ATCO's throughput estimates are based on its demand forecast. The Authority has adjusted ATCO's demand forecast based on a revision of per customer usage assumptions for new customers and the rejection of ATCO's proposed customer initiated greenfield capital expenditure.[123] Accordingly, the Authority has adjusted the GDS throughput that is used in calculating UAFG operating expenditure for the fourth access arrangement period.

313. In line with EMCa's recommendations, the Authority requires ATCO's UAFG operating expenditure forecast for the fourth access arrangement period be revised to reflect the following:

- change in the starting point used to project the UAFG rate over the fourth access arrangement period to the third access arrangement period trend (2.62 per cent). The revision is required to ensure compliance with rule 74 of the NGR that the estimate was arrived at on a reasonable basis and is the best forecast or estimate possible in the circumstances;
- reduction of the UAFG rate by 2019 to 2.56 per cent. This revision is consistent with ATCO's assumptions about the effect that its UAFG related initiatives will have for the fourth access arrangement period. The revision is required to ensure compliance with rule 91 of the NGR; and
- reduction in throughput arising from the Authority's demand forecast adjustment. The revision is required to ensure internal consistency and compliance with rule 74 of the NGR.

314. The Authority has decided that $42.68 million of ATCO's forecast UAFG operating expenditure for the fourth access arrangement period satisfies rule 91 of the NGR. The Authority's capped forecast UAFG operating expenditure is based on:

- adjusted UAFG rate as per EMCa's recommendation;
- adjusted throughput forecast as per the Authority's demand forecast adjustment; and
- ATCO's updated wholesale gas price.

315. Table 15 shows ATCO's proposed UAFG operating expenditure forecast, and the Authority's approved UAFG operating expenditure forecast for the fourth access arrangement period. The table also shows the UAFG rates and total throughput assumptions that underpin both forecasts.

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122 ATCO Gas Australia, *Letter to ERA*, 30 July 2014.

123 Refer to the Demand Forecast chapter of this Draft Decision.

Table 15 ATCO's Proposed UAFG Operating Expenditure Forecast and Authority Approved UAFG Operating Expenditure Forecast (AA4)

	July to Dec 2014	2015	2016	2017	2018	2019	Total
ATCO Proposed							
UAFG Rate	2.67%	2.66%	2.66%	2.65%	2.62%	2.60%	
Total Throughput (TJ)	14,749	27,916	28,350	28,989	29,753	30,574	160,331
ATCO Proposed UAFG Operating Expenditure (real $ million at 30 June 2014)	**4.40**	**7.60**	**7.70**	**7.90**	**8.00**	**8.10**	**43.70**
Authority Approved							
UAFG Rate	2.62%	2.61%	2.59%	2.58%	2.57%	2.56%	
Total Throughput[124] (TJ)	14,749	27,872	28,263	28,730	29,299	29,917	158,830
Authority Approved UAFG Operating Expenditure (real $ million at 30 June 2014)	**4.62**	**7.44**	**7.49**	**7.63**	**7.72**	**7.79**	**42.68**

Source: ATCO Gas Australia Access Arrangement Information, ATCO Gas Australia Letter to the Authority 30 July 2014, EMCa Review of Technical Aspects of the Proposed Access Arrangement, ERA, GDS Tariff Model, October 2014.

Ancillary Service Operating Expenditure

316. ATCO has calculated forecast ancillary service revenues by multiplying forecast ancillary service volumes with proposed ancillary service tariffs. ATCO has forecast a decrease in ancillary service tariffs during the fourth access arrangement period as a result of competitive service tenders.[125] Ancillary service revenues are considered by ATCO to be equivalent to ancillary service operating expenditure, and ancillary service tariffs are calculated by ATCO on a cost per service per volume basis. The Authority has assumed that these services are externally sourced by ATCO. The Authority requires ATCO to confirm this and if these services are provided using internal resources, further justification on the efficiency of these costs.

317. ATCO's forecast ancillary service volumes are consistent with actual ancillary service volumes reported for the third access arrangement period.

[124] Authority approved total throughput has been calculated by applying the percentage adjustment of ATCO's demand forecast as approved by the Authority to ATCO's throughput forecast as per Table 22 of ATCO's Access Arrangement Information (AA4).

[125] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 280.

318. As per the Ancillary Service Tariff chapter of this Draft Decision, the Authority has adjusted ATCO's forecast ancillary service operating expenditure in line with the Authority adjusted B3 demand forecast.

319. Table 16 shows the Authority's approved ancillary service operating expenditure by year over the fourth access arrangement period.

Table 16 ATCO Proposed and Authority Approved Ancillary Service Operating Expenditure (AA4)

Revenue (Real $ millions at 30 June 2014)	July-Dec 2014[126]	2015	2016	2017	2018	2019	Total
ATCO Proposed							
Applying a meter lock	0.06	0.11	0.11	0.11	0.12	0.12	0.63
Removing a meter lock	0.02	0.04	0.04	0.04	0.04	0.04	0.22
Deregistering a delivery point	0.13	0.22	0.23	0.24	0.25	0.26	1.33
Disconnecting a delivery point	0.06	0.12	0.13	0.14	0.14	0.14	0.73
Reconnecting a delivery point	0.08	0.14	0.16	0.17	0.17	0.18	0.90
ATCO Proposed Ancillary Service Operating Expenditure (AA4)	0.32	0.63	0.68	0.70	0.72	0.74	3.78
Authority Approved							
Applying a meter lock	0.06	0.11	0.11	0.11	0.11	0.11	0.61
Removing a meter lock	0.02	0.04	0.04	0.04	0.04	0.04	0.22
Deregistering a delivery point	0.13	0.22	0.23	0.24	0.25	0.26	1.33
Disconnecting a delivery point	0.06	0.12	0.13	0.14	0.14	0.14	0.73
Reconnecting a delivery point	0.08	0.14	0.16	0.17	0.17	0.18	0.90
Authority Approved Ancillary Service Operating Expenditure (AA4)	0.32	0.62	0.67	0.69	0.71	0.73	3.75

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 96, p.281, ERA GDS Tariff Model, October 2014.

Required Amendments

320. The Authority considers that only $347.48 million of ATCO's forecast operating expenditure for the fourth access arrangement period satisfies rules 74 and 91 of the NGR:

- $163.65 million on network operating expenditure;
- $93.73 million on corporate operating expenditure;
- $43.67 million on IT operating expenditure;
- $42.68 million on UAFG operating expenditure; and
- $3.75 million on ancillary service operating expenditure.

[126] The revenue for each ancillary service for Jul-Dec 2014 is calculated by multiplying the charging parameter with part of the annual activity volume.

321. Table 17 summarises the Authority approved operating expenditure by category for the fourth access arrangement period.

Table 17 Authority Approved Operating Expenditure Forecast by Category (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Network Operating Expenditure	14.45	29.80	30.00	29.90	29.70	29.80	163.65
Corporate Operating Expenditure	8.46	16.67	16.56	16.59	17.68	17.78	93.73
IT Operating Expenditure	4.05	7.82	7.88	7.91	7.98	8.02	43.67
UAFG Operating Expenditure	4.62	7.44	7.49	7.63	7.72	7.79	42.68
Ancillary Service Operating Expenditure	0.32	0.62	0.67	0.69	0.71	0.73	3.75
Authority Approved Operating Expenditure	**31.91**	**62.35**	**62.59**	**62.72**	**63.79**	**64.12**	**347.48**

Source: ATCO Gas Australia, Access Arrangement Information, March 2014. EMCa, Review of Technical Aspects of the Proposed Access Arrangement, June 2014. ERA, GDS Tariff Model, October 2014.

Required Amendment 5.

The Authority requires ATCO to amend its forecast operating expenditure for the fourth access arrangement period ($347.48 million in real dollars million at 30 June 2014) in line with Table 17 of this Draft Decision.

Opening Capital Base

Regulatory Requirements

322. The capital base is the capital value attributed to the pipeline assets that are used to provide covered services. The capital base is used to calculate the return on capital and an amount of depreciation (return of capital).

323. Relevantly rule 77(2) of the NGR establishes the approach to determine the opening capital base for an access arrangement period that follows immediately on the conclusion of a preceding access arrangement period.

324. The Authority notes that the AEMC published an updated version of the NGR on 2 October 2014, which added additional text to rule 77(2)(a). This rule change does not affect ATCO's proposed revised access arrangement as ATCO has provided actual capital expenditure for the second access arrangement period.

325. Rule 77(2) of the NGR states:

77. Opening capital base

...

2) If an access arrangement period follows immediately on the conclusion of a preceding access arrangement period, the opening capital base for the later access arrangement period is to be:

a) the opening capital base as at the commencement of the earlier access arrangement period adjusted for any difference between estimated and actual capital expenditure included in that opening capital base. This adjustment must also remove any benefit or penalty associated with any difference between the estimated and actual capital expenditure;

plus:

b) conforming capital expenditure made, or to be made, during the earlier access arrangement period;

plus:

c) any amounts to be added to the capital base under rule 82 [capital contributions by users to new capital expenditure], rule 84 [speculative capital expenditure account] or rule 86 [re-use of redundant assets];

less:

d) depreciation over the earlier access arrangement period (to be calculated in accordance with any relevant provisions of the access arrangement governing the calculation of depreciation for the purpose of establishing the opening capital base); and

e) redundant assets identified during the course of the earlier access arrangement period; and

f) the value of pipeline assets disposed of during the earlier access arrangement period.

326. Rule 79 of the NGR sets out the criteria for new capital expenditure. Rule 79 of the NGR states:

79. New capital expenditure criteria

1) Conforming capital expenditure is capital expenditure that conforms with the following criteria:

a) the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services;

b) the capital expenditure must be justifiable having regard to one of the following grounds stated in rule 79(2).

2) Capital expenditure is justifiable if:

a) the overall economic value of the expenditure is positive; or

b) the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or

c) the capital expenditure is necessary:

(i) to maintain and improve the safety of services; or

(ii) to maintain the integrity of services; or

(iii) to comply with a regulatory obligation or requirement; or

(iv) to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred

(as distinct from projected demand that is dependent on an expansion of pipeline capacity); or

d) the capital expenditure is an aggregate amount divisible into 2 parts, one referable to incremental services and the other referable to a purpose referred to in paragraph (c), and the former is justifiable under paragraph (b) and the latter under paragraph (c).

3) In deciding whether the overall economic value of capital expenditure is positive, consideration is to be given only to economic value directly accruing to the service provider, gas producers, users and end users.

4) In determining the present value of expected incremental revenue:

a) a tariff will be assumed for incremental services based on (or extrapolated from) prevailing reference tariffs or an estimate of the reference tariffs that would have been set for comparable services if those services had been reference services;

b) incremental revenue will be taken to be the gross revenue to be derived from the incremental services less incremental operating expenditure for the incremental services; and

c) a discount rate is to be used equal to the rate of return implicit in the reference tariff.

5) If capital expenditure made during an access arrangement period conforms, in part, with the criteria laid down in this rule, the capital expenditure is, to that extent, to be regarded as conforming capital expenditure.

6) The [Authority's] discretion under this rule is limited.

327. Rule 82(1) of the NGR provides that a user may make a capital contribution towards a service provider's capital expenditure. Any capital contributions by a user may, with the approval of the Authority, be rolled into the capital base for a pipeline on condition that the service provider does not benefit through increased revenue from the user's contribution to the capital base.[127]

328. Rules 88, 89 and 90 of the NGR specify particular requirements for the depreciation of pipeline assets in the Regulatory Asset Base (**RAB**).

329. Rule 88(2) of the NGR states that the depreciation schedule may consist of a number of separate schedules, each relating to a particular asset or asset class.

330. Rule 89(1) of the NGR states that the depreciation schedule should be designed so that:

- reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services;
- so that each asset or group of assets (asset class) is depreciated over the economic life of that asset or group of assets (asset class);
- so as to allow, as far as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset or a particular group of assets (asset class) can be adjusted;
- so that (subject to the rules about capital redundancy in rule 85 of the NGR), an asset is depreciated only once (i.e. the amount by which the asset is depreciated over its economic life does not exceed the value of the asset at the time of its

[127] Rule 82(3) of the NGR.

inclusion in the capital base (adjusted, if the accounting method approved by the Authority permits, for inflation)); and

- so as to allow the service provider's reasonable needs for cash flow to meet financing, non-capital and other costs.

331. Rule 90(1) of the NGR specifies that a full access arrangement must contain provisions governing the calculation of depreciation for establishing the opening capital base for the next access arrangement period. Rule 91(2) of the NGR states that those provisions must resolve whether depreciation of the capital base is to be based on forecast or actual capital expenditure.

332. Pursuant to rule 71(2) of the NGR, the Authority must consider and give appropriate weight to submissions and comments received on the question of whether a relevant access arrangement proposal should be approved.

ATCO's Proposed Changes

333. ATCO has proposed an opening capital base for the fourth access arrangement period of $1,020.05 million as at 1 July 2014.[128] ATCO's proposed opening capital base includes $273.87 million of proposed conforming capital expenditure for the third access arrangement period, less proposed depreciation of $133.51 million.[129]

334. ATCO's proposed conforming capital expenditure for the third access arrangement period includes $3.32 million for acquiring WestNet Energy assets in 2010.[130] ATCO has presented the acquisition of WestNet Energy assets separately in its proposed revised access arrangement.

335. ATCO has calculated the capital base using a roll-forward method. On 24 October 2012, the Australian Bureau of Statistics (**ABS**) published a rebasing of the Headline CPI "Weighted Average of Eight Capital Cities: All-Groups Index" to 100 for the financial year 2011/12. ATCO has used the ABS's rebased CPI series to escalate its opening capital base from December 2009 dollars to June 2014 dollars.[131]

336. ATCO's proposed values for the capital base at the commencement of the fourth access arrangement period are shown in Table 18.

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128 All values are in real $ million at 30 June 2014.

129 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, section 9.1, p. 206.

130 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, section 7.8, p. 158.

131 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, section 9.3, p. 207.

Table 18 ATCO Proposed Opening Capital Base at 1 July 2014

Real $ million at 30 June 2014	Jan to June 2010	2010/ 2011	2011/2012	2012/2013	2013/2014
Opening Capital Base AA3	879.71	898.52	913.52	923.32	971.60
Plus: Capital Expenditure	31.14	41.69	38.91	79.72	82.40
Less: Depreciation	12.32	26.70	29.12	31.45	33.92
Closing Capital Base AA3	898.52	913.52	923.32	971.60	1,020.05
Opening Capital Base for AA4 at 1 July 2014					**1,020.05**

Source: ATCO Gas Australia, Access Arrangement Information, March 2014, Table 74, p. 209. ATCO Gas Australia Tariff Model, September 2014.

337. Table 19 breaks down ATCO's proposed conforming capital expenditure for the third access arrangement period by asset class.

Table 19 ATCO Proposed Conforming Capital Expenditure by Asset Class (AA3) [132]

Real $ million at 30 June 2014	Jan to June 2010	2010/2011	2011/2012	2012/2013	2013/2014	Total
High Pressure Mains	8.88	3.61	2.92	20.76	6.16	42.33
Medium / Low Pressure Mains	5.17	10.39	11.31	22.80	19.71	69.39
Regulators	0.28	0.24	0.46	1.24	1.43	3.66
Secondary Gate Stations	1.87	0.19	0.25	0.00	0.00	2.31
Buildings	0.13	1.19	0.79	4.45	11.20	17.76
Meter and Services Pipes	9.58	20.91	18.66	20.99	29.79	99.91
Equipment & Vehicles	3.19	0.80	1.22	4.21	9.49	18.92
Information Technology	2.03	4.36	3.30	5.27	4.62	19.58
ATCO Proposed Conforming Capital Expenditure	**31.13**	**41.70**	**38.91**	**79.73**	**82.40**	**273.87**

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 23, p. 121. ATCO Gas Australia Tariff Model, September 2014.

338. ATCO considers that its proposed conforming capital expenditure for the third access arrangement period is consistent with rule 79 of the NGR. ATCO states that it has managed its network in accordance with good industry practice, incurred expenditure on a prudent basis, and used efficient procurement practices to achieve the lowest sustainable cost of providing services.[133] ATCO considers that growth related capital

[132] Buildings, Equipment & Vehicles and Information Technology include capital expenditure on WestNet assets.

[133] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, section 73, p. 119.

expenditure satisfies the incremental revenue test (in rule 79(2)(b) of the NGR) and that the remaining capital expenditure satisfies at least one of the criteria in rule 79(2)(c) of the NGR.[134]

339. In order to demonstrate how its proposed conforming capital expenditure for the third access arrangement period meets the requirements of the NGR, ATCO has broken down the expenditure by the following cost drivers:[135]

- Sustaining capital expenditure;
- Growth capital expenditure;
- Structures and equipment capital expenditure; and
- Information Technology capital expenditure (**IT**).

340. ATCO submits that the variance between the Authority approved capital expenditure forecast for the third access arrangement period and ATCO's proposed conforming capital expenditure has resulted from:[136]

- Increase in sustaining capital expenditure with ATCO's implementation of the Safety Case in January 2013, on medium/low pressure mains.
- Reduction in growth capital expenditure with ATCO's deferral of expenditure on high pressure mains extension and lower expenditure on meters and service pipes due to lower than forecast connection numbers.
- Increase in structures and equipment capital expenditure on buildings and vehicles with ATCO's implementation of a built-for-purpose and ownership strategy on the basis of cost efficiency.

341. Table 20 shows ATCO's proposed conforming capital expenditure and the Authority's approved forecast capital expenditure for the third access arrangement period by cost driver.

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134 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, section 7.1, p. 118.

135 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 127.

136 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, section 7.3, p. 121.

Table 20 ATCO Proposed Conforming Capital Expenditure and Authority Approved Forecast Capital Expenditure by Cost Driver (AA3)

Real $ million at 30 June 2014	Jan to June 2010	2010/ 2011	2011/ 2012	2012/ 2013	2013/ 2014	ATCO Proposed Conforming Capital Expenditure (A)	Approved Forecast by cost driver (B)	Difference (A-B)
Sustaining	11.62	9.51	9.56	28.31	22.16	81.16	51.9	29.26
Growth	14.15	25.84	24.04	37.49	35.05	136.57	190.3	(53.73)
Structures and equipment	0.12	1.99	2.01	8.66	20.69	33.47	1.4	32.07
IT	1.91	4.36	3.30	5.27	4.50	19.35	17.8	1.55
WestNet Energy assets	3.32	0.00	0.00	0.00	0.00	3.32	4.6	(1.28)
Total[137]	**31.13**	**41.70**	**38.91**	**79.73**	**82.40**	**273.87**	**265.98**	**7.89**

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 26, p. 129. ATCO Gas Australia Tariff Model, September 2014.

342. ATCO states that its proposed depreciation of $133.51 million is consistent with its forecast depreciation for the third access arrangement period.[138]

Submissions

343. Alinta's submission has stated that ATCO's conforming capital expenditure for the third access arrangement period is greater than the Authority's approved forecast. Alinta considers that the Authority should scrutinise ATCO's proposal to determine whether it can be justified in accordance with rule 97(1) of the NGR.[139]

344. Alinta notes that the NGR allows the Authority to reference past capital expenditure against a range of criteria such as efficiency, good industry practice and sustainable cost, and urges the Authority to consider all of ATCO's past capital expenditure against the relevant criteria in the NGR.[140]

345. Kleenheat's submission has stated that ATCO's proposed conforming capital expenditure indicates under investment in prior access arrangement periods.[141] Whilst Kleenheat acknowledges the need for increased capital expenditure for IT, safety and network growth, Kleenheat has concerns over the magnitude of the expenditure relative to the existing capital base.[142]

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137 Total includes capital expenditure on Westnet assets in 2010.

138 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, section 9.1, p. 206.

139 Alinta Energy, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014, p. 2.

140 Alinta Energy, Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement, 21 May 2014, p. 6.

141 Kleenheat Gas, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014, p. 2.

142 Kleenheat Gas, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014, p. 2.

Considerations of the Authority

346. The Authority has considered whether ATCO's proposed opening capital base for the fourth access arrangement period meets the requirements of rules 77 and 79 of the NGR. These considerations have included:

- verification of capital expenditure;
- determination of the opening capital base for the fourth access arrangement period, taking into account an assessment of:
  - conforming capital expenditure in the third access arrangement period;
  - capital contributions;
  - depreciation; and
- assessment of ATCO's general method of calculating the capital base.

Verification of Capital Expenditure

347. In order for the Authority to review ATCO's access arrangement proposal ATCO was requested to provide financial information in relation to its current access proposal.[143]

348. On 16 July 2014, ATCO provided the Authority with copies of the statutory accounts for the year ending 30 June 2011, the six months ending 31 December 2011, 31 December 2012 and 31 December 2013.

349. On 7 August 2014, ATCO provided the Authority with regulatory financial accounts for the year ending 30 June 2011, the six months ending 31 December 2011, and the years ending 31 December 2012 and 31 December 2013.

350. On 8 August 2014, ATCO provided the Authority with its Cost Allocation Method 2014 (**CAM**) document which explains the methods ATCO uses to classify expenditure as:

- relating to regulated or unregulated networks;
- relating to reference or non-reference services;
- reclassifying capital contributions on a deferred revenue basis to a cash basis;
- reclassifying accounting revenue treated as capital contributions according to regulatory definitions; and
- excluded capital expenditure which is recovered via user specific charges.

351. ATCO engaged PricewaterhouseCoopers (**PWC**) to conduct a non-statutory review of the financial information relating to the schedule of regulatory revenue, operating expenditure and capital expenditure for the regulatory financial accounts provided to the Authority.

352. PWC stated that based on its review, nothing came to its attention that caused it to believe that the regulatory accounts are not prepared, in all material respects, in accordance with the accounting policies described in the CAM.

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[143] Economic Regulation Authority, *Information request letter to ATCO Gas Australia*, 21 February 2014.

353. The Authority notes that PWC carried out a review, which is substantially less in scope than an audit and consequently PWC does not provide assurance that they were aware of all significant matters that might be identified in an audit.

354. The Authority has undertaken its own review, analysing the statutory accounts and associated adjustments made to these accounts to obtain the regulatory accounts. These adjustments have been reviewed to ensure they are in accordance with the methodology set out in the CAM.

355. In conducting this review, the Authority has made several requests to ATCO for further breakdowns of costs and a more detailed explanation of how the CAM is applied in practice. These requests were aimed at gaining a better understanding of direct and indirect costs and how costs were allocated to non-regulated network areas such as Albany and Kalgoorlie.

356. With regard to the capital expenditure the Authority notes that ATCO has deducted a flat 2 per cent from IT capital expenditure and Property, Plant and Equipment capital expenditure that cannot be directly allocated to a cost centre, to account for non-regulated and non-reference services.

357. The CAM does not provide any explanation on how indirect capital expenditure should be apportioned between the regulated network and reference services and the non-regulated network and non-reference services.

358. ATCO has advised the Authority that the flat 2 per cent deduction has been adopted as it has been used historically to reflect the different mix of capital costs relating to these services.[144]

359. The Authority is not satisfied with this justification and requires ATCO to review this calculation and provide an updated formula for allocating capital expenditure that relates to a number of costs centres between regulated and non-regulated sections of the network.

360. Unless ATCO provide a reasonable justification for the allocation of indirect capital expenditure to non-regulated and non-reference services the Authority cannot be satisfied that the regulated accounts are free of material misstatements or that the accounts have been prepared in accordance with the CAM.

361. The Authority has accepted ATCO's allocation method based on ATCO providing further justification in response to this Draft Decision on how the 2 per cent deduction was calculated.

Assessment of Capital Expenditure

362. At an aggregate level, ATCO's proposal to add $273.87 million for conforming capital expenditure is $7.89 million or 2.87 per cent more than the forecast amount approved by the Authority for the third access arrangement period.[145] Once ATCO's proposed capital expenditure is analysed at a disaggregate level, it is clear that some significant deviations occur across a number of asset classes.

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[144] ATCO Gas Australia, *Email response to ERA information request of 12 September 2014*, 17 September 2014.

[145] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014.

363. Table 21 breaks down the Authority approved forecast capital expenditure for the third access arrangement period and ATCO's proposed conforming capital expenditure by asset class.

Table 21 ATCO Proposed Conforming Capital Expenditure and Authority Approved Forecast Capital Expenditure by Asset Class (AA3)

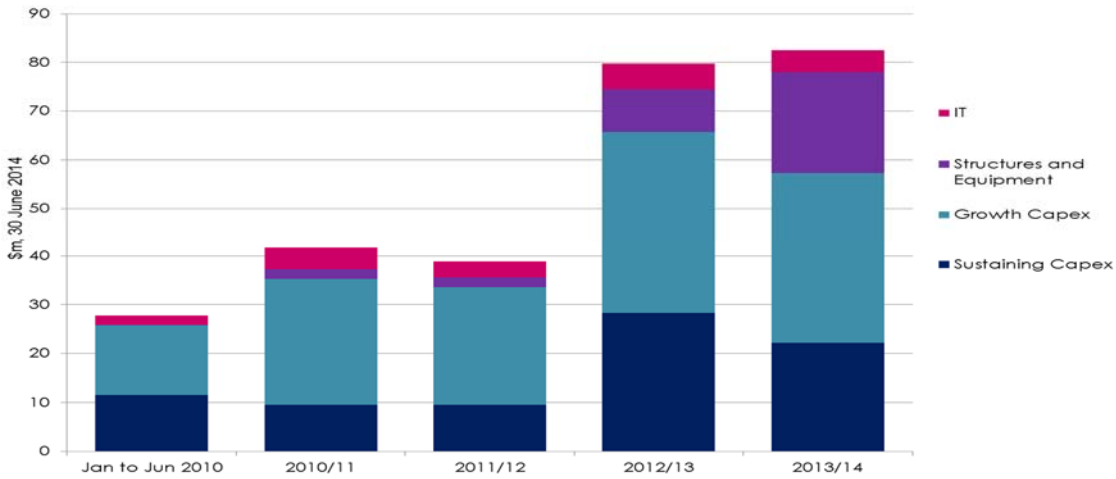
Real $ million at 30 June 2014	ATCO Proposed Conforming Capital Expenditure (A)	Authority Approved Forecast Capital Expenditure (B)	Difference (A-B)
High Pressure Mains	42.33	46.92	(4.59)
Medium / Low Pressure Mains	69.39	60.54	8.85
Regulators	3.66	1.83	1.83
Secondary Gate Stations	2.31	2.73	(0.42)
Buildings[146]	17.76	10.36	7.40
Meter and Services Pipes	99.91	117.62	(17.71)
Equipment & Vehicles	18.92	5.87	13.05
Information Technology	19.58	20.11	(0.53)
Total	**273.87**	**265.98**	**7.89**

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 23, p. 121, ATCO Gas Australia Tariff Model, September 2014.

364. Figure 20 shows that most of ATCO's proposed conforming capital expenditure for the third access arrangement period occurred in 2012/2013 and 2013/2014, subsequent to ATCO acquiring the network.

146 Buildings, Equipment & Vehicles and Information Technology include capital expenditure on WestNet assets.

Figure 20 ATCO's Proposed Conforming Capital Expenditure by Cost Category (AA3)



Source: EMCa, Review of Technical Aspects of the Proposed Access Arrangement, June 2014, Figure 15, p. 57.

365. With assistance from EMCa, the Authority has assessed whether ATCO's actual capital expenditure for the third access arrangement period that is proposed to be rolled into the capital base is conforming capital expenditure in accordance with the NGR using a three-step framework:[147]

- evaluate whether the expenditure is justifiable on the grounds set out in rule 79(2) of the NGR;
- consider whether the expenditure satisfies the prudent service provider test set out in rule 79(1)(a) of the NGR; and
- assess whether forecasts or estimates comply with rule 74(2) of the NGR.

366. EMCa has also reviewed ATCO's governance framework and processes in relation to capital expenditure. EMCa's review has focused on ATCO's policies, processes, procedures and reference documents that relate to project and program development, approval and delivery. EMCa conducted the review in relation to ATCO's corporate objectives and regulatory obligations, in addition to good industry practice. EMCa considers that ATCO has an adequate governance framework for actual capital expenditure.

367. The Authority's has assessed ATCO's proposed conforming capital expenditure for the third access arrangement period based on the following cost drivers:

- Sustaining capital expenditure;
- Growth capital expenditure;
- Structures and equipment capital expenditure; and
- Information Technology (**IT**) capital expenditure.

[147] EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, 6 June 2014, pp. 17-19.

Sustaining Capital Expenditure

368. ATCO has spent $81.16 million on sustaining capital expenditure during the third access arrangement period:

- $57.32 million on asset replacement;[148] and
- $23.84 million on asset performance and safety.[149]

369. ATCO's proposed sustaining capital expenditure for the third access arrangement period is $29.26 million higher than the forecast approved by the Authority for the third access arrangement period.[150] ATCO has attributed this increase to its Safety Case, which was accepted by Energy*Safety* following the Authority's third access arrangement period final decision.

370. With the exception of the Mandurah Gas Lateral, ATCO has sought to justify all of the sustaining capital expenditure under one or more of the grounds in rule 79(2)(c) of the NGR. ATCO has provided a variance analysis of the capital projects undertaken in the third access arrangement period (where the variation is more than 5 per cent). ATCO also provided one project review, four business cases and four capital expenditure appropriation requests for sustaining capital expenditure projects.

371. EMCa has assessed five projects that make up 90 per cent of the additional sustaining capital expenditure compared to forecast expenditure, in addition to the Mandurah Gas Lateral project.[151] EMCa's assessment has considered the following:

- Asset Management Plan (AMP);
- Australian standards AS/NZS4645 (Gas Distribution Network Management) and AS2885 (Australian Pipeline Standard);
- Safety Case, which was accepted by Energy*Safety*;
- Formal Safety Assessments (FSA);
- business cases;
- rationale provided by ATCO for each project; and
- practices of other gas distribution pipelines.

372. On EMCa's recommendation, the Authority is satisfied that the additional five projects and the Mandurah Gas Lateral project are justifiable under one or more of the grounds under rule 79(2) of the NGR.

373. EMCa has also reviewed the other sustaining capital expenditure projects with regard to ATCO's rationale for carrying out the projects, governance arrangements and delivery performance. EMCa is of the view that these other projects can be justified under one or more of the grounds in rule 79(2)(c), and that ATCO's expenditure on these projects satisfies rule 79(1)(a) of the NGR.

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148 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 40, p 143.

149 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 44, p 147.

150 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 41 pp. 144–147.

151 EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, 6 June 2014, pp. 69-71.

374. The Authority has considered EMCa's recommendations and ATCO's proposal and has decided that ATCO's sustaining capital expenditure of $81.16 million for the third access arrangement period is conforming under rule 79 of the NGR.

Growth Capital Expenditure

375. ATCO has spent $136.57 million on growth capital expenditure during the third access arrangement period:

- $107.37 million on customer initiated;[152] and
- $29.21 million on demand.[153]

376. ATCO's proposed growth capital expenditure for the third access arrangement period is $53.73 million[154] lower than the forecast approved by the Authority for the third access arrangement period. ATCO has attributed the decreased expenditure to poor economic conditions affecting new housing developments.[155]

377. ATCO has stated that its growth capital expenditure during the third access arrangement period is justified under rule 79(2) of the NGR. ATCO has also presented a Net Present Value (**NPV**) analysis that is based on the incremental revenue test (in rule 79(2)(b) of the NGR).

378. EMCa has reviewed ATCO's NPV analysis, and has carried out a sensitivity test on its tariff and volume assumptions. EMCa is satisfied that the $136.57 million spent by ATCO can be considered conforming capital expenditure for the purposes of rules 79 and 77(2) of the NGR.[156]

379. The Authority is satisfied that EMCa has correctly assessed ATCO's incremental revenue test. Therefore, the Authority has accepted EMCa's advice that the growth expenditure that ATCO has incurred should be accepted as meeting the test prescribed in rule 79(2)(b).[157]

380. As a result, the Authority has decided that ATCO's growth capital expenditure of $136.57 million for the third access arrangement period is conforming under rule 79 of the NGR.

Structures and Equipment Capital Expenditure

381. ATCO has spent $33.47 million on structures and equipment capital expenditure during the third access arrangement period:[158]

- $14 million on Jandakot operational centre;
- $1.10 million on Mardella depot;

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152 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 32, p. 133.

153 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 35, p. 135.

154 EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, p. 73.

155 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Section 7.6, pp. 129-143. However, for the fourth access arrangement period, ATCO states that the new housing connections are forecast to recover to pre-GFC levels (Access Arrangement Information, 17 March 2014, p. 182).

156 EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 74-78.

157 EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 74-77.

158 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 49, p. 150.

- $0.80 million on Jandakot blue flame kitchen;
- $0.70 million on Jandakot sewerage extension;
- $0.70 million on a new Jandakot warehouse redevelopment;
- $0.10 million on Wangara depot upgrade; and
- $16.10 million on fleet and equipment.

382. ATCO's proposed structures and equipment capital expenditure for the third access arrangement period is $32.07 million higher than the forecast approved by the Authority for the third access arrangement period. ATCO has attributed the increased expenditure to ATCO's change in strategy towards depot and fleet ownership rather than leasing.[159]

383. ATCO has demonstrated how it says that its structures and equipment capital expenditure during the third access arrangement period is justified under rules 79(1)(a) and 79(2) of the NGR in Table 49 of its Access Arrangement Information.[160]

384. EMCa's assessment of structures and equipment capital expenditure has focused on the increased expenditure, which includes expenditure on Jandakot operational centre, Mardella and Wangara depots, in addition to fleet and equipment.[161] EMCa's review has concluded that $1.5 million of ATCO's proposed structures and equipment capital expenditure does not satisfy rule 79 of the NGR:

- $0.80 million for Jandakot blue flame kitchen: ATCO has positioned the project as a marketing vehicle. EMCa has recommended that ATCO's increased business development and marketing program does not satisfy the economic value or incremental revenue tests, and that the project's link to safety is weak.
- $0.70 million for Jandakot sewerage extension: EMCa has found that this project appears to have been double counted, as sewerage costs also appear in the Jandakot Redevelopment Project Business Case.

385. The Authority has decided that $31.97 million out of ATCO's proposed structures and equipment capital expenditure of $33.47 million is conforming under rule 79 of the NGR. The Authority concurs with EMCa's recommendations that the Jandakot blue flame kitchen and the Jandakot sewage extension are not conforming capital expenditure under rule 79 of the NGR.

IT Capital Expenditure

386. ATCO has proposed IT capital expenditure of $19.50 million for the third access arrangement period.[162] In its proposed revised access arrangement, ATCO states that it has spent $19.35 million on IT capital expenditure during the third access

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159 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Section 7.7.3, pp. 149-153.

160 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 151.

161 EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 80-83.

162 ATCO Gas Australia, *Email response to EMCa84*, 9 May 2014.
ATCO Gas Australia, *Email response to EMCa88*, 4 June 2014.

arrangement period.[163] ATCO has provided a breakdown of $18.20 million of IT capital expenditure.[164]

387. ATCO has attributed the variance of $1.30 million from $18.20 million to $19.50 million to structures and equipment IT ($0.90 million), miscellaneous IT ($0.20 million), network telemetry ($0.10 million) and rounding error ($0.10 million).[165]

388. ATCO has sought to justify most of its IT capital expenditure during the third access arrangement period under rule 79(2)(c) of the NGR. ATCO also considers that its IT capital expenditure satisfies the prudent service provider test in rule 79(1)(a) of the NGR.[166]

389. ATCO has not provided any evidence to justify the variance between the two IT capital expenditure figures of $18.20 million and $19.50 million. In the absence of such evidence, the Authority cannot approve the $1.30 million as conforming capital expenditure.

390. EMCa has reviewed ATCO's IT capital expenditure at a disaggregate level, and has focused on the variance in IT capital expenditure between the Authority approved forecast for the third access arrangement period and nine additional projects that were not identified during the third access arrangement period revision process.[167]

391. EMCa could not reconcile ATCO's over expenditure on phase 1 of the Field Mobility project. The information that ATCO provided with the proposed revised access arrangement (access arrangement information and IT asset management plan) has been inconsistent with ATCO's responses to information requests from EMCa.[168] ATCO has not provided evidence for the additional $2.34 million expenditure for the Geographical Information Systems (**GIS**) project and the $1.20 million for the Network Data Visualisation (**NDV**) project. EMCa's assessment has concluded that $7.11 million of ATCO's IT capital expenditure on the Field Mobility project, the GIS upgrade project, and the NDV project does not satisfy rule 77(2) of the NGR.

392. The Authority has reviewed EMCa's recommendations and the information that has been provided by ATCO in relation to its proposed conforming IT capital expenditure for the third access arrangement period. The Authority has decided that $11.09 million of ATCO's proposed IT capital expenditure for the third access arrangement period is conforming in accordance with rules 77(2) and 79(1)(a) of the NGR. The $8.41 million reduction consists of $7.11 million referred to in the previous paragraph, and $1.30 million for the variance between $18.20 million and $19.50 million.

393. As mentioned in the operating expenditure section of this Draft Decision, the Authority has also decided that a ten per cent annual efficiency dividend should be applied to the Authority's approved forecast operating expenditure for the fourth access arrangement period to account for productivity improvements that are expected to flow from the conforming IT capital expenditure during the third access arrangement period.

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163 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Tables 23 and 24, pp. 121-122.

164 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Section 7.7.4, pp. 153-158.

165 ATCO Gas Australia, *Email response to EMCa88*, 9 May 2014.

166 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, section 7.4 p. 122.

167 EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 85-92.

168 ATCO Gas Australia, *Attachments to email response to EMCa13*, 7 April 2014.

WestNet Energy Assets

394. ATCO has proposed to add $3.32 million to its proposed conforming capital for the third access arrangement period, to account for the purchase of WestNet Energy assets. Table 22 breaks down ATCO's proposed WestNet Energy asset conforming capital expenditure by asset class.

Table 22 ATCO Proposed WestNet Energy Asset Conforming Capital Expenditure by Asset Class (AA3)

Real $ million at 30 June 2014	Jan to Jun 2010	2010/11	2011/12	2012/13	2013/14	ATCO Proposed AA3
Buildings	0.01	-	-	-	-	0.01
Equipment & Vehicles	3.19	-	-	-	-	3.19
Information Technology	0.12	-	-	-	-	0.12
ATCO Proposed WestNet Energy Asset Conforming Capital Expenditure	**3.32**	-	-	-	-	**3.32**

Source: ATCO Gas Australia, Tariff Model, September 2014.

395. In the third access arrangement final decision, the Authority considered that the acquisition of assets from WestNet was expected to meet the criteria for conforming capital expenditure set out in rule 79(2) of the NGR. The Authority included an estimate of $4.60 million for the acquisition of WestNet Energy assets in its approved forecast capital expenditure for the third access arrangement period.

396. ATCO has stated that the actual acquisition costs of WestNet Energy assets were less than the $4.60 million forecast. This has been due to the deferral of vehicle purchases. The Authority approves that $3.32 million for the purchase of WestNet Energy assets is conforming capital expenditure for the third access arrangement period.

Consumer Price Index adjustment

397. On 24 October 2012, the Australian Bureau of Statistics (**ABS**) published a rebasing of the Headline CPI "Weighted Average of Eight Capital Cities: All-Groups Index" to 100 for the financial year 2011/12.

398. ATCO used the latest ABS published CPI to escalate or de-escalate the dollar amount from real to nominal or vice versa in the periods prior to 2012.[169]

399. The Authority considers that ATCO's approach does not maintain the historical values as the rebased CPI leads to rounding errors. The ABS has acknowledged that the rebasing will lead to rounding errors in the revised CPI.[170] The Authority is not satisfied that the method used by ATCO is the best estimate. The Authority considers that ATCO's method is thus not consistent with rule 74 of the NGR.

400. The Authority has assessed the best approach to escalate the capital base in line with ABS's CPI rebasing. The Authority considers that the best approach to escalate the capital base is as follows:

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169 ATCO Gas Australia, *Tariff Model*, September 2014.

170 ABS, *64010*, P.2 September 2012.

- use the old ABS CPI series to escalate the capital base up to June 2012 when the ABS rebased the CPI to 100; and
- use the new ABS CPI series after June 2012.

401. The Authority has decided to adopt this approach when escalating the capital base. As a result this further reduces capital expenditure by $0.36 million.

Required Amendments

402. The Authority does not approve ATCO's proposed capital expenditure for the third access arrangement period as submitted.

403. The Authority has decided that:

- $263.60 million (96 per cent of ATCO's expenditure) complies with the criteria set out in rule 79 of the NGR and can therefore be included in the opening value of the asset base for the fourth access arrangement period; and
- $9.91 million (4 per cent of ATCO's expenditure) does not comply with the criteria set out in rule 79 of the NGR and should not be included in the opening value of the asset base for the fourth access arrangement period.
- $0.36 million is not consistent with rule 74 of the NGR and should not be included in the opening value of the asset base for the fourth access arrangement period.

404. The Authority has decided that $263.60 million of ATCO's capital expenditure in the third access arrangement period is conforming:

- $81.16 million on sustaining capital expenditure;
- $136.58 million on growth capital expenditure;
- $31.97 million on structures and equipment capital expenditure;
- $10.94 million on IT capital expenditure;
- $3.32 million on WestNet energy assets; and
- ($0.36) million for CPI adjustment.

405. The Authority has escalated its approved conforming capital expenditure using the approach, mentioned in paragraph 401. Table 23 shows the Authority's approved conforming capital expenditure for the third access arrangement period.

Table 23 Authority Approved Conforming Capital Expenditure by Project (AA3)

Real $ million at 30 June 2014	Jan to June 2010	2010/11	2011/12	2012/13	2013/14	Total
ATCO Proposed Conforming Capital Expenditure	31.12	41.70	38.91	79.73	82.40	273.87
Blue Flame Kitchen					(0.80)	(0.80)
Jandakot Sewerage Extension				(0.70)		(0.70)
IT – Field Mobility reduction			(2.57)	(1.00)		(3.57)
IT – GIS reduction				(2.34)		(2.34)
IT – NDV reduction					(1.20)	(1.20)
IT - Variance		(0.30)	(0.20)	(0.20)	(0.60)	(1.30)
Total proposed reductions	-	(0.30)	(2.77)	(4.24)	(2.60)	(9.91)
Authority Required Conforming Capital Expenditure	**31.12**	**41.40**	**36.14**	**75.49**	**79.80**	**263.96**
CPI Adjustment	(0.03)	(0.10)	(0.07)	(0.15)	(0.00)	(0.36)
Authority Required Conforming Capital Expenditure	**31.09**	**41.30**	**36.07**	**75.34**	**79.80**	**263.60**

Source: ERA, GDS Tariff Model, October 2014.

406. Table 24 breaks down the Authority's approved conforming capital expenditure for the third access arrangement period by asset class.

Table 24 Authority Approved Conforming Capital Expenditure by Asset Class (AA3)

Real $ million at 30 June 2014	Jan to Jun 2010	2010/11	2011/12	2012/13	2013/14	Total
High Pressure Mains - steel & PE	8.86	3.60	2.91	20.72	6.16	42.26
Medium / Low Pressure Mains	5.16	10.37	11.29	22.76	19.71	69.28
Regulators	0.28	0.24	0.46	1.24	1.43	3.65
Secondary Gate Stations	1.87	0.19	0.25	0.00	0.00	2.31
Buildings	0.13	1.19	0.79	3.74	10.40	16.25
Meter and Services Pipes	9.56	20.86	18.62	20.95	29.79	99.79
Equipment & Vehicles	3.20	0.80	1.22	4.20	9.49	18.91
Information Technology	2.03	4.05	0.53	1.73	2.82	11.15
Authority Required Conforming Capital Expenditure	**31.09**	**41.30**	**36.07**	**75.34**	**79.80**	**263.60**

Source: ERA, GDS Tariff Model, October 2014.

Assessment of Capital Contributions

407. ATCO has advised that it received $12.21 million in capital contributions during the third access arrangement period.[171] ATCO stated that these contributions have been deducted from the appropriate proposed conforming capital expenditure items for the purpose of determining the opening capital base for the fourth access arrangement period.

408. The Authority has reviewed financial information provided by ATCO, and has found that ATCO's capital expenditure for the current access arrangement period does not include any capital contributions by users. Therefore, the Authority is satisfied that ATCO has not rolled capital contributions into the opening capital base for the fourth access arrangement period. As ATCO does not seek approval to roll in any user contributions, it is not necessary for the Authority to consider the application of ATCO's proposal in respect of rule 81 and rule 82 of the NGR.

Assessment of Depreciation

409. ATCO has proposed to include depreciation of $133.51 million in the opening capital base for the fourth access arrangement period.[172]

410. The Authority notes that its discretion in relation to depreciation over the current access arrangement period is limited under rule 89(3) of the NGR. However, the Authority has to consider whether ATCO's approach in calculating the roll-forward of the capital base yields values that are equivalent in real terms to the values of depreciation allowances applied in the determination of reference tariffs for the third access arrangement period.

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171 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Section 7.9, p. 159.

172 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 73, p. 208.

411. The Authority is not satisfied that the method used by ATCO to escalate the capital base in line with ABS's CPI rebasing is consistent with the NGR. The Authority's considerations are discussed previously in paragraphs 397 to 401 in the CPI adjustment section.

412. The Authority has decided to approve a depreciation amount of $133.05 million to be included in the opening capital base for the fourth access arrangement period. Table 25 breaks down the Authority approved depreciation to be included in the opening capital base for the fourth access arrangement period by year.

Table 25 Authority Approved Depreciation of Opening Capital Base (AA3)

Real $ million at 30 June 2014	Jan to Jun 2010	2010/11	2011/12	2012/13	2013/14	Total
ATCO proposed Depreciation of Opening Capital Base	**12.32**	**26.70**	**29.12**	**31.45**	**33.92**	**133.51**
CPI Adjustment	(0.03)	(0.07)	(0.08)	(0.06)	(0.22)	(0.46)
Authority Approved Depreciation of Opening Capital Base	**12.29**	**26.63**	**29.03**	**31.39**	**33.70**	**133.05**

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 74, p. 209, ATCO Gas Australia, Tariff Model, September 2014, ERA, GDS Tariff Model, October 2014.

Assessment of General Method of Calculating the Opening Capital Base

413. The Authority has reviewed ATCO's approach in determining the proposed capital base values for the third access arrangement period, which includes the measure of inflation applied. The Authority is not satisfied that the method used by ATCO is consistent with rule 77(2) and rule 74 of the NGR as the values are not appropriately indexed. Therefore, the Authority has decided to adopt the following approach:

- Use the old ABS CPI series to escalate the capital base up to June 2012 when the ABS rebased the CPI to 100; and
- Use the new ABS CPI series after June 2012.

414. Table 26 shows the Authority's required amended values for calculating the opening capital base for the fourth access arrangement period taking into account the required amended CPI and required amendments to conforming capital expenditure in Table 24. The Authority requires that the opening capital base at 1 July 2014 be amended to $1,008.28 million.

Table 26 Authority Approved Opening Capital Base at 1 July 2014

Real $ million at 30 June 2014	Jan to June 2010	2010/11	2011/12	2012/13	2013/14
Opening Capital Base (AA3)	877.72	896.53	911.19	918.23	962.18
Plus: Capital Expenditure	31.09	41.30	36.07	75.34	79.80
Less: Depreciation	12.29	26.63	29.03	31.39	33.70
Closing Capital Base (AA3)	896.53	911.19	918.23	962.18	1,008.28
Authority Approved Opening Capital Base at 1 July 2014					**1,008.28**

Source: ERA, GDS Tariff Model, October 2014.

Required Amendment 6.

The opening capital base for 1 July 2014 in the proposed access arrangement must be amended to reflect the values in Table 26 of this Draft Decision.

Projected Capital Base

Regulatory Requirements

415. Rule 78 of the NGR establishes the approach to determine the projected capital base for an access arrangement period.

416. Rule 78 of the NGR states that the projected capital base for a particular period is:

> 78. Projected capital base
>
> (a) the opening capital base;
>
> plus:
>
> (b) forecast conforming capital expenditure for the period;
>
> less:
>
> (c) forecast depreciation for the period; and
>
> (d) the forecast value of pipeline assets to be disposed of in the course of the period.

417. Rule 79 of the NGR sets out the criteria that capital expenditure must meet to be considered conforming capital expenditure. As discussed previously in the opening capital base section, capital expenditure must be incurred by a prudent service provider acting efficiently, and the expenditure must be justifiable on economic, safety or regulatory grounds.

418. The Authority's discretion is limited under rule 79. Rule 40(2) of the NGR sets out the Authority's limited discretion powers. Rule 40(2) states that the regulator must not withhold its approval of an element of an access arrangement proposal if it is satisfied that the element complies with the applicable requirements of the NGL and is consistent with any applicable criteria (if any) prescribed by the NGL.

419. Rule 74 of the NGR provides that information in the nature of a forecast or estimate must be supported by a statement of its basis, and must be arrived at on a reasonable basis, and must represent the best forecast or estimate possible in the circumstances.

420. Rule 71 of the NGR is relevant to the Authority's consideration of actual and forecast capital expenditure against the requirements of rule 79 of the NGR, and states that:

> 71. Assessment of compliance
>
> 1) In determining whether capital or operating expenditure is efficient and complies with other criteria prescribed by these rules, the [Authority] may, without embarking on a detailed investigation, infer compliance from the operation of an incentive mechanism or on any other basis the [Authority] considers appropriate.
>
> 2) The [Authority] must, however, consider and give appropriate weight to, submissions and comments received when the question whether a relevant access arrangement proposal should be approved is submitted for public consultation.

421. Rule 88 of the NGR provides that the forecast depreciation of the capital base for the purpose of determining a reference tariff is to be calculated for each year of the access arrangement period on the basis set out in the depreciation schedule(s). The requirements in relation to forecast depreciation are set out in rule 89 of the NGR as described in the opening capital base section (paragraph 328).

ATCO's Proposed Changes

422. On 29 August 2014, ATCO revised its access arrangement proposal and proposed a projected capital base for the fourth access arrangement period of $1,551.93 million at 31 December 2019.[173] ATCO proposed revisions to its access arrangement for amendments to its IT services. ATCO's calculated values of the projected capital base for the fourth access arrangement period are shown in nominal dollars in Table 27 below.

Table 27 ATCO Proposed Projected Capital Base (AA4)

Nominal $ million	July to Dec 2014	2015	2016	2017	2018	2019
Opening Capital Base (AA4)	1,020.05	1,061.09	1,153.97	1,253.32	1,353.42	1,451.94
Capital Expenditure	45.87	108.40	119.81	124.97	127.43	132.73
Total Depreciation:	(4.83)	(15.52)	(20.45)	(24.86)	(28.91)	(32.74)
Closing Capital Base (AA4)	**1,061.09**	**1,153.97**	**1,253.32**	**1,353.42**	**1,451.94**	**1,551.93**

Source: ERA, GDS Tariff Model, October 2014.

423. ATCO has forecast to spend $606.92 million conforming capital expenditure for the fourth access arrangement period in real dollars.[174] ATCO's proposed spend of $606.92 million over a 5.5 year period, equates to $110.35 million per annum, which is 90 per cent higher than the third access arrangement period average annual capital expenditure forecast approved by the Authority.

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173 Nominal $ million.

174 Real $ million at 30 June 2014.

424. ATCO proposes that its forecast capital expenditure for the fourth access arrangement period conforms to the criteria under rule 79 of the NGR.

425. ATCO's Access Arrangement Information provides a breakdown of conforming capital expenditure by asset class and by cost driver.[175] Table 28 shows ATCO's proposed conforming capital expenditure by asset class.

Table 28 ATCO Proposed Capital Expenditure Forecast by Asset Class (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
High pressure mains - steel	2.63	16.92	37.70	36.78	30.42	29.48	153.92
High pressure mains - PE	0.22	0.50	0.00	1.17	4.23	6.76	12.89
Medium/low pressure mains	14.16	27.00	27.57	26.52	28.55	28.93	152.74
Regulators	1.78	2.84	1.52	1.48	1.50	1.95	11.08
Secondary gate stations	0.00	0.00	3.92	7.56	3.38	4.10	18.96
Buildings	1.00	9.45	0.63	0.43	0.02	0.02	11.54
Meter and services pipes	17.00	33.06	31.45	32.29	35.65	35.75	185.19
Equipment and vehicles	0.65	1.22	1.45	1.29	1.03	1.03	6.65
Vehicles	2.10	1.17	0.82	1.40	4.57	4.43	14.50
Information technology (including telemetry)	5.78	7.45	7.01	5.35	4.67	3.43	33.70
Land	0.00	4.85	0.55	0.35	0.00	0.00	5.75
ATCO Proposed Capital Expenditure Forecast	**45.31**	**104.46**	**112.64**	**114.62**	**114.03**	**115.87**	**606.92**

Source: ATCO Gas Australia, Tariff Model, September 2014.

426. ATCO has explained the increase in its proposed capital expenditure for the fourth access arrangement period using the same cost drivers as for the opening capital base. ATCO's cost drivers are:

- Sustaining capital expenditure
- Growth capital expenditure
- Structures and equipment capital expenditure
- IT capital expenditure

427. Table 29 and Figure 21 show the breakdown of ATCO's proposed capital expenditure for the fourth access arrangement period by cost driver.

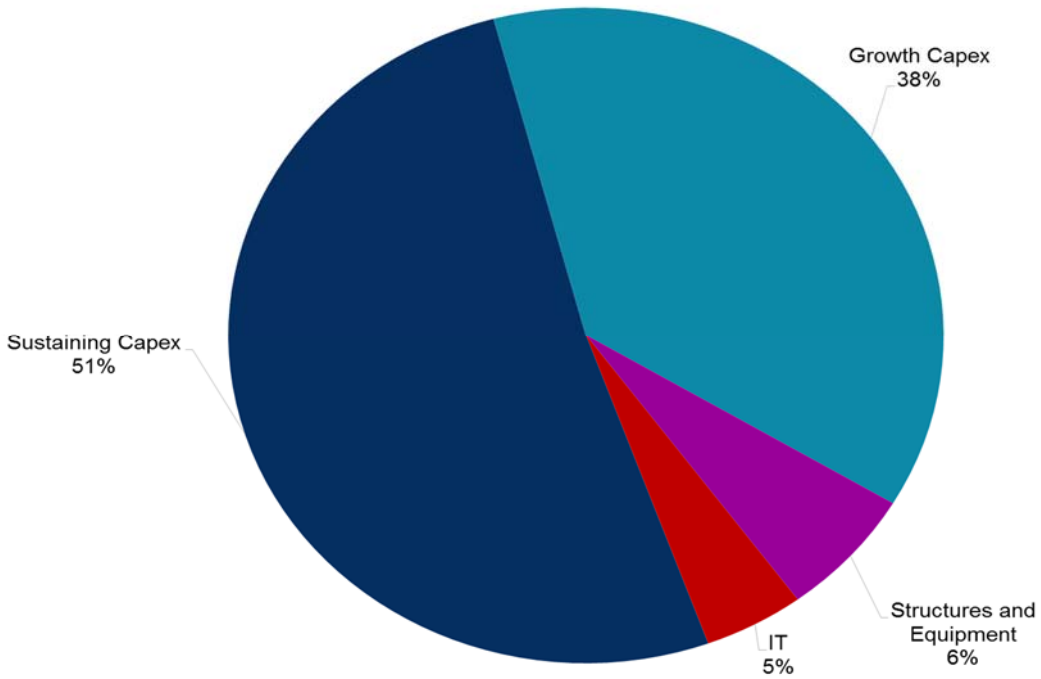
[175] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Tables 54 and 55, pp. 166-168.

Table 29 ATCO Proposed Capital Expenditure Forecast by Cost Driver (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Sustaining	17.72	42.01	51.53	64.15	63.30	72.59	311.30
Growth	18.72	39.20	51.81	42.64	41.46	34.70	228.53
Structures and equipment	3.75	16.69	3.45	3.47	5.62	5.47	38.45
IT	5.12	6.56	5.85	4.36	3.65	3.11	28.64
ATCO Proposed Capital Expenditure Forecast	**45.31**	**104.46**	**112.64**	**114.62**	**114.03**	**115.87**	**606.92**

Source: ATCO Gas Australia, Tariff Model, September 2014.

Figure 21 Breakdown of ATCO Proposed Capital Expenditure Forecast by Cost Driver (AA4)



Source: EMCa Review of Technical Aspects of the Proposed Access Arrangement, June 2014, Figure 29, p. 88.

428. Of the total ATCO forecast conforming capital expenditure for the fourth access arrangement period:

- sustaining capital expenditure accounts for 51 per cent ($311.29 million);
- growth capital expenditure accounts for 38 per cent ($228.54 million);
- structures and equipment capital expenditure accounts for 6 per cent ($38.45 million); and
- IT capital expenditure accounts for 5 per cent ($28.64 million).

429. ATCO submits that the increase in capital expenditure in the fourth access arrangement period is primarily driven by:

- increase in sustaining capital expenditure, which is required to comply with the requirements of the Safety Case and maintain system integrity;
- increase in growth capital expenditure, which includes customer initiated expenditure (approximately 101,000 new connections) and demand related expenditure;
- increase in structures and equipment such as operational depots, training centre, fleet and plant and equipment, to support the growing requirements of the network; and
- increase in IT expenditure, as a result of replacement of legacy and end of life systems.

430. ATCO has a number of network operating and support cost centres that support the capital investment program for sustaining and growth projects. These indirect costs are known as overheads and are required to complete the capital projects.

431. ATCO's labour costs and overhead costs include a proposed labour cost escalation factor of two per cent above CPI for each year of the fourth access arrangement period.

432. ATCO proposed forecast depreciation is $116.22 million in real dollars.[176] ATCO's forecast depreciation removes a double counting of inflation. ATCO has proposed to adopt a depreciation schedule that transitions over a number of access arrangement periods. ATCO's transition approach applies straight-line depreciation to the CCA value of the opening capital base for existing assets before 1 July 2014 and removes an amount relating to the inflationary gain. ATCO then applies straight-line depreciation to the HCA value of forecast capital expenditure.

Submissions

433. Alinta submit that ATCO's conforming capital expenditure for the fourth access arrangement period is significantly greater than the forecast conforming capital expenditure for the third access arrangement period.[177] Alinta has questioned ATCO's ability to undertake the level of capital expenditure proposed. Alinta has also requested that the Authority compare the proposed spend against other network industry benchmarks. Alinta has cautioned against network tariffs that reflect a level of capital expenditure that seems unreasonable, as this places an unnecessary burden upon users of the network.

434. Kleenheat's submission has expressed concern with the magnitude of the capital expenditure, which appears materially disproportionate to the growth of the network.[178]

Considerations of the Authority

435. The Authority has considered whether ATCO's proposed value of the projected capital base for the fourth access arrangement period meets the requirements of the NGR. These considerations are documented below under headings of:

- determination of the capital base, taking into account an assessment of:

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176 Real $ million at 30 June 2014.

177 Alinta Energy, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014, p. 2.

178 Kleenheat Gas, *Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014, p. 2.

- ATCO's proposed forecast capital expenditure in the fourth access arrangement period against the requirements of rule 79 of the NGR;
- ATCO's proposed depreciation; and

- assessment of the general method applied in calculating the projected capital base.

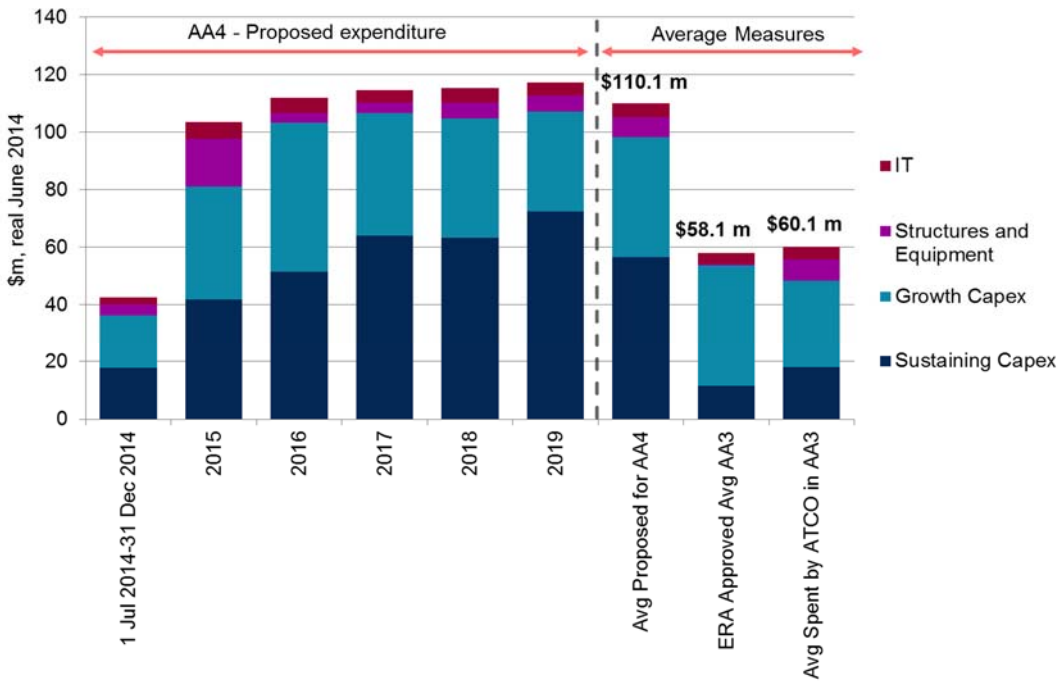
436. The Authority appointed a technical advisor (Energy Market Consulting associates, **EMCa**) to assess ATCO's proposed capital expenditure, operating expenditure, and governance processes.

Assessment of Capital Expenditure

437. ATCO's proposed capital expenditure for the fourth access arrangement period is equivalent to an average annual expenditure of $110.35 million. The Authority approved average annual capital expenditure forecast for the third access arrangement period is equivalent to $58.1 million, and ATCO's average annual proposed conforming capital expenditure is $60.1 million.

438. The left hand side of Figure 22 depicts the profile of ATCO's proposed capital expenditure for the fourth access arrangement period. The right hand side of the figure compares the average annual capital expenditure proposed by ATCO for the fourth access arrangement period, annual average amount approved by the Authority for the third access arrangement period and the annual average amount spent by ATCO in the third access arrangement period.

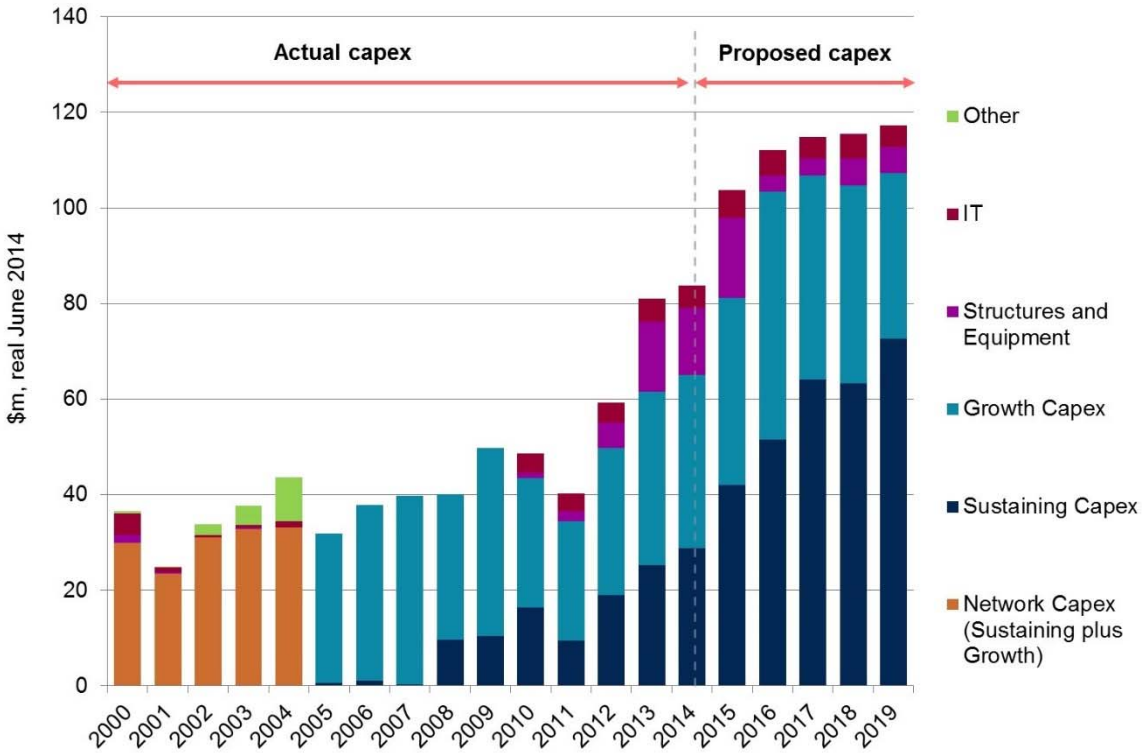
Figure 22 Profile of ATCO Proposed Capital Expenditure Forecast (AA4)



Source: EMCa, Review of Technical Aspects of the Proposed Access Arrangement, June 2014, Figure 30, p. 88.

439. Figure 23 compares ATCO's actual capital expenditure since 2000 with ATCO's proposed capital expenditure for the fourth access arrangement period.

Figure 23 Actual Capital Expenditure and Proposed Capital Expenditure (2000-2019)



Source: EMCa, Review of Technical Aspects of the Proposed Access Arrangement, June 2014, Figure 31, p. 89.

440. Relying on advice from EMCa, the Authority has assessed ATCO's proposed capital expenditure forecast for the fourth access arrangement period in accordance with the NGR using a three-step framework:[179]

- evaluate whether the expenditure is justifiable on the grounds set out in rule 79(2) of the NGR;
- consider whether the expenditure satisfies the prudent service provider test set out in rule 79(1)(a) of the NGR; and
- assess whether forecasts or estimates comply with rule 74(2) of the NGR.

441. EMCa has assessed ATCO's governance framework and processes in relation to capital expenditure forecasting. EMCa's review has focused on ATCO's policies, processes, procedures and reference documents that relate to project and program development, approval and delivery. EMCa conducted the review in relation to ATCO's corporate objectives and regulatory obligations, in addition to good industry practice.

442. In relation to capital expenditure forecasting, EMCa has advised the Authority it has the following concerns:

- ATCO has not justified the Safety Case thresholds that it has applied, in particular, for supply security levels.

[179] EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, 6 June 2014, pp. 17-19.

- ATCO has developed its forecasts using a bottom-up approach by incremental aggregation of detailed activity forecasts that have largely been determined by subjective assessments for which the assumptions cannot therefore be independently verified. EMCa considers that the forecasts have not been subject to sufficient top-down challenge, which has lead ATCO to over-estimate capital expenditure forecasts.
- ATCO has claimed that the significant increases in capital expenditure that it has proposed, are required to address existing performance issues. However, with few exceptions ATCO has been unable to provide evidence of those issues or to demonstrate the improvements in performance that would result from the proposed expenditure.
- ATCO's business case process includes, among other things, a requirement to assess the benefits from proposed expenditure. EMCa has found that, with a few exceptions, ATCO has provided insufficient evidence of tangible benefits of proposed capital expenditure for the fourth access arrangement period.
- ATCO's proposed forecast capital expenditure is higher than budgeted amounts in recent business plans. Moreover, for the two years for which information was provided to EMCa, ATCO underspent even those lower budget amounts.

443. On 29 August 2014, ATCO proposed revisions to its access arrangement for amendments to its IT services. EMCa submitted its final report in June 2014, therefore its review is on ATCO's original IT figures.

444. The Authority has reviewed ATCO's forecast capital expenditure under the following cost drivers:

- Sustaining capital expenditure
- Growth capital expenditure
- Structures and equipment capital expenditure
- IT capital expenditure

445. The Authority has also reviewed ATCO's calculation of overheads and labour escalation in its forecast capital expenditure.

Sustaining Capital Expenditure

446. ATCO proposes to spend $311.30 million on sustaining capital expenditure:

- $133.60 million on asset performance and safety; and
- $177.69 million on asset replacement.[180]

447. With the exception of the Two Rocks, Peel, Elizabeth Quay and Perth CBD projects, ATCO has sought to justify all of its proposed forecast sustaining capital expenditure for the fourth access arrangement period under one or more of the grounds in rule 79(2)(c) of the NGR. ATCO states that sustaining capital expenditure is required to maintain and improve service safety and integrity, and meet regulatory obligations and requirements. ATCO has attributed most of its proposed increase in sustaining capital expenditure to the GDS Safety Case.

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[180] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Section 8.5.1, pp. 169-181.

448. The GDS Safety Case has been developed in consultation with Energy*Safety* under the *Gas Supply and System Safety Standard Regulations 2000.* ATCO has noted that the Safety Case will be revised and re-submitted to Energy*Safety* this year. According to ATCO, sustaining capital expenditure is driven by the Safety Case and the need to reduce risk to As Low As Reasonably Practicable (**ALARP**). As part of the Safety Case, ATCO conducted Formal Safety Assessments (**FSA**) for all asset classes. ATCO has applied the ALARP test to identify the actions that are required to reduce network risks.

449. ATCO forecasts $133.60 million of investment on asset performance and safety over the fourth access arrangement period, which covers the following:

- Installation of high pressure pipelines, interconnections and associated pressure reduction infrastructure to provide supply security and reliability to the network.
- Upgrade of high pressure network assets to accommodate inline inspections.

450. ATCO has relied on its application of the ALARP test to justify its forecast sustaining capital expenditure on security of supply projects, under rule 79(2)(c) of the NGR. Security of supply projects include interdependency, high pressure spur line and transmission interconnection projects.

451. EMCa has assessed the Safety Case, FSAs and the risk thresholds that ATCO has adopted when applying the ALARP test[181] to security of supply projects, and has the following concerns:

- ATCO has not conducted a cost benefit analysis.
- ATCO has adopted a risk threshold for catastrophic events that appears to be lower than the threshold employed by other gas distribution networks. EMCa considers that the risk threshold that ATCO has adopted of 25,000 customers for loss of supply to be catastrophic is not prescribed in AS/NZS4645 and AS2885, nor mandated by Energy*Safety*, and is low by industry standards.

452. Based on EMCa's advice, the Authority is not satisfied that the security of supply related portion in asset performance and safety ($86.34 million) is consistent with good industry practice as required by rule 79(1)(a) of the NGR. Therefore, the Authority is not satisfied that the following projects are justified under any ground in rule 79(2) of the NGR:

- Two Rocks Spur line ($18.13 million);
- Peel Spur Line ($20.93 million); and
- interdependency projects ($47.29 million).

453. EMCa recommends that ATCO's remaining proposed forecast sustaining capital expenditure on asset performance and safety ($24.5 million) is justified under one or more of the grounds in rule 79(2)(c) of the NGR, and is in line with good industry practice. EMCa also considers that the Elizabeth Quay, Perth CBD risk reduction and Parmelia Pipeline interconnection projects ($22.8 million) are justifiable under rule 79(2)(c) of the NGR. EMCa considers that if these projects were not undertaken, then a supply interruption would have 'catastrophic' consequences.

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[181] EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 102-109.

454. EMCa has identified that ATCO's proposed forecast sustaining capital expenditure on asset replacement consists of a mix of new projects, and a continuation of a number of projects from the third access arrangement period. EMCa is satisfied that the projects continuing from the third access arrangement period are justified under one or more of the grounds set out in rule 79(2)(c) of the NGR. However, EMCa has advised that $11.05 million for the end of life replacement of unprotected metallic mains project meets the requirements of rule 79(1) of the NGR. EMCa considers that ATCO has used the end of the fourth access arrangement period as an artificial deadline to complete this work. EMCa considers that a prudent service provider would allow the works to be carried out in the same manner as has been assumed for 2015 to 2017 in 2018 and 2019, and recommends that the project be extended into the fifth access arrangement period.

455. The Authority has reviewed EMCa's recommendations in relation to ATCO's forecast sustaining capital expenditure for the fourth access arrangement period. The Authority accepts EMCa's view that ATCO's risk thresholds are not consistent with AS/NZS4645 and AS2885 or other gas distribution networks, and that ATCO has not provided a cost benefit analysis for security of supply projects. In relation to asset replacement, the Authority also agrees with EMCa that ATCO appears to have used the end of the fourth access arrangement period as an artificial deadline to complete the work of replacing end of life unprotected metallic mains.[182]

456. The Authority has decided that $213.90 million of ATCO's forecast sustaining capital expenditure for the fourth access arrangement period can be considered conforming under rule 79 of the NGR. The Authority is satisfied due to the reasons described in paragraphs 451 – 455 above that $97.39 million ($86.34 million for security of supply and $11.05 million for replacement of unprotected metallic mains) of ATCO's forecast sustaining capital expenditure is not consistent with the applicable criteria in rule 79 of the NGR.

457. Table 30 shows ATCO's proposed sustaining capital expenditure forecast, and the Authority's required reductions for the fourth access arrangement period.

[182] EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, p. 108.

Table 30 Authority Approved Sustaining Capital Expenditure Forecast (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
ATCO Proposed Sustaining Capital Expenditure Forecast	**17.72**	**42.01**	**51.53**	**64.15**	**63.30**	**72.59**	**311.29**
Two Rocks spur line reduction			(5.50)	(12.63)			(18.13)
Peel spur line reduction					(10.47)	(10.46)	(20.93)
Interdependency reduction			(6.62)	(11.06)	(10.62)	(18.99)	(47.29)
Deferral of metallic mains reduction					(2.81)	(8.24)	(11.05)
Total reductions			(12.12)	(23.69)	(23.90)	(37.69)	(97.39)
Authority Approved Sustaining Capital Expenditure Forecast	**17.72**	**42.01**	**39.41**	**40.46**	**39.40**	**34.90**	**213.90**

Source: ERA, GDS Tariff Model, October 2014.

Growth Capital Expenditure

458. ATCO proposes to spend $228.53 million on growth capital expenditure:

- $156.31 million on customer initiated; and
- $72.22 million on demand capital expenditure.[183]

459. On an annualised basis, ATCO is proposing to spend 37 per cent more on growth capital expenditure than it did during the third access arrangement period. ATCO has forecast an increase in growth capital expenditure in line with its expectation of increased housing connections.

460. ATCO has sought to justify its forecast growth capital expenditure in the fourth access arrangement period under rule 79(2)(b) of the NGR. ATCO has presented a Net Present Value (**NPV**) analysis for its proposed growth expenditure of $228.54 million based on the incremental revenue test set out in rule 79(2)(b) of the NGR. ATCO has undertaken its NPV analysis on an aggregated basis, and has not presented justification as to whether individual projects may yield a positive NPV. EMCa has reviewed both ATCO's NPV analysis and individual projects, in order to determine whether they can be justified under rule 79(2) of the NGR.

461. ATCO has estimated that, in NPV terms, the incremental revenue associated with growth capital expenditure exceeds the proposed expenditure of $228.54 million. ATCO has stated that the NPV of growth capital expenditure will be positive by 2035.

462. EMCA has reviewed ATCO's NPV analysis, and has carried out a sensitivity test on its volume and tariff assumptions. EMCa's assessment identified two assumptions that it

[183] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Section 8.5.2, pp. 181-195.

advises do not represent the best forecast or estimate possible to meet the requirements of rule 74(2) of the NGR, which renders ATCO's proposed justification under rule 79(2)(b) invalid.[184]

463. The first assumption relates to the annual consumption of ATCO's customer base. As the starting point for its assessment of future net revenues from new customers, ATCO has used the average annual consumption of existing customers rather than the average annual consumption of new customers. ATCO has provided data that shows that the average consumption of new customers has been declining. EMCa considers that consumption levels should be adjusted to better reflect the annual consumption of new customers, which is 3.5 gigajoules per annum lower than ATCO has assumed.

464. The second assumption is regarding the rise in prices. ATCO has assumed increases of the order of 5.6 per cent per year through to 2019, though declining thereafter. EMCa does not consider it valid for ATCO to assume price rises that are based on the recovery of higher costs resulting from proposed high levels of capital expenditure. EMCa considers that the NPV analysis should assume that prices would rise only by the inflation rate.

465. EMCa has tested the sensitivity of the NPV analysis to the assumptions of average consumption and price rises. EMCa has found that using the annual level of consumption for new customers and raising prices by inflation only render the NPV negative. This means that ATCO's aggregated growth capital expenditure forecast for the fourth access arrangement period fails the incremental revenue test.

466. EMCa has also highlighted that the outcome of the NPV analysis would worsen further under the following likely scenarios:

- Annual consumption of new customers declines further.
- Investment in key growth spur lines ($44.0 million) is reallocated from sustaining capital expenditure to growth capital expenditure.
- ATCO's proposed restructure of B3 tariffs is not allowed.

467. ATCO has not provided justification as to whether individual projects yield a positive NPV. Therefore, EMCa has examined the evidence that ATCO has provided in support of each of the projects to determine whether it can be justified under rule 79(2) of the NGR. [185]

468. The Authority is satisfied that EMCa has correctly assessed ATCO's incremental revenue test. The Authority has accepted EMCa's advice that after the sensitivity test is applied the NPV becomes negative, which means that the aggregated expenditure fails the incremental revenue test. The Authority is also satisfied with EMCa's approach to review individual projects and assess whether they can be justified under rule 79(2) of the NGR.

469. EMCa's assessment broke down growth capital expenditure on customer initiated projects between greenfield developments and brownfield infill projects. EMCa recommended that ATCO's proposed brownfield infill customer initiated projects can be justified under rule 79(2)(c)(iii) of the NGR, as the expenditure is necessary to comply with a regulatory obligation. ATCO is required under the terms of its licence to

[184] EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 112-121.

[185] EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, Table 21, pp. 118-120.

offer to connect any service that is on the line of a gas main with up to 20 meters of service line.

470. EMCa has analysed ATCO's proposed greenfield customer initiated capital expenditure under rule 79(2)(b) of the NGR. According to EMCa, 63 per cent of ATCO's growth capital expenditure on customer initiated projects can be allocated to greenfield developments ($105 million) and 37 per cent to brownfield infill projects ($51 million). The Authority has sought evidence from ATCO on this allocation, and ATCO has clarified that it has allocated 94 per cent of growth capital expenditure on customer initiated projects to greenfield projects ($146.24 million) and 6 per cent to brownfield projects ($10.09 million).[186]

471. EMCa assumes that $19.8 million of mains and greenfields sites have already been installed, and therefore that service connections to those mains will be conforming capital expenditure and thus could satisfy rule 79 of the NGR. The Authority agrees with EMCa's view that ATCO's greenfield customer initiated capital expenditure is not justified under rule 79(2)(c)(iii) of the NGR. The Authority does not share EMCa's assumption that $19.8 million of service connections will be conforming capital expenditure as some mains and greenfields sites have already been installed. The Authority considers that ATCO has not provided any evidence of its proposed greenfield growth capital expenditure on greenfield customer initiated projects. ATCO has not provided any evidence that the large and relatively generic expansion initiative of greenfield customer initiated capital expenditure satisfies the incremental revenue test. Therefore, the Authority is not satisfied that $146.24 million is justified under rule 79(2)(b) of the NGR.

472. Based on EMCa's advice, the Authority accepts EMCA's recommendation that ATCO is required under the terms of its licence to offer to connect any service that is on the line of gas main with up to 20 metres of service line. The Authority is satisfied that $9.02 million for brownfield customer initiated capital expenditure is justified under rule 79(2)(c)(iii) of the NGR.

473. EMCa is not satisfied that the following proposed demand spur line projects ($38.63 million) meet the incremental revenue test in rule 79(2)(b) of the NGR:

- Two Rocks (60 per cent of cost or $27.22 million);
- Baldivis ($5.42 million); and
- Peel (22 per cent of costs or $5.99 million).

474. According to EMCa, the feasibility studies that ATCO provided for Two Rocks, Baldivis and Peel do not contain a cost benefit analysis. Moreover, the feasibility study for the Peel project contains insufficient information on the underlying assumptions.

475. Relying on EMCa's advice, the Authority is not satisfied that the following proposed reinforcement projects ($19.67million) are justified under rule 79(2)(b) of the NGR:

- Capel to Busselton ($5.21 million)
- Other reinforcements ($11.55 million of ATCO's proposed $16.2 million)
- Volume related capital expenditure and regulating facilities ($2.91 million)

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186 ATCO Gas Australia, *Email response to ERA26*, 11 July 2014.

476. ATCO has sought to justify the Capel to Busselton project on integrity grounds. EMCa considers that the project description in the access arrangement information suggests that the project is required to maintain pressure to connect new customers, rather than existing customers. Therefore, EMCa's view is that this project should be assessed using the incremental revenue test in rule 79(2)(b) of the NGR, rather than the service integrity test under rule 79(2)(c)(ii). ATCO has not provided any feasibility study or cost benefit analysis for this project. Therefore EMCa is not satisfied that this project meets the incremental revenue test in rule 79(2)(b) of the NGR.

477. ATCO has identified weak pressure areas that require reinforcement to enable the connection of new customers. As a result ATCO has proposed $16.2 million for 21 reinforcement projects. The $16.2 million consists of $5.3 million for the Pinjarra reinforcement and $10.9 million for 20 smaller reinforcement projects that are detailed in Table 31 of ATCO's AMP.[187] EMCa advised that there was insufficient justification of these reinforcement projects. EMCa has not been able to determine which reinforcements are associated with greenfield developments and which are brownfield. Therefore, EMCa has recommended applying a pro-rata adjustment to ATCO's proposed $16.2 million for these reinforcement projects.[188] EMCa recommended that 71 per cent ($11.55 million) of these costs of the proposed reinforcements are not justified under rule 79 of the NGR, on the grounds that they are not required to support the assumed growth in greenfield developments, as EMCa has not recommended that capital expenditure for these greenfield developments meet rule 79 of the NGR.

478. EMCa advised that ATCO's proposed growth capital expenditure on volume related capital expenditure and regulating facility projects does not meet the incremental revenue test in rule 79(2)(b) of the NGR. This is because ATCO has not provided a cost benefit analysis to demonstrate that its proposed growth capital expenditure is justified.

479. EMCa advised that the Elizabeth Quay and Perth CBD risk reduction projects ($9.3 million) are justified under rule 79(2)(b) of the NGR. ATCO's NPV analysis has indicated a positive NPV of $2.4 million for security of supply and growth projects. EMCa considers that the Elizabeth Quay and Perth CBD projects are non-residential projects. Therefore, EMCa considers that its concern in relation to ATCO's assumed average consumption per customer in the NPV analysis is not relevant for the Elizabeth Quay and Perth CBD projects.

480. EMCa recommends that a portion of reinvestment projects ($4.7 million) is justified under rule 79(2) of the NGR.

481. The Authority has reviewed EMCa's recommendations, and has decided that $24.0 million on growth capital expenditure for the fourth access arrangement period is conforming under rule 79 of the NGR. The expenditure covers the following projects:

- Elizabeth Quay and Perth CBD project;
- $4.7 million of the proposed reinforcement projects; and
- brownfield customer initiated projects.

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[187] Table 65 in ATCO's access arrangement information includes the Pinjarra reinforcement project within the Peel spur line project.

[188] EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, Table 21, p. 120.

482. The Authority has decided, for the reasons described in paragraphs 462 – 482 that $204.54 million of ATCO's proposed growth capital expenditure for the fourth access arrangement period is not conforming and therefore inconsistent with the applicable criteria under rule 79 of the NGR. This expenditure covers the following projects:

- Two rocks, Peel and Baldivis spur lines;
- Capel to Busselton reinforcement;
- a percentage of reinforcement projects;
- volume related demand capital expenditure and regulating facilities; and
- greenfield customer initiated projects.

483. Table 31 shows ATCO's proposed growth capital expenditure forecast, and the Authority's approved growth capital expenditure forecast for the fourth access arrangement period.

Table 31 Authority Approved Growth Capital Expenditure Forecast (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total Forecast AA4
ATCO Proposed Growth Capital Expenditure Forecast	**18.72**	**39.20**	**51.81**	**42.64**	**41.46**	**34.70**	**228.53**
Two Rocks spur line			(13.64)	(13.58)			(27.22)
Peel spur line					(5.99)		(5.99)
Baldivis spur line					(5.42)		(5.42)
Capel to Busselton reinforcement						(5.21)	(5.21)
Other reinforcements	(0.53)	(4.88)	(4.06)	(0.58)	(0.96)	(0.53)	(11.55)
Volume related demand capital expenditure	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.22)
Regulating facilities	(0.31)	(0.48)	(0.47)	(0.47)	(0.48)	(0.48)	(2.69)
Greenfield customer initiated	(14.48)	(26.91)	(26.01)	(25.99)	(26.40)	(26.45)	(146.24)
Total reductions	(15.34)	(32.31)	(44.22)	(40.66)	(39.29)	(32.71)	(204.53)
Authority Approved Growth Capital Expenditure Forecast	**3.38**	**6.89**	**7.59**	**1.98**	**2.17**	**1.99**	**24.00**

Source: ERA, GDS Tariff Model, October 2014.

Structures and Equipment Capital Expenditure

484. ATCO has forecast structures and equipment capital expenditure for the fourth access arrangement period at $38.45 million[189], broken down in the access arrangement Information as follows:

- $17.29 million on operational depots and training centre;

[189] ATCO Gas Australia, *Access Arrangement Information, 17 March 2014*, Section 8.6, Table 67, p. 194.

- $14.50 million on fleet; and
- $6.65 million on plant and equipment.

485. ATCO has attributed the increased expenditure to the following:

- Change in strategy to own and operate depots and fleet, rather than lease them.[190] EMCa has agreed with ATCO's cost efficiency rationale for this strategy;
- Network growth; and
- Safety Case requirements.

486. ATCO has sought to justify its forecast structures and equipment capital expenditure based on the following grounds:

- Rule 79(2)(c)(i)[191] of the NGR for the proposed expenditure on depots and training centre; and
- Rule 79(2)(a)[192] of the NGR for the proposed expenditure on fleet.

487. EMCa considers that the primary driver for depot relocation or establishment for Bunbury and Busselton is network growth.[193] EMCa advised that the Bunbury depot will continue to be operationally adequate for several more years (but will still need to be upgraded during the fourth access arrangement period). EMCa considers that ATCO's growth projections are overstated and the establishment of the Busselton depot can be prudently deferred to the fifth access arrangement period. On the basis of EMCa's findings, the Authority is not satisfied that $1.18 million for the Busselton depot satisfies rule 79 of the NGR.

488. The Authority considers that $0.50 million for Osborne Park blue flame kitchen does not satisfy rule 79(2)(c)(i) of the NGR. EMCa did not consider that ATCO had included the Osborne Park blue flamed kitchen as it was not mentioned in its access arrangement information. However, the Authority received conformation that the Osborne Park blue flamed kitchen formed part of ATCO's forecast structures and equipment capital expenditure.[194] The Authority considers that the Osborne Park blue flame kitchen should be removed, consistent with the removal of the Jandakot blue flame kitchen in the third access arrangement as EMCa recommended that the project's link to safety is weak.

489. In relation to expansion of existing training facilities, EMCa notes that ATCO's policy to approve the project requires that it prepares a detailed business case and cost-benefit analysis. EMCa further notes that the project will be subject to an ex-post review within five years. Therefore, the Authority is satisfied that ATCO's proposal to expand its existing training facilities is likely to satisfy rule 79 of the NGR.

490. EMCa accepts that ATCO's economic evaluation in moving from leasing to purchasing vehicles over a 20 year period shows a relatively small net benefit. However, EMCa considers that ATCO's demand forecast for the fourth access arrangement is over ambitious, and that not all its growth-related expenditure is required. Therefore, EMCa

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190 ATCO Gas Australia, R*esponse to EMCa27*, 14 April 2014.

191 NGR, Rule 79(2)(c)(i): maintain and improve the safety of services.

192 NGR, Rule 79(2)(a): overall economic value of the expenditure is positive.

193 EMCa, Review of Technical Aspects of the Proposed Access Arrangement, June 2014, pp. 123-126.

194 ATCO Gas Australia, R*esponse to ERA45*, 11 August 2014.

assessed that $13.75 million of ATCO's proposed $14.5 million forecast structures and equipment capital expenditure on fleet is justified under rule 79(2), of the NGR and satisfies the prudent service provider test in rule 79(1)(a) of the NGR.

491. EMCa recommends that $0.20 million of ATCO's forecast structures and equipment capital expenditure on equipment is not justified under rule 79 of the NGR. EMCa's recommendation is consistent with its findings regarding ATCO's overstated growth projections.

492. The Authority accepts EMCa's recommendation and has decided that, for the reasons outlined above, $2.68 million for structures and equipment capital expenditure does not satisfy rule 79 of the NGR.

493. The Authority is satisfied that $35.77 million complies with rule 79 and so can be considered conforming capital expenditure.

494. Table 32 shows ATCO's proposed structures and equipment capital expenditure forecast, and the Authority's required reductions for the fourth access arrangement period.

Table 32 Authority Approved Structures and Equipment Capital Expenditure Forecast (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total Forecast AA4
ATCO Proposed Structures and Equipment Capital Expenditure Forecast	**3.75**	**16.69**	**3.45**	**3.47**	**5.62**	**5.47**	**38.45**
Busselton reduction			(1.18)				(1.18)
Osborne Park Blue Flamed Kitchen		(0.50)					(0.50)
Fleet reduction					(0.40)	(0.40)	(0.80)
Plant & Equipment reduction						(0.20)	(0.20)
Total reductions		(0.50)	(1.18)		(0.40)	(0.60)	(2.68)
Authority Approved Structures and Equipment Capital Expenditure Forecast	**3.75**	**16.19**	**2.27**	**3.47**	**5.22**	**4.87**	**35.77**

Source: ERA, GDS Tariff Model, October 2014.

IT Capital Expenditure

495. ATCO proposes to spend $28.65 million on IT capital expenditure during the fourth access arrangement period:[195]

- $3.0 million for acquisition of unique IT Infrastructure from ATCO I-Tek;
- $8.8 million for network operations;

[195] ATCO Gas Australia, *Letter to ERA*, 29 August 2014.

- $5.4 million for commercial operations;
- $8.8 million for business support improvements;
- $2.0 million for business support upgrades; and
- $0.7 million on IT hardware and software.

496. ATCO explained in its access arrangement information that ATCO receives IT services from ATCO I-Tek Australia (I-Tek) under a contractual agreement known as the Information Technology Services Agreement (ITSA). ATCO stated that the agreement was due to expire at the beginning of 2015, and that ATCO was reviewing its options in respect of the replacement of the existing ITSA.

497. On 17 July 2014, ATCO advised the Authority that its IT provider I-Tek was to be sold to a separate party which would then provide services to ATCO Gas Australia. From 1 January 2015, WIPRO a fully arm's length IT provider will provide IT services to ATCO Gas Australia. The services to be provided under the new arrangements remain the same. However, the key changes are that ATCO Gas Australia will take ownership of its key business applications such as the Enterprise Resource Planning system, SAP, and it's Document Management System. These were previously owned by I-Tek and subject to a Usage Fee.

498. ATCO submits that IT capital cost forecast will increase by $1.2 million from $27.4 million to $28.6 million as a result of ATCO acquiring relevant I-Tek assets and savings applied to future capital projects. ATCO has submitted a revised forecast IT capital expenditure by business driver.

499. In aggregate, ATCO is proposing to spend $5.2 million on IT capital expenditure per annum in the fourth access arrangement period. ATCO's proposed annual IT capital expenditure forecast is 20 per cent higher than the $4.3 million per annum that it has spent in the third access arrangement period. ATCO has attributed the increase in proposed IT capital expenditure to cost effective network maintenance and operation, and regulatory obligations.

500. ATCO has sought to justify its proposed IT capital expenditure forecast for the fourth access arrangement period under one or more of the grounds in rule 79(2)(c) of the NGR.

501. EMCa submitted its final report in June 2014, therefore its IT capital expenditure review is on ATCO's original IT figures. EMCa carried out an assessment of ATCO's original proposed IT capital expenditure in relation to:[196]

- overall expenditure trend;
- review of a sample of projects, for which ATCO has provided feasibility study documents;
- ATCO's governance process and application;
- ATCO's IT Strategy and IT Asset Management Plan (**AMP**); and
- ATCO's capability to deliver the proposed work program.

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[196] EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 127-136.

502. ATCO originally proposed to spend $27.4 million on IT capital expenditure during the fourth access arrangement period:[197,198]

- $12.6 million for network operations;
- $8.1 million for commercial operations;
- $4.1 million for business support improvements;
- $1.9 million for business support upgrades; and
- $0.7 million on IT hardware and software.

503. ATCO originally proposed to spend $12.6 million of IT capital expenditure on network operations, which are systems dedicated to operations that ensure the reliable, safe and efficient delivery of gas to consumers. EMCa identified nine projects in this category, and reviewed three of these projects of total value at over $2 million. EMCa recommends that $0.35 million of ATCO's proposed IT capital expenditure on network operations is not justified under rule 79 of the NGR. EMCa's review has found that $0.35 million for unspecified future regulatory requirements in the Geographical Information Systems continuous improvement project does not satisfy rule 74(2) of the NGR[199], as it is based on a speculative future requirement.

504. ATCO originally proposed to spend $8.1 million of IT capital expenditure on commercial operations, in order to support the delivery of accurate and timely metering and billing data to retailers. EMCa has identified five projects in this category, and has reviewed two projects whose total value exceeds $2 million. EMCa recommends that $2.54 million of ATCO's proposed IT capital expenditure on commercial operations is not justified under rule 79 of the NGR. EMCa's review has found that a considerable portion of ATCO's IT capital expenditure in the third access arrangement period has been on commercial operations. ATCO has forecast a further increase in this expenditure in the fourth access arrangement period. ATCO has justified this increase by its requirement to further refine its systems and processes with the entrance of a new natural gas retailer. EMCa understands that the new retailer is already operating in the market, and considers that $2.54 million for the commercial services continuous improvements project is speculative and not justified under any of the grounds set out in rule 79(2) or rule 74(2) of the NGR.

505. ATCO originally proposed to spend $4.1 million of IT capital expenditure on business support improvements, in order to ensure consistent data management, analysis and reporting. EMCa has identified four projects in this category, and has reviewed one project whose value exceeds $2 million. EMCa's review has found that it is unclear that ATCO will be able to implement the business process standardisation and the strategic asset management projects in parallel. EMCa considers that a prudent service provider acting in the manner prescribed in rule 79(1)(a) would not commence the business process standardisation project until 2017, in order to avoid overlapping of projects. Therefore, EMCa recommends that $0.86 million of ATCO's proposed IT capital expenditure on business support improvements is not justified under rule 79 of the NGR and should be deferred to the fifth access arrangement period.

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197 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Section 8.7, Table 72, p. 201.

198 ATCO's proposed IT capital expenditure included $2.57 million for ATCO I-Tek overhead fees.

199 NGR 74(2), a forecast or estimate: (a) must be arrived at on a reasonable basis; and (b) must represent the best forecast or estimate possible in the circumstances.

506. ATCO originally proposed to spend $2.6 million of IT capital expenditure on business support upgrades, and hardware and software replacements to support growth and operational improvements. EMCa recommends that $0.3 million of IT capital expenditure on business support upgrades and $0.76 million of on hardware and software replacements is not justified under rule 79 of the NGR. ATCO has not provided any information to support this proposed expenditure.

507. EMCa recommended that $4.82 million of ATCO's original proposed IT capital expenditure does not comply with rule 79 of the NGR. This included the following amounts in the following projects:

- AGA-01, commercial services continuous improvements, $2.54 million;
- AGA-02, GIS continuous improvements, $0.35 million;
- AGA-11, business process standardisation, $0.86 million;
- AGA-19, new technology business cases, $0.30 million; and
- IT hardware & equipment, $0.76 million.

508. The Authority has decided to accept EMCa's recommendations for the projects listed above. The Authority accepts EMCa's recommendations that some elements in ATCO's proposed IT capital expenditure on network and commercial operations are speculative, and therefore not justified under rules 74 and 79 of the NGR. The Authority accepts EMCa's recommendation that the business process standardisation project does not meet rule 79(1)(a) of the NGR, and should be deferred to the fifth access arrangement period. The Authority also agrees with EMCa's view that IT capital expenditure on business support upgrades, and hardware and software replacements is not justified under rule 79 of the NGR, as ATCO has not provided any supporting information at all to support this expenditure.

509. EMCa's review on ATCO's original proposal remains applicable as ATCO has not removed any of these projects as a result of the new IT agreement it has entered into. The Authority has adjusted EMCa's proposed reductions to $3.51 million in accordance with ATCO's revised project amounts.[200] The Authority is not satisfied that $3.51 million of ATCO's proposed IT capital expenditure for the fourth access arrangement period complies with rule 79 of the NGR. This includes the following amounts in the following projects:

- AGA-01, commercial services continuous improvements, $1.79 million;
- AGA-02, GIS continuous improvements, $0.25 million;
- AGA-11, business process standardisation, $0.70 million;
- AGA-19, new technology business cases, $0.07 million; and
- IT hardware and equipment, $0.70 million.

510. The Authority notes that ATCO's original proposal of $27.4 million included:

- $24.65 million for IT projects.
- $0.70 million for IT hardware and equipment.
- $(0.50) million for Albany and Kalgoorlie.

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[200] ATCO Gas Australia, *Revisions to its IT agreement, Attachment 6*, 12 September 2014.

- $2.57 million for ATCO I-Tek overheads.

511. The Authority notes that ATCO's revised proposal of $28.65 million includes:

- $25.44 million for IT projects.
- $0.70 million for IT hardware and equipment.
- $(0.50) million for Albany and Kalgoorlie.
- $3.0 million for acquisition of IT assets from ATCO I-Tek.

512. The Authority notes that the projects in ATCO's original proposal included overhead fees of $2.57 million for I–Tek and it appears that these overheads have been removed. ATCO's proposal includes a reduction for non-regulated areas, which removes costs for Kalgoorlie and Albany.

513. ATCO states that there is no change from the asset management plan for its revised proposal, however, this does not appear to be the case as ATCO has added four new projects with a value of $1.77 million. ATCO has amended the forecast budget of most projects without any justification. These amendments result in an overall increase of $0.35 million.

514. As a result of the new IT arrangements, ATCO has bought $3.0 million worth of assets from I-Tek who are a related party. ATCO has justified this spend by providing a business case for a SAP Environmental Health Safety and risk Management project with a value of $1.67 million and a breakdown of the assets ATCO has bought.

515. The Authority notes that ATCO submitted its revised forecast IT expenditure after EMCa finalised its report and the Authority did not request EMCa to review ATCO's revisions. The Authority has decided that $3.51 million of ATCO's proposed IT capital expenditure for the fourth access arrangement period can be considered non-conforming under rule 79 of the NGR.

516. Table 33 shows ATCO's proposed IT capital expenditure forecast, and the Authority's approved IT capital expenditure forecast for the fourth access arrangement period.

Table 33 Authority Approved IT Capital Expenditure Forecast (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total Forecast AA4
ATCO Proposed IT Capital Expenditure Forecast	**5.13**	**6.56**	**5.84**	**4.36**	**3.65**	**3.11**	**28.65**
Network Operations						(0.25)	(0.25)
Commercial operations	(0.32)	(0.20)	(0.36)	(0.34)	(0.27)	(0.30)	(1.79)
Business support improvements					(0.33)	(0.37)	(0.70)
Business support upgrades				(0.03)	(0.03)	(0.02)	(0.07)
IT Hardware and Software		(0.20)	(0.20)	(0.10)	(0.10)	(0.10)	(0.70)
Total reductions	(0.32)	(0.40)	(0.56)	(0.47)	(0.73)	(1.03)	(3.51)
Authority Approved IT Capital Expenditure Forecast	**4.80**	**6.16**	**5.28**	**3.89**	**2.92**	**2.08**	**25.14**

Source: ERA, GDS Tariff Model, October 2014.

Overheads

517. ATCO has proposed to include on average 19.6 per cent for overheads in sustaining and growth projects. ATCO's access arrangement information does not provide any detail on which projects contain overhead costs or what the overhead component includes. As a result EMCa's report has not addressed whether this allocation is prudent, efficient or in line with industry practice.

518. The Authority requested an explanation of how overheads in capital expenditure were derived. ATCO explained that a number of network operating and support cost centres, support the capital investment program for sustaining and growth projects. These indirect costs are categorised as overheads and are required to complete the capital projects. ATCO provided a capital expenditure model, which includes an allocation of overheads. ATCO only allocates overheads to sustaining and growth projects using the following bottom up approach:[201]

- each cost centre is reviewed annually to identify the percentage of costs in that cost centre that support the capital program;
- this percentage is then used to calculate the portion of costs that relate to capital projects;
- the sum of all indirect costs is then calculated as a percentage of capital expenditure. This forms our overhead allocation percentage rate.

519. The Authority does not consider that the overhead expenditure is efficient or in line with industry practice. The Authority has reviewed the overhead allocation of other

[201] ATCO Gas Australia, *Email response to ERA25*, 24 July 2014.

gas distribution pipelines in Australia and notes that ATCO's proposed average of 19.6 per cent is higher than its peers.[202] The Authority also notes that the average forecast for overheads for the WAGN 2010 – 2014 access arrangement period was on average 13 per cent.[203] ATCO has not provided any explanation or evidence for the proposed increase in overheads.

520. The Authority does not accept that ATCO's proposed overhead costs meet the requirements of rule 74 of the NGR. The Authority considers that the proposed overheads are too high and therefore are not arrived at on a reasonable basis and the best forecast possible in the circumstances.

521. The AER has approved the following overhead allocations not including IT and SCADA in recent decisions (SP Ausnet 15 per cent, Envestra Victoria 13 per cent and Multinet Victoria 5 per cent). The Authority has reviewed the AER's decisions and considers that an overhead allocation of 15 per cent would be more in line with industry practice. The Authority also notes that an allocation of 15 per cent is higher than the 13 per cent allocation that the Authority approved in the third access arrangement period. The Authority has reduced the relevant capital expenditure asset classes by $10.56 million on a pro rata basis.

Labour escalation

522. ATCO factored into its forecast capital expenditure for the fourth access arrangement period a proposed labour cost escalation factor of two per cent above CPI for each year of the fourth access arrangement period from 2015 onwards.

523. ATCO provided the costs associated with labour cost escalation in Table 11 of its access arrangement information. ATCO has confirmed that the $10.40 million for labour cost escalation includes $1.80 million for labour escalation of direct labour in capital works. ATCO has provided a breakdown of capital expenditure direct labour increase by cost driver.[204]

524. The Authority has decided to reject ATCO's proposed labour cost escalation on the basis of rule 74 of the NGR. The Authority's reasoning and decision is discussed in paragraph 213 of this Draft Decision, which deals with the assessment of operating expenditure. Therefore, the Authority requires ATCO to reduce the relevant capital expenditure asset classes by $1.80 million for labour cost escalation.

525. The Authority's required reduction for overheads and labour escalation is shown in Table 34.

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202 The AER has approved the following overhead allocations not including IT and Scada (SP Ausnet 15 per cent, Envestra Victoria 13 per cent and Multinet Victoria 5 per cent).

203 WAGN, S*ubmission*, 29 January 2010.

204 ATCO Gas Australia, *Email response to ERA27*, 27 July 2014.

Table 34 Authority's Required Reductions for Overheads and Labour Escalation by Asset Class

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total Forecast AA4
High pressure mains - steel	(0.20)	(0.90)	(0.40)	(0.03)	(0.05)	(0.10)	(1.68)
High pressure mains - PE	(0.01)	(0.01)			(0.02)		(0.03)
Medium pressure mains							
Medium/low pressure mains	(0.72)	(1.24)	(0.80)	(0.67)	(0.90)	(0.63)	(4.97)
Low pressure mains							
Regulators	(0.11)	(0.16)	(0.04)	(0.04)	(0.05)	(0.05)	(0.46)
Secondary gate stations			(0.17)	(0.28)	(0.17)	(0.21)	(0.83)
Buildings							
Meter and services pipes	(0.54)	(0.99)	(0.58)	(0.52)	(0.88)	(0.88)	(4.39)
Equipment and vehicles							
Vehicles							
Information technology							
Full retail contestability							
Land							
Authority's required reductions for Overheads and Labour Escalation	**(1.58)**	**(3.30)**	**(1.99)**	**(1.54)**	**(2.07)**	**(1.88)**	**(12.36)**

Source: ERA, GDS Tariff Model, October 2014.

Equity Raising Costs

526. ATCO proposed to include equity raising costs in the revenue modelling for the fourth access arrangement period reflecting the reality that a benchmark firm may wish to raise equity to fund its investment program. However, ATCO has made no provision for equity raising costs during the fourth access arrangement period in the projected RAB.

527. The Authority has not received any submissions on equity raising costs. The Authority agrees that the efficient costs of raising equity may constitute part of the forward-looking costs of providing covered services.

528. The Authority's Rate of Return Guidelines stipulate the methodology for calculating equity raising costs. ATCO's tariff model contained inputs to calculate equity raising costs, which are different to the Authority's inputs in the Rate of Return Guidelines but did not provide any justification for the changes. The Authority reviewed ATCO's inputs but maintains its position as stated in the Rate of Return Guidelines. The Authority considers that the equity share should be maintained at 40 per cent of the estimated asset base, assuming that:[205]

[205] Economic Regulation Authority, *Rate of Return Guidelines*, 16 December 2013, pp. 28-29.

- dividends are paid at a benchmark payout ratio of 70 per cent of after-tax profits – consistent with the Authority's WACC analysis;
- retained earnings of 30 per cent of after-tax profits are available at zero cost;
- 25 per cent of dividends are treated as being reinvested through dividend reinvestment plans on a 'tick the box' basis, with a zero cost of raising equity applied to these funds; and
- 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.

529. The Authority has decided to allow equity raising costs to be added to the capital base. However, no equity raising costs are required using these modelling assumptions.

Required Amendments

530. The Authority does not approve ATCO's proposed capital expenditure for the fourth access arrangement period as submitted.

531. The Authority concludes that:

- $286.44 million (47 per cent of ATCO's proposed capital expenditure) complies with the criteria set out in rule 79 of the NGR, and can be considered conforming capital expenditure for the purposes of rule 78; and
- $320.48 million (53 per cent of ATCO's proposed capital expenditure) does not comply with the criteria set out in rule 79 of the NGR, and cannot be considered conforming capital expenditure for the purposes of rule 78.

532. Table 35 shows ATCO's proposed capital expenditure forecast, and the Authority's required amendments for the fourth access arrangement period by cost driver.

Table 35 Authority Approved Capital Expenditure Forecast by Cost Driver (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total Forecast AA4
ATCO Proposed Capital Expenditure Forecast	**45.31**	**104.46**	**112.64**	**114.62**	**114.03**	**115.87**	**606.92**
Sustaining reductions			(12.12)	(23.69)	(23.90)	(37.69)	(97.39)
Growth reductions	(15.34)	(32.31)	(44.22)	(40.66)	(39.29)	(32.71)	(204.53)
Structures and equipment reductions		(0.50)	(1.18)		(0.40)	(0.60)	(2.68)
IT reductions	(0.32)	(0.40)	(0.56)	(0.47)	(0.73)	(1.03)	(3.51)
Labour escalation reductions	(1.58)	(3.20)	(1.79)	(1.24)	(1.57)	(1.18)	(10.56)
Overhead reductions		(0.10)	(0.20)	(0.30)	(0.50)	(0.70)	(1.80)
Total reductions	(17.25)	(36.51)	(60.07)	(66.35)	(66.39)	(73.91)	(320.48)
Authority Approved Capital Expenditure Forecast	**28.06**	**67.95**	**52.57**	**48.27**	**47.63**	**41.97**	**286.44**

Source: ERA, GDS Tariff Model, October 2014.

533. Table 36 shows the Authority's required amendments for capital expenditure to be included in the projected capital base by asset class.

Table 36 Authority Approved Capital Expenditure Forecast by Asset Class (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total Forecast AA4
High pressure mains - steel	2.42	12.18	8.78	0.66	0.96	1.84	26.85
High pressure mains - PE	0.07	0.13			0.31		0.51
Medium pressure mains	-	-	-	-	-	-	-
Medium/low pressure mains	8.53	16.85	17.65	17.45	16.77	11.69	88.93
Low pressure mains	-	-	-	-	-	-	-
Regulators	1.35	2.12	0.98	0.97	0.97	1.00	7.39
Secondary gate stations	-	-	3.75	7.28	3.20	3.89	18.13
Buildings	1.00	8.95	-	0.43	0.02	0.02	10.41
Meter and services pipes	6.48	13.43	12.68	13.56	16.25	16.28	78.68
Equipment and vehicles	0.65	1.22	1.45	1.29	1.03	0.83	6.45
Vehicles	2.10	1.17	0.82	1.40	4.17	4.03	13.70
Information technology including Telemetry	5.45	7.05	6.45	4.89	3.94	2.40	30.19
Full retail contestability	-	-	-	-	-	-	-
Land	-	4.85	-	0.35	-	-	5.20
Authority Approved Capital Expenditure Forecast	**28.06**	**67.95**	**52.57**	**48.27**	**47.63**	**41.97**	**286.44**

Source: ERA, GDS Tariff Model, October 2014.

Required Amendment 7.

The value of conforming capital expenditure for 2014 to 2019 access arrangement period must be amended to reflect the values shown in Table 36 of this Draft Decision.

Assessment of Depreciation

534. ATCO proposed to change its depreciation methodology in its revised access arrangement information. ATCO is proposing Historic Cost Accounting (HCA) of the Regulatory Asset Base (RAB), with nominal straight line depreciation. Under HCA, the historic cost values are not indexed year to year for inflation. ATCO proposes to phase in the HCA method using a transition approach over a number of access arrangements. This approach contrasts with a Current Cost Accounting (CCA) approach, which has been used for the GDS access arrangements to date.

535. ATCO's proposed depreciation schedule for the fourth access arrangement period will be determined by applying:

- straight-line depreciation to the CCA value of the opening capital base in any year of the period and subtracting an amount to remove the double counting of inflation; and

- straight-line depreciation to the HCA value of all capital additions to occur during the fourth access arrangement period(from 1 July 2014).

536. ATCO's proposed depreciation schedule is discussed further in the Depreciation section in paragraphs 971 to 1055.

537. ATCO's proposed values of depreciation allowances for the fourth access arrangement period by asset class are shown in Table 37.

Table 37 ATCO's Forecast Transition Depreciation (AA4)

Nominal $ million	July to Dec 2014	2015	2016	2017	2018	2019	Total Forecast AA4
High pressure mains - steel	(1.63)	(3.19)	(3.01)	(2.52)	(2.02)	(1.60)	(13.98)
High pressure mains - PE	(0.52)	(0.11)	(0.09)	(0.09)	(0.06)	0.02	(0.85)
Medium pressure mains	(0.07)	0.01	0.11	0.26	0.41	0.58	1.30
Medium/low pressure mains	0.64	1.70	2.34	3.04	3.75	4.51	15.98
Low pressure mains	0.38	0.80	0.85	0.90	0.96	1.02	4.90
Regulators	0.21	0.48	0.58	0.66	0.73	0.80	3.46
Secondary gate stations	0.05	0.11	0.12	0.24	0.45	0.56	1.54
Buildings	0.00	0.07	0.33	0.36	0.39	0.40	1.56
Meter and services pipes	3.39	7.87	9.70	11.56	13.50	15.66	61.67
Equipment and vehicles	0.26	0.61	0.77	0.72	0.87	1.01	4.25
Vehicles	1.26	3.05	3.28	3.28	3.10	2.95	16.91
Information technology	0.90	4.21	5.58	6.55	6.93	6.94	31.11
Full retail contestability	0.00	-	-	-	-	-	0.00
Land	(0.05)	(0.09)	(0.10)	(0.10)	(0.10)	(0.10)	(0.53)
ATCO's Forecast Transition Depreciation	**4.83**	**15.52**	**20.45**	**24.86**	**28.91**	**32.74**	**127.33**

Source: ATCO Gas Australia, Tariff Model, September 2014.

538. ATCO's proposed transition depreciation schedule for the fourth access arrangement period is shown in Table 38.

Table 38 ATCO's Forecast Transition Depreciation Calculation: 2014 to 2019

Transition (Nominal $ million)	July to Dec 2014	2015	2016	2017	2018	2019	Total
Forecast depreciation on opening capital base 1 July 2014							
Straight line depreciation on CCA capital base	17.5	38.05	38.52	38.28	37.71	36.25	206.31
Less: Inflationary Gain	(12.67)	(25.22)	(25.06)	(24.72)	(24.38)	(24.05)	(136.1)
Forecast depreciation on opening capital base 1 July 2014	4.83	12.83	13.46	13.56	13.32	12.20	70.19
Forecast depreciation on forecast capital expenditure (straight line depreciation on HCA capital)	-	2.69	7.00	11.31	15.59	20.54	57.13
ATCO's Proposed Depreciation of Projected Capital Base	**4.83**	**15.52**	**20.45**	**24.86**	**28.91**	**32.74**	**127.33**

Source: ATCO Gas Australia, Tariff Model, September 2014.

539. As discussed above, ATCO has proposed to adopt a transition depreciation schedule. The proposed transition depreciation schedule as shown in Table 39 is determined in two parts.

540. In the first part ATCO applies straight-line depreciation to the CCA value of the opening capital base for existing assets before 1 July 2014. ATCO then subtracts an inflationary gain amount to remove the double counting of inflation in each year.[206] The inflationary gain is a result of Rule 87(4) of the NGR, as it requires the application of a nominal rate of return. This change to a nominal rate of return results in an inflationary gain, when a nominal rate is used to compute the return on the nominal capital base.

541. In order to account for this inflationary gain, ATCO has adopted the AER's Post Tax Revenue Model (PTRM) approach. Under the PTRM, a nominal return is applied to the nominal capital base to derive the inflationary gain amount, which is then subtracted from the depreciation allowance.

542. In the second part ATCO applies straight-line depreciation to the HCA value (Nominal value) of the forecast capital expenditure.

543. The Authority has considered ATCO's proposed transition method in the Depreciation section of this draft decision. The Authority does not approve ATCO's proposed HCA transition approach. The Authority requires that ATCO uses a CCA approach.

544. The Authority notes that a CCA approach may be achieved in a nominal building block model similar to the AER's PTRM approach to depreciation. However, the Authority does not consider that the inflationary gain should be offset from the nominal depreciation as is done in the AER's PTRM approach. The Authority considers that the inflationary gain relates to the return on assets rather than nominal depreciation.

[206] Double counting of inflation is also referred to as an inflationary gain.

The Authority treats the inflationary gain as a separate item in the revenue building block rather than offsetting depreciation or the return on asset.

545. Table 39 sets out the Authority's required depreciation amounts for the fourth access arrangement period, derived using the CCA approach.

Table 39 Authority's Approved Depreciation (AA4)

Nominal $ million	July to Dec 2014	2015	2016	2017	2018	2019	Total Forecast AA4
High pressure mains - steel	1.52	3.14	3.37	3.57	3.66	3.75	19.01
High pressure mains - PE	-	0.00	0.00	0.00	0.00	0.01	0.02
Medium pressure mains	2.75	5.63	5.76	5.89	6.02	6.15	32.20
Medium/low pressure mains	3.30	6.89	7.34	7.82	8.32	8.82	42.49
Low pressure mains	0.66	1.35	1.38	1.41	1.44	1.47	7.69
Regulators	0.37	0.79	0.86	0.91	0.96	1.01	4.89
Secondary gate stations	0.11	0.23	0.24	0.35	0.55	0.66	2.14
Buildings	0.20	0.47	0.72	0.74	0.77	0.78	3.68
Meter and services pipes	6.19	12.92	13.78	14.64	15.56	16.65	79.75
Equipment and vehicles	0.95	2.01	2.18	2.15	2.33	2.50	12.12
Vehicles	-	0.43	0.69	0.88	1.21	2.18	5.41
Information technology	(0.99)	2.37	3.65	4.87	5.97	6.60	22.47
Full retail contestability	0.00	-	-	-	-	-	0.00
Land	-	-	-	-	-	-	-
Authority Approved Capital Expenditure Forecast	**15.06**	**36.23**	**39.98**	**43.22**	**46.80**	**50.58**	**231.87**

Source: ERA, GDS Tariff Model, October 2014.

Assessment of General Method Applied

546. ATCO has calculated the capital base using a roll-forward method, applied in a manner consistent with the method contemplated in the NGR.

547. The Authority has reviewed the calculation methods applied by ATCO in determining the proposed capital base values including the measure of inflation applied.

548. As discussed in paragraph 414, the Authority has revised the opening capital base consistent with rule 74 of the NGR.

549. Table 40 shows the Authority's required amended values in real dollars as at 30 June 2014 – for the value of the capital base for the fourth access arrangement period – taking into account the required amended CPI and amendments to conforming capital expenditure in Table 36.

Table 40 Authority's Approved Projected Capital Base (AA4)

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019
Opening Capital Base	1,008.28	1,021.44	1,054.34	1,069.09	1,077.36	1,082.63
Capital Expenditure	28.06	68.05	52.57	48.27	47.63	41.97
Depreciation	(14.89)	(35.05)	(37.82)	(40.00)	(42.36)	(44.78)
Authority Approved Closing Capital Base	1,021.44	1,054.34	1,069.09	1,077.36	1,082.63	1,079.82

Source: ERA, GDS Tariff Model, October 2014.

550. Table 41 subsequently shows the Authority's required amended values in nominal dollar terms and the inflation adjustment used to calculate total revenue (paragraph 92).

Table 41 Authority's Approved Projected Capital Base (AA4)

Nominal $ million	July to Dec 2014	2015	2016	2017	2018	2019
Opening Capital Base (start of period)	1,008.28	1,032.82	1,089.96	1,129.97	1,164.21	1,196.11
Inflation	11.23	23.14	24.42	25.31	26.08	26.79
Opening Capital Base (end of period)	1,019.51	1,055.95	1,114.38	1,155.28	1,190.29	1,222.91
Capital Expenditure	28.37	70.35	55.56	52.16	52.62	47.41
Depreciation	(15.06)	(36.23)	(39.98)	(43.22)	(46.80)	(50.58)
Authority Approved Closing Capital Base	**1,032.82**	**1,089.96**	**1,129.97**	**1,164.21**	**1,196.11**	**1,219.73**

Source: ERA, GDS Tariff Model, October 2014.

551. The Authority considers that the values for the projected capital base should be those in Table 41 of this Draft Decision. The Opening Capital Base (end of period) values, and the other values set out in Table 41, are derived by indexing the real values in Table 40 to current cost terms, consistent with the rate of inflation as measured by the CPI All Groups, Weighted Average of Eight Capital Cities, as at 31 December in each regulatory year.

Required Amendment 8.

The projected capital base in the proposed access arrangement must be amended to reflect the values in Table 41 of this Draft Decision.

Rate of Return

552. This section considers ATCO's proposals with regard to the rate of return. ATCO has not followed the approach set out in the Rate of Return Guidelines.[207]

553. In general, the Authority has rejected ATCO's proposal to diverge from the Rate of Return Guidelines. However, in response to ATCO's proposal, the Authority has amended its approach to estimating the cost of debt, so that it differs from the approach set out in the Rate of Return Guidelines. With regard to the cost of debt, the Authority has determined to:

- continue to estimate the cost of debt as the sum of the risk free rate, relevant debt risk premium, and relevant debt raising costs;
- continue to estimate the risk free rate from Commonwealth Government Securities with the same term as the regulatory period, that is, 5 years;
- change its approach to estimating the debt risk premium, to now be based on a term of 10 years, which is estimated using an updated bond yield approach that includes international bonds issued by domestic entities;
- continue to apply the annual update for the debt risk premium; and
- change its approach to adjusting revenue for the annual update, by applying the four updated cost of debt changes – to occur for years 2 to 5 of AA4 – once, at the start of the next regulatory period AA5, through a present value neutral adjustment to the AA5 revenue.

554. The reasons for these positions are set out in what follows.

Regulatory Requirements

555. Rule 87 in the NGR sets out the requirements for the rate of return.

556. The overarching objective for the Authority's consideration of the rate of return proposed by ATCO is provided by rule 87(3) of the NGR:

> 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

557. Rule 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:

> 87. Rate of return
>
> …
>
> (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

[207] Economic Regulation Authority, *Rate of Return Guidelines*, 16 December 2013.

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

…

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

…

(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.

558. In addition, rule 87 of the NGR 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 (NGR 87(2));
- subject to the rate of return objective (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));
- results in a return on debt for a regulatory year which contributes to the achievement of the allowed rate of return objective (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 (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) (NGR 87(10)).

ATCO's Proposed Changes

Approach to estimating the rate of return

559. ATCO considers that following the approach in the Rate of Return Guidelines would not result in an overall rate of return that meets the requirements of rule 87 of the NGR. ATCO considers that the approach would not meet the allowed rate of return objective, the National Gas Objective or deliver the requirements of the Revenue and Pricing

Principles.[208] To this end, ATCO notes the reasoning in the expert evidence provided by ATCO's consultants SFG Consulting (**SFG**) and Competition Economics Group (**CEG**).[209] The key points are set out in the relevant sections in what follows.

560. With regard to the Guidelines, ATCO contends that:[210]

> The Guidelines are not mandatory and there is no threshold test that must be met before the Guidelines are departed from. The Guidelines fall away if they do not produce a rate of return which meets the requirements of the Rules. For the reasons stated in this submission the ERA's Guidelines are contrary to Rule 87 and their application would lead to error by the ERA.

Gearing

561. ATCO proposes gearing of 60 per cent debt, consistent with assumptions in the Guidelines. This is unchanged from the arrangements in the third access arrangement for the GDS.

Risk free rate

562. ATCO submits that the risk free rate estimate should be based on Commonwealth Government Securities with a yield to maturity of 10 years, based on an 'on the day', averaging period that is close to the final decision. ATCO's indicative estimate for the purpose of its proposal is 4.06 per cent, which was derived over an averaging period from 22 October to 18 November 2013.

Term of the Risk Free Rate

563. ATCO proposes that where the risk free rate is required as an input, Commonwealth bonds with a yield to maturity of ten years should be used.[211] Its rationale for this proposal is based on the recent determinations of other Australian regulators (Australian Energy Regulator (**AER**) and Independent Pricing and Regulatory Tribunal (**IPART**)), analytical evidence presented in the Rate of Return Guidelines and consultants' advice.

564. ATCO observes that in their recent determinations, the AER and IPART considered various views and determined to adopt a 10 year term to maturity instead of a 5 year term of the risk free rate. ATCO cites these positions in support.

565. With respect to debt management ATCO submitted, on the basis of advice from its consultant CEG, that the use of a 5 year term of debt is not commensurate with efficient

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208 ATCO Gas Australia, *Access Arrangement Information*: 1 July 2014 – 31 December 2019, 3 April 2014, p. 230.

209 ATCO Gas Australia, *Access Arrangement Information*: 1 July 2014 – 31 December 2019, 3 April 2014, Appendices 19 and 20.

210 ATCO Gas Australia, *Access Arrangement Information*: 1 July 2014 – 31 December 2019, 3 April 2014, p. 230.

211 ATCO Gas Australia, *Access Arrangement Information* 1 July 2014 – 31 December 2019, 17 March 2014, p. 238.

debt financing costs. CEG characterised as flawed the Authority's view that its cost of debt allowance promotes economic efficiency.[212]

566. ATCO is of the view that the common practice of energy network businesses – of issuing debt in excess of ten years – is an efficient practice that lowers overall finance costs. Its consultant CEG reported a range of evidence suggesting that the dominant financing strategy reflected a tenor of debt at the time of issuance in excess of ten years. This evidence included its own 2013 report on debt strategies of utility businesses, the 2013 report by Price Waterhouse Coopers on the benchmark term of debt assumption for Energy Networks Australia and the Authority's analysis in the Explanatory Statement for the Rate of Return Guidelines.[213] CEG considers that this dominant financing strategy reflects an attempt by firms to minimise transaction costs and risks that arise from market imperfections.[214]

567. ATCO disagrees with the Authority's interpretation of the term of the risk free rate in Lally's 2010 report on the Queensland Competition Authority's weighted average cost of capital. On the basis of CEG's advice, it proposes that the term of the risk free rate referred to by Lally is the term of debt at issuance, rather than the average residual term to maturity.[215] ATCO makes reference to a worked example by CEG illustrating that the change in yield in the secondary market based on the remaining term of debt is irrelevant to the cost of debt incurred by the issuer. Additionally, ATCO highlighted the analysis of the AER – which outlined that the term premium is not forgone with the passage of time – to support its position.[216]

Return on equity

568. ATCO did not adopt the approach to estimating the return on equity that was set out in the Rate of Return Guidelines.

569. ATCO submits that:[217]

> The approach in the Guidelines for the return on equity does not consider all relevant methods, models, data and other evidence and instead relies only on the Sharpe Lintner CAPM. In applying the chosen model, the Guidelines do not use the best estimate of the relevant parameters. The Guidelines also do not provide effective consideration of the estimate of the return on equity and debt against the ARORO, the NGO or the RPP.

570. ATCO and its consultant SFG Consulting consider that it was the Australian Energy Market Commission's (**AEMC**) clear intention – in amending NGR 87 – to alter the practice of regulators relying exclusively on the Sharpe Lintner CAPM for setting the

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212 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 20, pp. 2-3.

213 Competition Economists Group 2013, *Debt strategies of utility businesses*, June 2013.

Energy Networks Association 2013, *Benchmark term of debt assumption,* June 2013.

Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013.

214 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, pp. 17-18.

215 Ibid, p. 65.

216 Australian Energy Regulator, *Explanatory Statement: Rate of Return Guideline*, December 2013, p. 147.

217 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December* 2019, 3 April 2014, p. 230.

return on equity. In this context, ATCO quotes the AEMC's consideration that no one method can be relied on in isolation.[218]

571. ATCO's consultant SFG considers that this view underpinned the new NGR 87(5), and in particular the requirement that regard must be had to relevant estimation methods, financial models, market data and other evidence.[219] ATCO's consultant SFG Consulting provides the following interpretation of the word 'relevant', as being consistent with the ordinary usage of the word:[220]

> We consider a model to provide relevant evidence if it can, in any meaningful way, inform the estimate of the required return on equity. We do not require that a model must be capable of achieving the allowed rate of return objective to be considered to be relevant. Moreover, the ERA appears to have concluded that the DGM is irrelevant because it cannot, by itself, achieve the allowed rate of return objective. In our view, this test would rule out every model because none is individually capable of achieving the allowed rate of return objective…

572. SFG viewed the Authority's use of the Sharpe-Lintner CAPM in combination with other relevant data to inform the estimate for the return on equity as exclusive, unnecessarily convoluted, without precedence or rationale and inherently internally inconsistent.[221] SFG saw the Authority's criteria as a means by which it excluded the Fama French model as irrelevant on the basis that it was not the 'best' model. Additionally, it highlighted that the Authority's criteria are not part of the National Gas Rules.[222]

573. ATCO in its proposal departed from the Rate of Return Guidelines.[223] ATCO submits that it has:

> …taken into account a large amount of information relevant in estimating the return on equity. This information includes estimates from other relevant models, independent expert valuation reports, Wright approach, evidence considered by other Australian regulators, relationship between book to market stock returns and the term of the risk free rate. [224]

Step 1 – Relevant materials

574. ATCO considers that in addition to the Sharpe Lintner CAPM, the Fama-French model is a relevant model for estimating the return on equity, arguing that it satisfies the Authority's criteria at least as well as the Sharpe Lintner CAPM.

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218 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 229.

219 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 3.

220 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 27.

221 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 76.

222 Ibid, p. 4.

223 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 230.

224 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 237.

575. ATCO's consultant SFG contends that the Fama-French model is relevant for meeting the allowed rate of return objective as it:

- is driven by economic principles:[225]
  - the model, despite having origins in empirical analysis, is now structured as a risk factor model within the context of Arbitrage Pricing Theory;
  - the model allows risks other than systematic risks to be priced, where the risk factors proxy for the risks of financial distress, asymmetric exposure to market conditions and arbitrage risk:

    The extensive set of perfect market assumptions that are required for the Sharpe-Lintner CAPM to hold, and which do not hold in the real world because of market imperfections, have two important implications. First, in a world with real market imperfections, in general, risks other than market risk will be priced. Second, the simple relationship between mean return and market beta will no longer hold. In short, in real-world markets, multiple risks are likely to be reflected in asset prices, and the empirical evidence suggests that the SMB and HML factors are the best available proxies for those risks.
- is fit for purpose:[226]
  - SFG considers that the Brailsford, Gaunt and O'Brien update in 2012 – which was based on a new and specially constructed dataset that provides coverage of over 98 per cent of firms over the 25 year period 1982-2006 – removes any concerns as to the robustness of the Fama French model within an Australian context;
  - SFG endorses the view that the revised results support a positive value premium in the Australian context, while the insignificant size premium is consistent with the trend in results from the use of the model overseas;
  - the use of the model has become standard practice in the finance literature, including in A rated journals, either as a three factor model, or augmented with additional factors, and is taught in most finance courses;
- supported by robust, transparent and replicable analysis that is derived from available, credible datasets:[227]
  - SFG considers that the 2012 Brailsford et al study meets this criterion;
- supportive of specific regulatory aims:[228]
  - SFG contends that the Fama French model is not overly complex;

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225 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 18.

226 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 20.

227 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 23.

228 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 24.

– SFG endorses the 2012 Brailsford et al study's findings that 'the three factor model is found to be consistently superior to the CAPM'.[229]

576. ATCO's consultant SFG considers that the Sharpe Lintner CAPM model would fail to meet the allowed rate of return objective as, among other things:[230]

- the model is a special case of the Fama-French model (albeit with size and value premiums set to zero), giving an outcome that is at odds with the observable data;
- the model does not fit the data – studies such as those by NERA in 2013 suggest that there is no discernible relationship between beta and stock returns, but rather that the relationship is random;[231]

  The argument that is typically raised in response to such evidence centres on explaining why the poor empirical performance does not disprove the Sharpe Lintner CAPM as a theoretical model.[232] In particular, under the assumptions of the Sharpe Lintner CAPM, a linear relationship must exist between the expected returns of individual firms and the expected return on an ex ante efficient (market) portfolio. Standard mathematics proves that such a relationship will always exist, under the assumptions of the Sharpe Lintner CAPM. However, the problem is that the assumptions of the Sharpe Lintner CAPM do not hold in reality and the market portfolio that the ERA uses need not be ex ante efficient. In this case, there need be no linear relationship between beta and required returns.

- the model fails to meet the test of being 'capable of reflecting changes in market conditions and able to incorporate new information as it becomes available', as for example occurred during the global financial crisis.

577. ATCO considers that in addition to the Sharpe Lintner CAPM and the Fama-French model, the Dividend Growth Model (**DGM**) is a relevant model for estimating returns of the benchmark efficient firm itself, rather than just as a means to inform the MRP.[233] ATCO's consultant SFG contends that:[234]

- the Authority itself considers the DGM relevant when populated with market wide inputs, as it is used for the purposes of informing the MRP;
- it is not appropriate to compare forecast dividend streams and actual dividend streams as a source of bias, the relevant comparison is between the dividend stream forecasted by analysts and the dividend stream that is reflected in the current stock price – only if these diverge is there bias in the discount rate:

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229 Brailsford T., J. Handley and K. Maheswaran, The historical equity risk premium in Australia Post-GFC and 128 years of data, *Accounting and Finance*, 2012, pp. 237 – 247.

230 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 24.

231 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 25.

232 See for example Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 8, paragraph 26.

233 ATCO Gas Australia, Access Arrangement Information: 1 July 2014 – 31 December 2019, 3 April 2014, pp. 236-7.

234 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, pp. 26 - 27.

Fitzgerald, Gray, Hall and Jeyaraj (2013)[235] consider the correct comparison (between the dividend stream forecasted by analysts and the dividend stream that is reflected in the current stock price) and develop a DGM methodology to mitigate any bias that may exist. They do this by comparing the earnings and dividend forecasts of each analyst with their own target price for each stock. Presumably, each analyst will have used their own forecasts when determining their target price. They conclude that "there is no reliable evidence that earnings projections have more of an upward bias than target prices,"[236] which would seem to entirely address the ERA's concern on this point.[237]

- the Authority's version of the DGM does not require dividend forecasts at all;
- the only rationale for not adopting the DGM at the firm level is that the comparable firm input data is materially less reliable than the market wide data.

578. ATCO considers that in addition to the Sharpe Lintner CAPM, the Fama-French model, and the DGM model, the required return for the average firm on the market is also relevant for informing the return on equity for the benchmark efficient firm. ATCO's consultant SFG contends that the return for the average firm on the market is relevant as:[238]

- asset pricing models all begin with such an estimate and then make adjustments for the extent to which the firm in question is considered to be different from the average firm;
- there is debate in the literature as to which factors to adjust;
  - for a regulated firm, there is no a-priori reason to expect that the required return would be higher or lower than the average firm; and
  - some factors suggest a lower than average required return (asset beta) whereas others suggest a higher than average return (leverage, book to market premium);
- if the task is to estimate the required return on equity for the benchmark efficient firm, an estimate of the required return on the average firm must be relevant evidence as a point of comparison, particularly as:
  - the Authority has indicated as it considers its estimate of the required return on equity for the average firm is likely to be materially more reliable than its estimate of the required return on equity for the benchmark efficient entity; and

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235 Fitzgerald T., S. Gray, J. Hall, R. Jeyaraj, Unconstrained estimates of the equity risk premium, *Review of Accounting Studies*, 18, 2013, pp. 560 - 639.

236 Ibid, p. 563.

237 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 8, footnote 153, p. 77. The footnote states:

For a summary of work on broker bias, see SFG Consulting, *The required return on equity commensurate with current conditions in the market for funds*, Report prepared for WA Gas Networks, 2010, p. 18. With regard to this report, the Authority notes that it does not consider that using broker target stock prices will necessarily offset broker bias with regard to dividend cash flows. SFG Consulting make this claim but provide no supporting evidence. It is not clear to the Authority as to whether the bias applies equally to dividends or target stock price. It is possible that the bias applies only to dividends, and hence the return on equity.

238 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, pp. 28 - 29.

– the estimate for the average firm does not require the estimation of beta or any other factor sensitivity parameters which are particularly contentious and prone to estimation error.

Step 2 – Estimate parameters for the relevant models

579. ATCO submits that the Authority's approach to estimating the return on equity does not adopt the best estimates for the parameters in the Sharpe Lintner CAPM.[239]

580. First, ATCO considers that investors assess returns relative to the yield on ten year government bonds rather than five year government bonds.[240] As noted above at paragraph 564, ATCO cites the views of the AER, which has adopted the ten year term for input to the Sharpe Lintner CAPM, and IPART, which has also recently chosen to depart from the five year term for the risk free rate. ATCO considers that the use of a five year term will significantly understate the return on equity, particularly given the evidence that firms issue debt with an average tenor of ten years. ATCO argues that where the risk free rate is required, Commonwealth bonds with a yield to maturity of ten years should be used.[241]

581. Second, with regard to the MRP, ATCO considers that the Authority's range – of 5 to 7.5 per cent – has been incorrectly established. In addition, ATCO considers that there is no justification for choosing a point estimate below the midpoint of the range. ATCO also contends that the Authority assumes 'that there is no inverse relationship between the MRP and risk free rate as accepted and demonstrated by other methods and models'.[242]

582. ATCO considers a range of information for estimating the MRP:[243]

> ATCO Gas Australia notes the SL CAPM requires the MRP to be the difference between the required return on the market and the risk free rate. Estimating the MRP parameter is a widely debated topic due to its disputed relationship with movements in the risk free rate. Therefore, instead of specifically estimating the MRP parameter, ATCO Gas Australia proposes to use all relevant information to estimate the required return on the average firm that is consistent with the prevailing conditions in the market. This material is considered relevant as all asset pricing models begin with an estimate of the required return on the market and then make adjustments for the extent to which the firm in question is considered to be different from the average firm. Further, it allows both theories relating to the relationship between the MRP and risk free rate to be taken into account.
>
> In order to estimate the required return on equity for the market ATCO Gas Australia has considered four approaches:

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239 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 234.

240 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 237.

241 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 238.

242 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 240.

243 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 240.

- Dividend growth model estimate of the contemporaneous required return on the market of 11.3%
- Wright approach estimate of the required return on the market of 11.7%
- Ibbotson approach estimate of the required return on the market of 10.6%
- Survey evidence from independent valuation experts resulting in a with-imputation estimate of 11.3%

583. ATCO equally weights the four approaches to propose a return on equity *for the market* of 11.2 per cent.[244]

584. ATCO then applies an estimate of the 10 year risk free rate on Commonwealth Government Securities, of 4.06 per cent, to back out an implied MRP of 7.1 per cent.

585. Third, with regard to the equity beta, ATCO notes the adoption by the Authority of the value of 0.7 from within the estimated range for the benchmark efficient entity of 0.5 to 0.7. ATCO considers that the Authority should undertake cross checks of the equity beta. ATCO notes that a value of 0.7 for the equity beta is a reduction in the beta from the current access arrangement of 0.8. ATCO submits that risk has increased over time, rather than declined, as a 'result of declining average consumption, policy positions that encourage the use of PV cells with continued electricity price subsidies and the regulations in the building industry which increase barriers to gas use'. ATCO submits an estimate of 0.82 for the equity beta, derived from a weighted average of observed betas for Australian comparators and United States comparators, is a better estimate.[245]

586. ATCO's consultant, SFG, states the following:[246]

> The ERA has provided no basis for why it has constrained the range to 0.5-0.7, nor even explained what the range means. It is not a confidence interval, it is not the minimum-to maximum, it appears to be an arbitrarily selected band. But the selection of this range is very important because the final value of equity beta is constrained to come from within this range-regardless of any other relevant evidence to the contrary.

587. SFG continues by noting that:

> The Estimates on which the ERA has relied vary alarmingly depending on the methodological choices of regression technique and sampling period.

588. SFG notes regression based estimates for Hastings Diversified Fund (**HDF**) vary based on both the sampling period and regression estimator employed. In addition, SFG notes that the average estimate of firm betas estimated by the Authority between the 2011 and 2013 analysis have diverged, noting in particular that Envestra's equity beta estimate has increased by 20 per cent, whilst DUET's equity beta has decreased by 25 per cent. SFG suggests that either the systematic risk of the firms in the benchmark sample have materially changed over the two year period between 2011 and 2013, or that this is evidence that the equity beta estimates are unreliable. SFG reproduces its own evidence and that of CEG,[247] which shows that the equity beta

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[244] ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 241.

[245] ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 239.

[246] Strategic Finance Consulting, *Estimating the Required Return on Equity for ATCO Gas Australia*, March 2014, p. 71.

[247] Competition Economists Group, *Regression estimates of equity beta,* September 2013.

estimate can fluctuate based on the day of the week chosen to calculate returns, or the sampling interval. SFG concludes by noting that:

> In our view, the wide variation in returns – caused by nothing more than changing the day of the week (or month) from which returns are measured – is evidence of a lack of reliability. This provides further evidence that adopting a narrow range of 0.5 to 0.7 for equity beta unreasonably restricts the relevance that other information can have in reaching a final decision on equity.

589. In addition, SFG restates its opinion that international evidence regarding the equity beta of US firms is relevant for informing the equity beta of the benchmark efficient entity. SFG considers that the foreign comparable companies are relevant and should be included in the benchmark sample in order to alleviate the issues outlined above. SFG restates the arguments presented in its 2013 submission to the Rate of Return Guidelines.[248]

590. SFG also notes that both the AER and Authority propose using evidence from the Black CAPM to select a point estimate at the upper end of the estimated range, resulting in a point estimate of 0.7 for equity beta. SFG submits that the only evidence regarding the Black CAPM considered by the Authority is that produced by NERA (2013), who estimated a Black CAPM beta of 1.0.[249]

591. SFG also considers that the Authority has provided no explanation in the Rate of Return Guidelines for why it considers the systematic risk of the ATCO distribution network has fallen, given that the previous access arrangement adopted an equity beta of 0.8. SFG questions whether the systematic risk of a gas distribution business has declined over the life of the access arrangement, or if the previous beta value resulted in an over-investment in the ATCO distribution network.

Step 3 – Estimate the return on equity

592. ATCO does not agree with the rationale for excluding other relevant cost of equity models from consideration and therefore does not agree that the estimate produced from the Sharpe Lintner CAPM model should effectively be afforded 100 per cent weighting.[250] ATCO proposes instead to estimate the return on equity *for the benchmark efficient entity* as a simple average of estimates from the four models it considers relevant:

- the required return of the average firm - 11.2 per cent;
- the Sharpe Lintner CAPM – 9.9 per cent;
- the Fama-French model – 10.8 per cent;
- the DGM estimate for the benchmark efficient entity – 10.9 per cent.

593. On this basis, ATCO proposes a return on equity of 10.7 per cent.

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248 Strategic Finance Consulting, *Regression-based estimates of risk parameters for the benchmark firm, Report for Energy Networks Association*, June 2013.

249 NERA, *Estimates of the Zero-Beta Premium*, June 2013.

250 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 241.

Step 4 – Consider other relevant material

594. ATCO submits that:

- The Authority's approach would lead to a return on equity that is considerably lower than that proposed for ATCO Gas (Canada), a gas distribution network in the recent 2014 filing with the Alberta Utilities Commission of a return on equity of 11.25 per cent;[251]
- The Authority's process results in all other relevant information having no effective influence on the estimate and the estimate is not considered against the ARORO;[252]
- The resulting estimate does not achieve the allowed rate of return objective and is not sufficient to allow ATCO Gas Australia to attract funds from capital markets, within the ATCO Group or from like businesses in other states.[253]

595. ATCO suggests that the Authority has not applied the data and evidence listed in Appendix 29 of the Explanatory Statement to the Rate of Return Guidelines. ATCO submits that:[254]

> …the items set out in this appendix do not appear to be cross checks which the ERA has applied to the return on equity estimate. The material set out in that appendix is either:
>
> - not used at all
> - used to inform the estimate of individual parameters rather than the estimate of the return on equity
> - has no material effect on the estimate of the allowed return on equity.

596. ATCO observes that estimates from other models, or made by the Authority at a different time, are all higher than the indicative estimate set out in Appendix 30 of the Rate of Return Guidelines (Figure 24).

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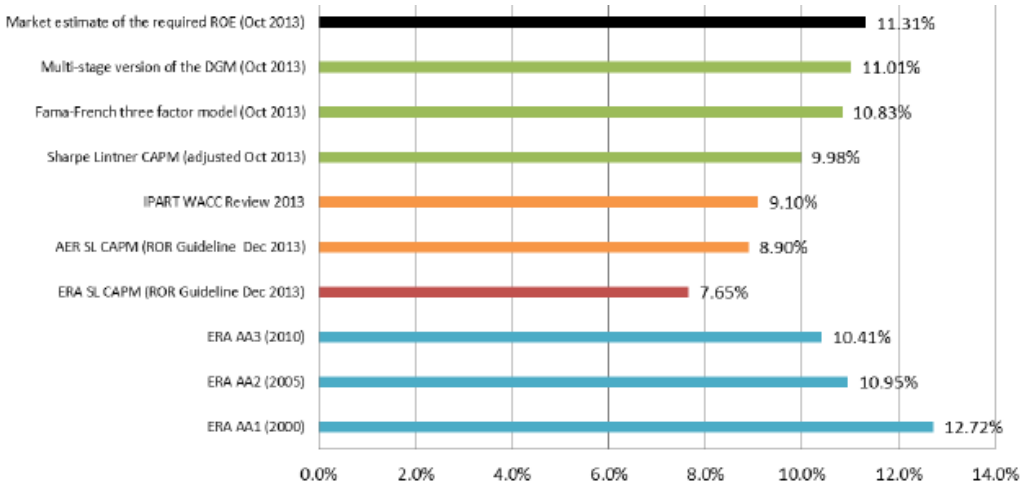
251 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 233.

252 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 234.

253 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 234.

254 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 241.

Figure 24 ATCO's comparison of the return on equity



Source: ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 242.

Cost of debt

597. ATCO did not adopt the approach to estimating the return on debt using the Authority's Bond yield approach that was set out in the Rate of Return Guidelines.

598. ATCO submitted that the approach set in the Guidelines does not result in an estimate of a return on debt that achieves the ARORO or complies with the NGR because the ERA's approach:[255]

- is not consistent with an implementable efficient debt management strategy;
- is based on a term of debt that is not efficient and results in an under-estimation of the cost of debt;
- introduces additional requirements for an annual update that has no other effect than to increase the risk faced by the business with no additional compensation; and
- results in an estimate that does not provide an opportunity to recover the efficient costs of debt.

The term of the cost of debt

599. As noted at paragraph 567, ATCO is of the view that the term for the cost of debt should be 10 years.

Credit rating

600. ATCO Gas Australia noted that the benchmark credit rating established in the Authority's Rate of Return Guidelines was derived from the ratings of Australian

[255] ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 249.

Electricity and Gas network service providers. It accepts that the credit rating established in the Rate of Return Guidelines sits within the BBB band.[256]

Estimating the debt risk premium

601. ATCO submitted that the Authority's bond yield approach should not be used to estimate the debt risk premium because of the following two limitations.

602. First, ATCO objected to the benchmark sample that is adopted under the bond yield approach. ATCO submitted that the Authority's criteria in selecting bonds for the sample are unnecessarily restrictive, particularly in relation to the exclusion of bonds issued by Australian entities overseas. ATCO argued that issuing bonds overseas is a common practice for regulated Australian utilities, particularly with regard to long term debt. Based on CEG's advice, ATCO estimates that foreign currency bonds account for close to half of all bonds issued by Australian regulated energy utilities. ATCO contends that this implies that the benchmark sample should include these foreign bonds, so as to reflect the actual debt management practices of regulated energy utilities.

603. Second, ATCO also argued that because the term of debt under the Authority's bond yield approach will vary from year to year depending on the vagaries of the maturities of the bonds in the benchmark sample, this makes it impossible for an entity to have a debt management strategy consistent with the Authority's benchmark.[257]

604. ATCO noted the Reserve Bank of Australia (**RBA**) began publishing credit spreads for Australian non-financial corporations in December 2013. Credit spread data provides information on bond market conditions which can be used to estimate the debt risk premium. The credit spreads produced by the RBA include those within the A and BBB bands across maturities ranging from one to ten years.

605. ATCO submitted that the methodology behind the RBA's estimates is transparent, well documented and repeatable. ATCO submits the RBA data is relevant and the best source to use for estimating the cost of debt.[258] Therefore, ATCO submitted the RBA corporate credit spread data represents the best method by which to estimate the cost of debt.[259]

606. In summary, ATCO submitted the best estimate of the cost of debt is one based on the RBA's Australian corporate credit spreads for BBB rated ten year Australian corporate debt.[260]

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256 ATCO Gas Australia, *Access Arrangement Information 1 July 2014 – 31 December 2019*, 17 March 2014, p. 232.

257 Competition Economists Group, 2014, *Cost of debt consistent with the NGR and NGL,* a report prepared for ATCO Gas Australia, p. 50.

258 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 252.

259 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 252.

260 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 255.

Annual update of the debt risk premium

607. ATCO submitted that the annual update of the debt risk premium does not represent an efficient debt management strategy because it introduces:

- additional risks and costs that cannot be managed and would require additional compensation, increasing costs to customers; and
- price volatility for customers.

608. In addition, ATCO submitted that an annual update to the cost of debt does not represent an efficient practice that a benchmark firm would undertake as a part of normal business practice. By implementing an annual update, and essentially forcing businesses to refinance annually, the Authority would be imposing an inefficient practice upon network service providers. Such a practice would incur significant costs, which would be in addition to the debt issuance and hedging costs recognised by the Authority.[261]

609. ATCO's consultant, CEG, submitted that a benchmark efficient debt management strategy should satisfy the following five criteria:[262]

- the strategy must be feasible for a business to implement;
- implementation of the strategy involves low transaction costs for the business;
- it minimises the prospect and consequences of estimation error;
- it gives rise to relatively low price volatility for customers; and
- the benchmark debt management strategy should reflect the standard practice of businesses operating in similar environments to network energy businesses.

610. CEG considers that the inability to hedge the DRP means that, under any financing strategy, the DRP that is incurred when a bond is issued is fixed until the maturity of that bond. CEG concluded that there is no way for an efficient benchmark entity or the actual service provider to implement a benchmark efficient debt management strategy that would have the DRP on pre-existing debt reset every year at prevailing DRP rates.[263] CEG also argued that the only circumstance in which an entity could align the DRP it pays with the Authority's annual update to the DRP is if the entity relies solely on one year maturity debt (i.e. rolls over 100 per cent of its debt each year).[264]

611. In summary, ATCO submitted that the cost of debt should be determined once and the estimate is then applied to the entire regulatory period of five years without any annual updating.

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261 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 254.

262 Competition Economists Group, 2014, *Cost of debt consistent with the NGR and NGL,* a report prepared for ATCO Gas Australia, p. 32.

263 Competition Economists Group, 2014, *Cost of debt consistent with the NGR and NGL,* a report prepared for ATCO Gas Australia, p. 22.

264 Competition Economists Group, 2014, *Cost of debt consistent with the NGR and NGL,* a report prepared for ATCO Gas Australia, p. 23.

Averaging period for market based parameters

612. For the purpose of calculating the rate of return for its access arrangement proposal, ATCO adopted a 20 business day averaging period commencing on 22 October 2013 and ending on 18 November 2013. ATCO states that it adopted an averaging period of 20 days for practical reasons given the short amount of time between the publishing of the Rate of Return Guidelines and the submission date.

613. ATCO considers the adoption of a 20 day period or the 40 day period immaterial to the outcome for the rate of return.[265]

614. ATCO proposes to lodge a separate and confidential request with the Authority to agree, prior to the final decision, the averaging period for market based parameters that will be adopted to apply for the final decision. This averaging period will be in respect of the calculation of the return on debt and the parameters used to populate the relevant cost of equity models, which are used to derive the cost of equity proposal. ATCO expects that this date will remain confidential until the Authority delivers its final decision, consistent with prior practice.[266]

Debt and equity raising costs

615. Debt issuance and hedging costs are transaction costs incurred each time debt is raised or refinanced. Debt raising costs may include underwriting fees, legal fees, company credit rating fees and other transaction costs.

616. ATCO proposes to include equity raising costs in revenue modelling for AA4.[267]

617. ATCO proposes to incorporate an allowance of 0.125 per cent being incorporated into the cost of debt, consistent with the Rate of Return Guidelines. ATCO also proposes to incorporate a hedging allowance of 0.025 per cent into the cost of debt estimate. This allowance acknowledges the need to hedge exposure to movements of the risk free rate and is consistent with the Guidelines.[268]

Proposed rate of return

618. In summary, ATCO propose a rate of return for the benchmark efficient entity of 8.53 per cent, comprising:

- gearing of 60 per cent;
- a return on equity of 10.7 per cent;
- a cost of debt of 7.09 per cent.

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265 ATCO Gas Australia, *Access Arrangement Information 1 July 2014 – 31 December 2019*, 17 March 2014, p. 232.

266 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 232.

267 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 259.

268 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 256.

Submissions

619. Two submissions were received on ATCO's proposal.

Risk free rate

620. Alinta Energy highlighted that ATCO has departed from the Authority's Rate of Return Guidelines in relation to the estimation of the cost of debt, specifically that:

> ATCO does not believe that the adoption of a five year term for debt does not [sic] provide an opportunity to recover efficient costs and an annual update to the debt risk premium would introduce additional risks.

621. On this point, Alinta Energy submitted that it is important to consider the impact on end users. Its concerns in relation to this point, however, were purely aimed at the annual updating of the debt risk premium which is addressed at paragraph 897.

Return on equity

622. Kleenheat in its submission broadly supports the approach in the Rate of Return Guidelines, including the use of the Sharpe Lintner CAPM for the estimate of the return on equity. Kleenheat is of the view that the proposed MRP is too high, and does not believe that the use of international betas is appropriate in the Australian context.[269]

Cost of debt

623. Kleenheat submitted that it supports ATCO's submission that the annual reset of the DRP will introduce volatility in tariff prices. Kleenheat argued that this annual update of the DRP will create a significant risk for Kleenheat and its customers as it creates a more challenging operating environment for capital budgeting and financing. As such, Kleenheat submitted that it supports a proposal that does not apply annual updates to the DRP.[270]

624. Alinta Energy submitted that greater volatility in the debt risk premium [by updating annually] will flow through to end use customers via higher and potentially more volatile prices. Alinta Energy argued that it is not in the best interests of end use customers to be subject to tariffs that vary significantly year on year. Without certainty, the only way to manage this risk is by passing it on to customers via higher overall energy prices.[271]

625. Given the significant value that investors and end use customers place on price certainty, Alinta Energy considered that the Authority should permit the fixing of the debt risk premium for a longer period to allow certainty for investors and consumers and ensure continual investment in the network.[272]

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269 Kleenheat Gas, *Submission on the Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014, p. 2.

270 Kleenheat Gas, *Submission on the Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014.

271 Alinta Energy, *Submission in response to the Issues Paper on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014, p. 6.

272 Alinta Energy, *Submission in response to the Issues Paper on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014, p. 6.

Considerations of the Authority

626. The Authority notes ATCO's view that the approach set out in the Rate of Return Guidelines would not result in an overall rate of return that meets the requirements of rule 87 of the NGR, the National Gas Objective or deliver the requirements of the Revenue and Pricing Principles.[273] As these views relate to the construction of the rate of return, the key points are addressed in relevant sections in what follows.

Gearing

627. The Authority accepts ATCO's proposed gearing of 60 per cent debt, as it is consistent with assumptions in the Guidelines.

Risk free rate

628. The Authority's views on this matter – including extensive reference to theoretical support for aligning the term of the risk free rate with that of the regulatory period – were set out in detail in the Rate of Return Guidelines.[274]

629. The Authority therefore does not accept ATCO's proposal to use a 10 year term for the risk free rate.

Term for the risk free rate for the return on equity

630. The rate of return on equity for any investment should correspond to the period over which the cash flows are expected in relation to the invested assets. It follows that the same period should be used to inform the term of the risk free rate and the equity risk premium.[275]

631. In this context, the Authority notes that the value of the regulatory asset base, the risk free component of the return on equity, and the equity risk premium are set at the start of each regulatory period. This provides relative certainty with regard to the related earnings cash flow over the regulatory period, all other things equal.[276]

632. Therefore, the Authority is of the view that the use of a 5 year term for the return on equity more appropriately reflects the relevant investment horizon for the regulated business, rather than a period which approximates the longer term to perpetuity (such as a period of 10 years or more).[277]

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273 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 230.

274 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 2, p. 29.

275 S. Pratt and R. Grabowski, *Cost of Capital: Applications and Examples*, 4th edition, 2010, p. 119.

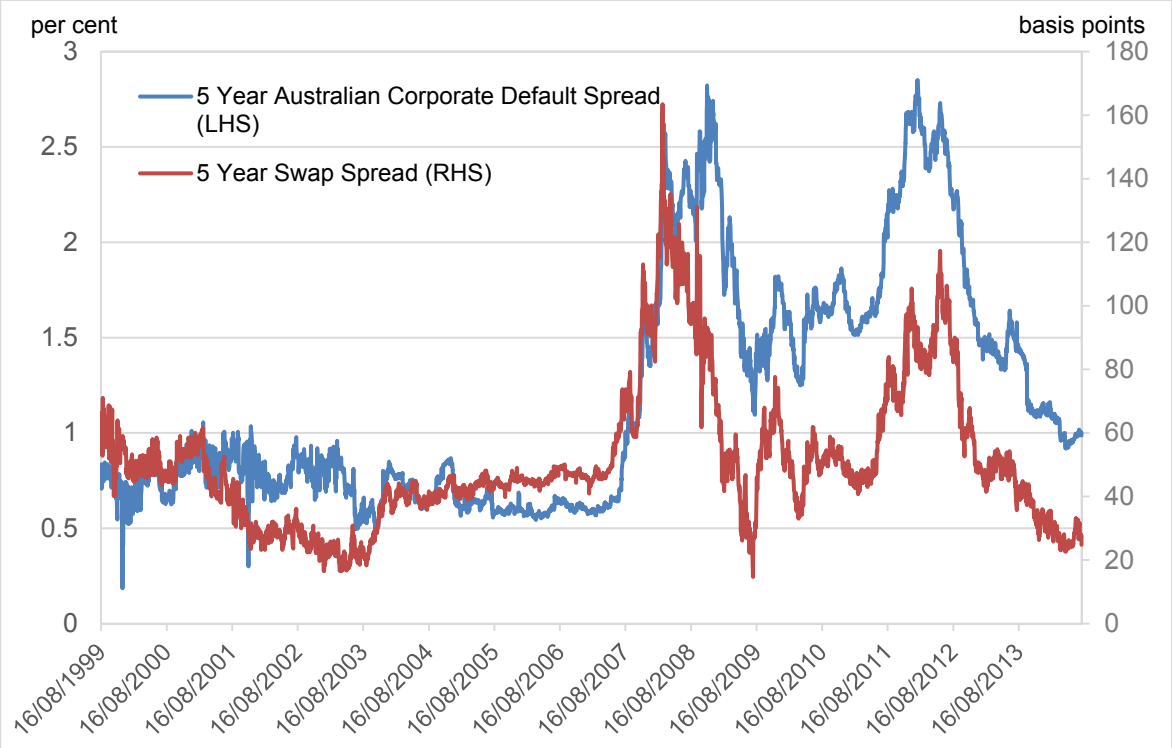
276 The relatively high degree of certainty for regulated firms is in comparison to cash flows under an unregulated regime – subject to competitive pressure – where there is both price and quantity demand risks. Hence, there is no certainty with regard to cash flows over the next five years.

277 For the purpose of valuation of the firm, it may be appropriate to discount subsequent expected cashflows from the sixth year as a perpetual annuity, similar to any other asset. From that point, equity analysts seeking to value the firm would apply a long term forward looking return on equity to arrive at the value of the perpetual annuity, to the start of the sixth year. The present value of the first five years cashflow, and the value of the firm at the start of the sixth year, would be discounted using the five year rate to arrive at the present value of the firm.

633. It is not appropriate to automatically apply the perpetual forward looking return on equity over the regulatory period, as the five year forward looking rate and perpetual rate are not the same. This is because an investor's outlook on market conditions over any forthcoming 5 year period is unlikely to be the same as their outlook over a perpetual horizon, particularly when the corresponding perpetual outlook relates to the period starting in 5 years time.

634. For example, the forward looking 5 year period in late 2008 indicates that an investors' outlook on market conditions and risk they faced at that point was atypical (Figure 25). As a result, the return on equity required in the 5 year period commencing in late 2008 clearly was quite different from the subsequent required return on equity, taken from a later point, such as 2013.

Figure 25 5 year forward looking Indicators of expected risk spreads



Source: Bloomberg, ERA Analysis

635. This example is analogous to a two stage dividend growth model, where the dividend growth rate is known with certainty up until the next access arrangement in the first stage. The second stage is the period from the next access arrangement to perpetuity.

636. The Authority notes that ATCO cite as support the recent determination by the AER and IPART which adopt a 10 year term to maturity instead of a 5 year term on the risk free rate.

637. First, the AER considers that it is appropriate for the term of the risk free rate to be based on the long term, due to the potentially infinite series of cash flows associated with any investment. The AER notes that the opinions of experts are mixed:

> … Pratt and Grabowski (2010) and Damodaran (2008) both propose that, in general, an equity investment in an ongoing business is long term. They suggest, therefore, that for an ongoing business, the term of the equity should be measured as the duration of the long-term—and potentially infinite—series of cash flows. Both conclude that it is appropriate to use long term government bonds to estimate the return on equity, with

Damodaran suggesting that 10 years is generally appropriate. Alternatively, Lally (2012) argues that a five year term is consistent with the present value principle—that the net present value (NPV) of cash flows should equal the purchase price of the investment. Lally stated that the present value principle is approximately satisfied only if the term of equity matches the regulatory control period.[278]

638. The AER concluded:[279]

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

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

639. Second, IPART concluded that a 10 year term is more consistent with a weighted average cost of capital (**WACC**) that reflects efficient financing costs of a benchmark entity operating in a competitive market. In particular, it agreed with Sydney Desalination Plant Pty Limited's submission that Professor Davis' NPV neutrality argument was only consistent with a WACC methodology comprised of parameters based on short term historical estimates. IPART considered this WACC methodology reflected the financing costs of a new entrant. Its more recent methodology used a mix of long and short term historical rates and so the NPV neutrality principle was considered less likely to apply.[280]

640. The long term approach is consistent with that adopted by equity analysts, who use the longest term bonds available when evaluating the performance of equities vis-à-vis government bonds.[281] IPART, for example, highlighted survey evidence by Brotherson et al (2013) that financial advisors unanimously responded that they use bond maturities of 10 years or longer in cost of capital estimations.[282]

641. ATCO makes reference to similar survey evidence presented in the AER's Rate of Return Guidelines. The survey evidence referred to has its source in Incenta

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278 Australian Energy Regulator, *Rate of Return Guidelines, Explanatory Statement*, December 2013, p. 49.

279 Ibid.

280 Independent Pricing and Regulatory Tribunal, *Review of WACC Methodology, Final Report*, December 2013, p. 13.

281 The tenors available on government bonds are different depending on the country in question. In the United States (US), government bonds with terms of up to 20 years are more readily available and thus commonly used by US equity analysts in assessing risk premiums (see R. Ibbotson and R. Sinquefield, Stocks, Bonds, Bills and Inflation: Updates, *Financial Analysts Journal*, vol. 35, no. 4, July – August 1979, p.43 and *Duff and Phelps Risk Premium Report*, Duff and Phelps Corporation, 2013, p. 99). In Australia however, the most readily available long bonds have a tenor around ten years. Ten year government bond issues in Australia are therefore the longest term bonds that are consistently available to use in the estimation of Australian equity risk premiums in perpetuity.

282 W.T Brotherson, K.M. Eades, R.S. Harris, and R.C. Higgins, 'Best Practices in estimating the cost of capital: an update', *Journal of Applied Finance*, vol. 23, pp. 15-13.

Economic Consulting's (**Incenta**) report on the term of the risk free rate for the cost of equity. Incenta stated that interviewed valuation professionals were unanimous that regulators' application of a 5 year risk free rate would not change their use of the 10 year rate in valuations.[283]

642. ATCO's consultant, SFG, presents a range of evidence where the 10 year risk free rate has been applied for cost of equity estimations. This included:

- expert assessments in a 2012/13 sample group;
- Deloitte's report to ING Real Estate Community Living Group;
- a report for Hastings Diversified Utilities Fund; and
- decisions of the AER, Australian Competition Tribunal and IPART.

643. However, the Authority believes that the 10 year approximations of the perpetual rate of return on equity referred to by IPART, Incenta, SFG and the AER in the paragraphs above are applicable for valuing the cash flows to perpetuity. The Authority considers that such approximations do not reflect the prevailing conditions which apply for the regulatory period, and will tend to over or under compensate the regulated firm. This position reflects a fundamental difference of view between Australian regulators: some regulators, such as the AER and IPART, subscribe to the longer term estimate based on valuing cash flows to perpetuity, whereas as others, including the Authority and the Queensland Competition Authority, subscribe to a term that is consistent with that of the regulatory period.[284]

644. To continue the example from paragraph 634 the Authority notes that if a regulatory rate of return was set at the perpetual rate in late 2008 for the coming 5 year access arrangement, it would have been lower than the return required in the market to compensate for risk perceived over the coming 5 year period.[285] This is because the extraordinary market perceptions of risk at that time were not likely to persist in perpetuity.

645. For example, applying the perpetual or long term proxy rate at the start of 2008 would not meet the present value condition (NPV=0), nor would it have allowed investors to earn a return commensurate with the efficient financing costs over the regulatory period. The implication of this NPV=0 principle was discussed at length in the Rate of Return Guidelines.[286]

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[283] Incenta Economic Consulting, *Term of the Risk Free Rate for the Cost of Equity, Report for Energy Networks*, July 2013, p. 43.

[284] For the position of the Queensland Competition Authority, see Queensland Competition Authority, *Final decision: cost of capital: market parameters*, August 2014.

[285] It may be noted here that risk premiums on sources of funding increase during times of increased risk aversion. The yield curve has also been known to 'invert' during periods of heighted risk in financial markets (see H. Campbell, Forecasts of Economic Growth from the Bond and Stock Markets, *Financial Analyst Journal*, vol.45, no.5, September – October 1989). Yield curve inversion is the situation where, the yield on relatively short (5 year) government bonds tends to exceed the yield on longer (10 year) government bonds. Using the yields on the 5 year risk free rate in the regulated rate of return will better compensate the cost of asset funding during the periods when funding is most difficult to access.

[286] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 2, p. 29.

646. In summary, the forward looking return on equity for the benchmark efficient entity should not be assumed to be the same as the return in perpetuity. Rather, it should be set based on a 5 year forward looking term, consistent with the regulatory period.

647. The Authority is therefore of the view that the regulated firm's cost of funding is best met through the use of the 5 year rate, including for the risk free rate. Accordingly, the Authority will apply a five year term for the risk free rate for its estimate of the return on equity.

Term for the risk free rate for the cost of debt

648. In the Rate of Return Guidelines the Authority determined that the term of the risk free rate for the cost of debt should be consistent with the term of the regulatory period, that is, 5 years.[287]

649. The reasoning underlying this was outlined in Appendix 2 of the Rate of Return Guidelines, and was based on Lally's 2010 report for the Queensland Competition Authority. Specifically it was noted by the Authority that:[288]

> Lally proposes a further scenario 3 to deal with a situation where credit default swaps are not available. In this situation, it is assumed that the regulated firm will borrow for a tenor of 10 years and use interest rate swaps to convert the ten-year risk-free rate to a five-year risk free rate. Given the difficulties with using credit default swaps to convert a 10-year debt risk premium to a 5-year one, Lally suggests the regulator should use: (i) the five-year risk-free rate, (ii) 10-year debt risk premium, (iii) annualised 10-year debt issuance costs; and (iv) the transaction costs involved with swap contracts. Whilst this would violate the NPV=0 principle, Lally suggests that this would be a slight deviation of approximately only 0.04% of the WACC per year.

650. The application of a 5 year risk free rate and an allowance for costs associated with interest rate swap contracts (see paragraph 917 for the latter) replicates the efficient financing costs of a benchmark efficient entity operating in a competitive market. The benchmark efficient entity may manage refinancing risk by issuing longer term debt, but may hedge the underlying base rate by entering into 5 year swaps.

651. The Authority considers that the Australian market for interest rate swaps has the depth and liquidity to cover the notional amounts required by regulated utilities in Australia. To illustrate the point, Figure 26 indicates that there has been a strong increase in the turnover of such derivatives, to approach 9 trillion dollars in 2012-13, up almost 3 trillion dollars since 2007-08.

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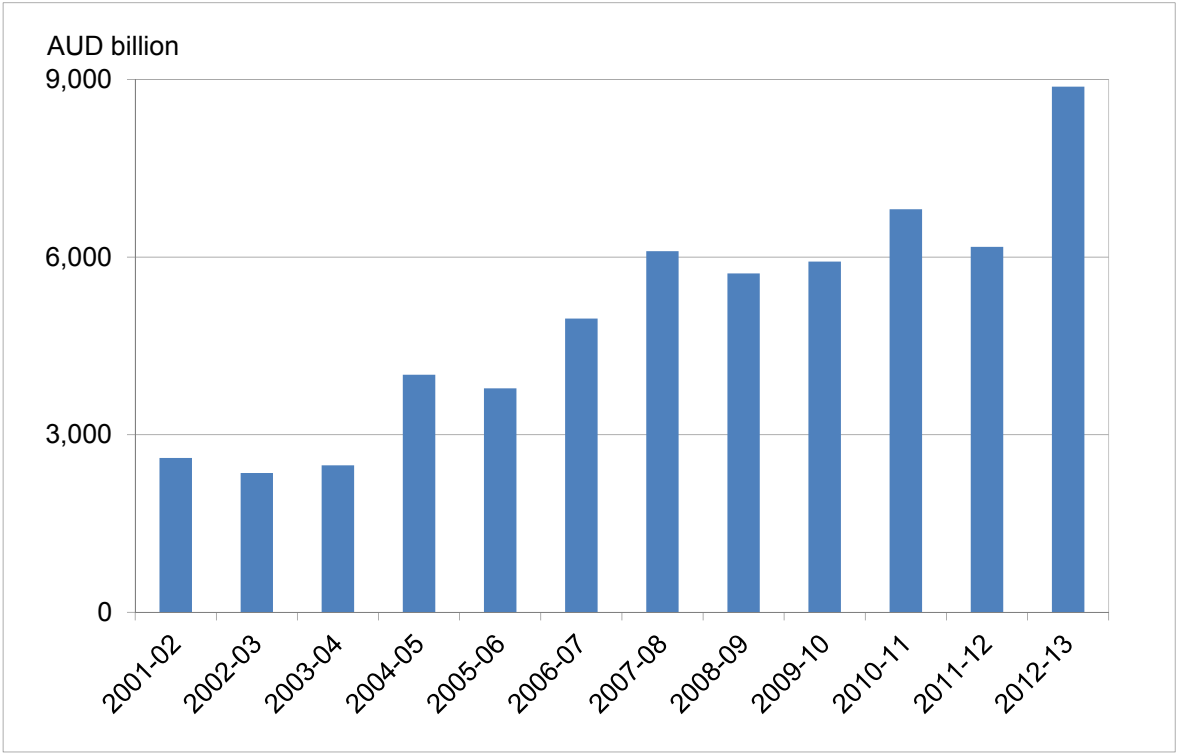
287 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 2, p. 29.

288 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 2, p. 25.

Figure 26 Interest rate and cross currency swaps annual turnover Australia



Source: Australian Financial Markets Association 2013 Report

652. Accordingly, the Authority will apply a five year term for the risk free rate for its estimate of the cost of debt.

Averaging Period

653. ATCO is of the view that the adoption of either a 20 day period or a 40 day period is immaterial to the outcome of the rate of return and no issues were raised. The Authority will adopt the averaging period of 40 days as set out in the Rate of Return Guidelines.

654. For the purpose of this draft decision, however, it was not practical to implement the full 40 day averaging period. Estimates of parameters are thus indicative only, as they are based on the shorter averaging period of 7 business days.

655. The Authority accepts ATCO's proposal to determine the final averaging period on a basis that the dates will remain confidential until the Authority delivers its final decision, consistent with prior practice.

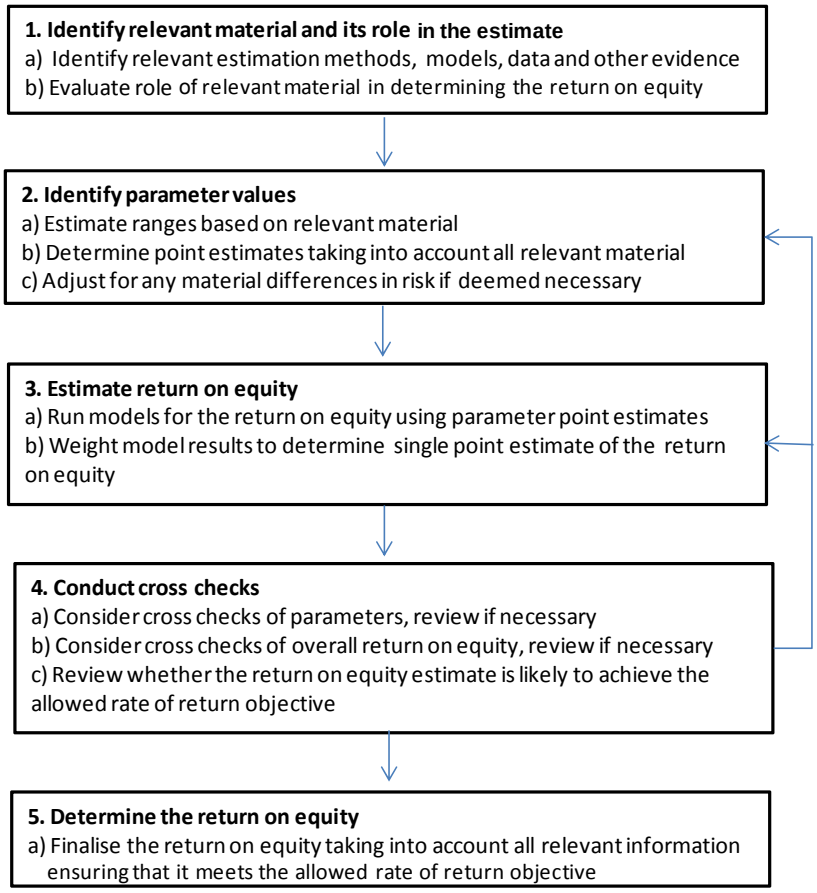
ERA estimate as at 9 September 2014

656. The indicative 5 year risk free rate of return based on the recent average Australian Commonwealth Government Treasury Bonds is 2.95 per cent as at 9 September 2014.

Return on equity

657. The Rate of Return Guidelines set out that the Authority will utilise a five step approach for estimating the return on equity.[289] The five steps are summarised in Figure 27.

Figure 27 Proposed approach to estimating the return on equity[290]



Source: Economic Regulation Authority, *Rate of Return Guidelines*, 16 December 2013, p. 23.

658. Through this approach, the Authority has assessed a wide range of material, and identified relevant models for the return on equity, as well as a range of other relevant information. For this Draft Decision, the Authority has given weight to relevant material, according to its merits at the current time, seeking to deliver fully the requirements of the allowed rate of return objective.[291]

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289 Economic Regulation Authority, *Rate of Return Guidelines: Meeting the requirements of the National Gas Rules*, 16 December 2013, p. 22.

290 The Authority considers that the term:

- 'approach' refers to the overall framework or method for estimating the return on equity, which combines the relevant estimation methods, financial models, market data and other evidence;
- 'estimation material' refers to any of the relevant estimation methods, financial models, market data and other evidence that contribute the 'approach'; and
- 'estimation method' relates primarily to the estimation of the parameters of financial models, or to the technique employed within that model to deliver an output.

291 The allowed rate of return objective is set out at NGR 87(3):

659. The Authority noted in the Rate of Return Guidelines that:

> Rate of return estimate materials – the estimation methods, financial models, market data and other evidence – would need to be broadly consistent with the requirements of the NGL, the NGO, the NGR and the allowed rate of return objective to be considered relevant. Some estimation materials may perform better on some requirements and less well on others, and yet may still be considered relevant. Accordingly, the assessment is whether, on balance, estimation materials are consistent with the requirements of the NGL, the NGO, the NGR and the allowed rate of return objective.
>
> Nevertheless, estimation materials would need to pass a threshold of adequacy to be considered relevant. To the extent that estimation materials failed the adequacy threshold, then they would be rejected. This rejection would be consistent with the AEMC's purpose for the guidelines:[292]
>
>> In order for the guidelines to have some purpose and value at the time of the regulatory determination or access arrangement process, they must have some weight to narrow the debate.
>
> Once over the threshold for adequacy, then, as noted, any particular estimation material may meet the requirements of the NGL, the NGO, the NGR and the allowed rate of return objective to a greater or lesser degree. With this in mind, the criteria would then be used as a means to articulate the Authority's evaluation of the estimation materials, in terms of how they performed in meeting the requirements of the NGL, the NGO, the NGR and the allowed rate of return objective. In this way, the criteria are intended to assist transparency around its exercise of judgement. [293]

660. In line with the requirements of NGR 87(5), the Authority considers that it evaluated the relevance of a broad range of material in the Rate of Return Guidelines, covering relevant estimation methods, financial models, market data and other evidence.[294] However, the Authority determined that only a subset of the evaluated material could be considered relevant in the Australian context, so as to best achieve the allowed rate of return objective.

661. The following analysis provides an indicative assessment, as at 9 September 2014, of the return on equity for ATCO, consistent with delivering an outcome that meets the approach set out in the Rate of Return Guidelines, and hence the allowed rate of return objective, as well as the NGL and NGR more broadly.

Step 1 – Relevant materials

662. The Authority evaluated the relevance of the following materials for estimating the return on equity in the Rate of Return Guidelines, in terms of their ability to contribute to the achievement of the allowed rate of return objective:[295]

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.

292 Australian Energy Market Commission, *Rule Determination, National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, www.aemc.gov.au, 29 November, p. 58.

293 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 12.

294 Australian Energy Market Commission, *Rule Determination: National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, www.aemc.gov.au, 29 November 2013, p. 36.

295 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 8.

- the Sharpe Lintner Capital Asset Pricing Model (**CAPM**), as well as other asset pricing models in the CAPM 'family'; and
- an extensive range of other models and approaches which seek to estimate the return on equity.

663. The Authority concluded that only the Sharpe Lintner CAPM model is relevant for informing the Authority's estimation of the prevailing return on equity for the regulated firm at the current time. The Authority considered that incorporating returns from other models would detract from the ability of the Authority to meet the allowed rate of return objective.

664. However, the Authority determined that it would give weight to relevant outputs from the DGM when estimating the market risk premium (**MRP**), which is an input to the Sharpe Lintner CAPM.[296]

665. The Authority also noted the empirical evidence provided by the Black and Empirical CAPM models, pointing to potential bias in the estimates from the Sharpe Lintner CAPM, and noted that it would take this information into account when estimating the point estimate of the equity beta from within its estimated range.[297]

666. The Authority concluded that other models and approaches are not relevant within the Australian context, at the current time, without some new developments in terms of the theoretical foundations or in the empirical evidence. Generally, there are resulting shortcomings with regard to robustness in the Australian context. On this basis, the Authority considered that these other models are not 'fit for purpose' or able to be 'implemented in accordance with best practice'.

667. The Authority considers that its approach in the Rate of Return Guidelines with regard to the determination of relevance – in terms of best meeting the allowed rate of return objective – is consistent with the intent of the AEMC:[298,299]

> … In general the final rules give the regulator greater discretion than it has currently. The objectives and factors show the regulator what it must bear in mind when it exercises that discretion.
>
> The role of the objective is to indicate what the regulator should be *seeking* to achieve in the exercise of its discretion. Some stakeholders appear to have understood the objectives as imposing on the regulator a requirement and that failure to comply with this would mean the regulator is in breach of the rules. This is not the case. Although the language of an obligation is used in some objectives, it is not necessarily expected that the substance of the objective will always be fully achieved, but rather the regulator should be striving to achieve the objective as fully as possible. Where it is used in rate of return and capital expenditure incentives, the objective has primacy over other matters which the regulator is directed to consider.

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296 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 78.

297 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 67.

298 Australian Energy Market Commission, *Rule Determination, National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, www.aemc.gov.au, 29 November 2013, p. 36.

299 The Authority notes that relevant means 'closely connected or appropriate to the matter in hand' (Oxford dictionary) or 'bearing upon or connected with the matter in hand; to the purpose; pertinent' (Macquarie dictionary).

> These other matters include factors which the regulator is directed to consider. The rules use language such as "have regard to" and "take into account" to direct the regulator to consider certain factors. Throughout this rule change process there has been discussion over the respective meanings of these phrases. The Commission's approach is that these phrases mean the same thing and nothing is implied by the use of one rather than the other. The Johnson Winter & Slattery advice attached to the Australian Pipeline Industry Association (**APIA**) submission[300] includes a useful guide to how the phrases should be interpreted. The regulator must actively turn its mind to the factors listed, but it is up to the regulator to determine how the factors should influence its decision. It may, indeed, consider all of them and decide none should influence its decision. It is not intended that the regulator's decision is solely dependent on how it applies any or all of those factors. The intention is that where the rules require the regulator to consider certain factors in conjunction with an overall objective, it should explain its decision including how it has had regard to those factors in making a decision that meets the objective.

New information in the ATCO submission

668. The Authority considers that ATCO has presented only limited new information – in relation to relevant estimation methods, financial models, market data and other evidence – that was not considered as part of the development of the Rate of Return Guidelines. The only element that was not explicitly addressed in the Rate of Return Guidelines relates to estimating the required return on the market, as a relevant means to inform the return on equity for the benchmark efficient firm.

669. This proposal is considered in what follows.

670. ATCO has presented an estimate of the required return on the market (or average firm with a beta of 1) as being a relevant estimate for the benchmark efficient firm. To estimate the required return on the market, ATCO has drawn on four estimates, each based on an assumed gamma of 0.25:

- a DGM estimate developed by SFG in 2013 for the broad market, giving the contemporaneous required return on the market of 11.3 per cent;
- an updated estimate of the Wright approach using the most recently available data, giving a required return on the market of 11.7 per cent;
- an updated estimate of the Ibbotson historical mean excess stock return, giving a resulting historical mean MRP estimate of 6.6 per cent, which added to a 4.06 per cent estimate of the ten year risk-free rate yields an estimate of the required return on the market of 10.7 per cent;

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300 APIA, *Economic Regulation of Network Service Providers: Response to AEMC*, www.aemc.gov.au, 4 October 2012, Appendix 1, p. 11. The Authority notes that that the Johnson Winter & Slattery advice stated:

> …as long as the Regulator has taken into account the specified factors, it remains in the Regulator's discretion how those factors influence its decision. The practical application of this rule could result in the Regulator considering other estimation methods, financial models, etc. but then putting all but one to the side and continuing to estimate the cost of debt and cost of equity using its already stated preferred approach (ie the Sharpe Lintner CAPM)…
>
> If evidence is "irrelevant", the Regulator will not fall into error by failing to "take it into account".
>
> In practice, of course, this will require some form of value judgment by the Regulator about whether evidence put before it is relevant or not. This appears to be consistent with the very broad discretion envisaged by the AEMC in the Draft Rule Determinations.

- a recent 2014 independent expert valuation report by Grant Samuel 'resulting in a with-imputation estimate of 11.3 per cent'.[301]

671. The four estimates are then equally weighted, giving a resulting estimate of the overall return on the market of 11.2 per cent.

672. The Authority considers that as this estimate for the return on the market is itself given a 25 per cent weight in the final estimate of the return on equity *for the benchmark efficient entity*, the outcome is to bring the estimate of the return on equity for the benchmark efficient firm closer to the return on the market.

673. The effect of this inclusion is similar to Blume type adjustments, whereby beta is adjusted towards 1, as a way of providing for mean reversion in the beta estimates. The Authority considered and rejected these types of adjustments in the Rate of Return Guidelines.[302] The Authority therefore does not accept the inclusion of an estimate with a beta of 1 as being consistent with the return required on the benchmark efficient entity.[303]

674. Furthermore, the Authority considers that it already accounts for much of the information used to determine ATCO's estimate of the return on the market. This is because the Authority's approach to implementing the Sharpe Lintner CAPM, in particular the approach to determining the MRP, is informed by:

- the Wright approach;
- the Ibbotson estimates;
- discounted cash flow estimates for the return on equity for the broad market – which include both the SFG DGM estimate and also those of other independent experts.

675. With regard to the Wright and Ibbotson approaches, the Authority undertook extensive analysis relating to the stationarity and co-integration of the components of the Sharpe Lintner CAPM.[304] The Authority found that the return on equity is likely to be stationary, and hence mean reverting. However, there was mixed evidence on the stationarity of the MRP, which provides only limited support for the Ibbotson approach for estimating the forward looking MRP based on the historic mean. On the other hand, there does not appear to be a consistent relationship between the risk free rate and the MRP, which is implied by the Wright approach.

676. Taking these findings into account, the Authority concluded that the MRP will fluctuate, and determined that it would exercise its regulatory judgment at the time of any determination in order to estimate the MRP.[305] This runs counter to ATCO and its

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301 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 244.

302 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 164.

303 The Authority set out in the Rate of Return Guidelines that it considers that the benchmark efficient entity should have a beta of 0.7. The Authority has further considered its estimate of the equity beta at paragraphs 734 to 757 below.

304 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Chapter 11.

305 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 159.

consultant SFG's claim that 'the outcome is the same estimate (6 per cent) as in every one of the ERA's previous decisions'.[306] It is entirely possible that the Authority will determine an MRP of other than 6 per cent when applying the Rate of Return Guidelines approach, and indeed, this Draft Decision does so.

677. Second, with regard to the estimate of the return on the market based on the DGM, the Rate of Return Guidelines has extensive consideration of estimates from this method.[307] The DGM is a key component informing the range for the MRP in the application of the Sharpe Lintner CAPM.

678. Third, with regard to the independent expert report by Grant Samuel cited by SFG, the Authority notes that it considered independent broker reports in the Rate of Return Guidelines. The Authority concluded:[308]

> Overall, the Authority considers that brokers' estimates may have potential to provide relevant information, particularly in terms of the parameters used in modelling, such as the market risk premium. In some cases, brokers' estimates may also provide relevant information for the overall return on equity of the regulated firm. However, as noted above, care is needed in interpreting such information. Such information is only likely to be relevant where it is supported by transparent analysis, implemented in accordance with best practice. In particular, the term needs to be consistent with the regulatory period, otherwise the economic efficiency requirements of the National Gas Law (**NGL**) and National Gas Rules (**NGR**) will be violated.

679. The Authority considers that independent analyst reports are useful as cross checks, but do not directly compare to the Authority's estimate for the five year regulatory period. The Grant Samuel estimates are discussed in more detail at paragraph 786 below.

Exclusion of models other than the Sharpe Lintner CAPM

680. The Authority notes that the Fama French three factor model (**FFM**) has consistently been put forward by regulated businesses as a means to estimate the return on equity. However, in its previous regulatory decisions, the Authority concluded that there is no strong theoretical basis to support the inclusion of the two additional risk factors to estimate the rate of return on equity, as occurs in the FFM. This is because the FFM is dependent on empirical justification – that is, the systematic observance of the FFM risk premia. In contrast, given that the FFM risk premia are not systematically observed in the Australian market, there is no reasonable basis for the FFM to be applied in Australia.

681. The Authority's recent analysis of the FFM in the context of the Australian market for equity, for this Draft Decision, shows that observed empirical evidence is not consistent with the FFM (refer to Appendix 4 of this draft decision).

682. The Authority's analysis considered the robustness of the estimates of the two additional risk premia (size factor and value factor) from the FFM in the Australian context. The study was conducted using a consistent dataset under various scenarios

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306 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 234 and ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 16.

307 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 159.

308 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 203.

in which different proxies are used and under different approaches in which portfolios are formed.

683. The Authority's analysis points to conflicting, variable FFM risk premia and inconsistent FFM factor coefficients, depending on the proxies and/or different portfolios adopted. It is noted that while the size factor is relatively well explained, the value factor is not. These findings are in line with other empirical studies in Australia.

684. The Authority therefore remains of the view that the FFM cannot contribute to the rate of return objective. A wide range of evidence, together with its own empirical analysis, suggests that the FFM is not fit for the purpose of estimating the return on equity, as:

- applications of the FFM in Australia fail to produce consistent outcomes;
  - the key contribution from the FFM is that the additional factors – the size (**SMB**) and value (**HML**) factors – are priced in explaining the return on equity;
  - however, studies in the Australian context do not consistently report this pricing – some studies price the size factor, while others price the value factor;
- different proxies are adopted in different empirical studies, with the result that the estimates from the FFM vary significantly from study to study;
- the Authority found – in its own empirical work (see Appendix 4) – that adopting different portfolio formation on the same dataset will provide different outcomes, yet portfolio formation is a key characteristics of the FFM;
- more than 300 different factors have been examined in empirical studies to date, but there is no body of theory to support which factors should be considered; and
- Fama himself now recognises that the Fama French 3 factor model is an empirical test, and is not based on theory, confirming the oft stated view of Australian regulators.[309]

685. With regard to the DGM, the Authority in the Rate of Return Guidelines considered applying the DGM for the purpose of estimating the return on equity for the individual infrastructure firm.[310] However, the Authority noted that the results are very sensitive to inputs, and hence to analyst discretion, particularly relating to growth rates.

686. In this context, the Authority notes that the AER investigated the possibility of using the DGM for estimating the return on equity for individual infrastructure businesses in Australia.[311] The AER found that the DGM estimates could not be relied upon as, among other things:

- the average estimated return on equity is consistently higher than that of the market over recent periods from 2006, even with real growth of dividends at zero; thus failing a basic 'sanity check';

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309 E. Fama and K. French, *A Five-Factor Asset Pricing Model*, 2014, Working Paper available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2287202

310 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 75.

311 Australian Energy Regulator, *Explanatory Statement: Rate of Return Guideline*, December 2013, p. 119.

- SFG Consulting's proposed DGM estimates for infrastructure business use analyst target prices, rather than the standard practice market price, and other non-standard approaches, potentially leading to upward bias in the estimate.

687. Having considered these findings, the Authority remains of the view that the DGM cannot be relied upon for estimating the return on equity for the firm.

Consistent application of the criteria to model selection

688. ATCO contends that the Authority has not applied its criteria consistently in its assessment of the return on equity models.[312] A key point made by ATCO, and its consultant SFG, is that the Sharpe Lintner CAPM is unlikely to meet several criteria, whereas the FFM generally satisfies the criteria at least as well.

689. The Authority does not accept this contention. As set out above, the Authority considers that a key failing of the FFM is that it is not robust in the Australian context. This is despite the updated study of Brailsford et al. The Authority also considers that the model is largely empirically driven, and lacks a strong theoretical foundation for the selection of the factors.

690. The Authority has re-examined these issues for this decision. However, the Authority is not persuaded that its conclusions in the Rate of Return Guideline with regard to the FFM were inappropriate. The Authority remains of the view that the FFM is not relevant information in the context of estimating the return on equity.

691. With regard to the purported failings of the Sharpe Lintner CAPM, the Authority notes SFG's views that the Sharpe Lintner CAPM:

- is a special case of the FFM, with the added assumptions that the size and book to market premiums are both zero;
- does not fit the data, due to the failure of the beta estimates to reflect stock returns; and
- does not flexibly produce estimates that reflect changes in market conditions.

692. First, the Authority does not agree that the Sharpe Lintner CAPM is a special case of the FFM. The Authority views the Sharpe Lintner CAPM as supported by theory, which is fit for purpose. While the FFM reflects an attempt to improve on the empirical performance of the Sharpe Lintner CAPM, it does not do so in the Australian context. The Sharpe Lintner CAPM remains valid because it provides results that are theoretically plausible, while also being well tested and understood in the Australian context.

693. Second, the Authority does not accept, as NERA does, that the Sharpe Lintner beta estimates do not reflect stock returns.[313] The Authority rejected the use of the Black CAPM in the Rate of Return Guidelines, on the basis that its empirical performance

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[312] ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 236.

[313] NERA, *Estimates of the Zero-Beta Premium*, June 2013.

was unreliable.[314] The Authority considers these issues in more detail at paragraphs 734 to 757.

694. Third, with regard to flexibility, the Authority does recognise that recent market conditions – since the global financial crisis – have raised important issues with regard to the application of the Sharpe Lintner CAPM. The Authority considers that its revised approach to estimating the Sharpe Lintner CAPM – set out in the Rate of Return Guidelines and implemented for this decision – allow for much greater flexibility in the estimates of the return on equity, thereby improving the overall estimates of that return.

695. For these reasons, the Authority remains of the view that its reasons for adopting only the Sharpe Lintner CAPM are sound. The Authority considers that its application of the Sharpe Lintner CAPM meets the requirements of the NGR, and the allowed rate of return objective.

Step 2 – Estimate parameters for the relevant models

696. The second step involves estimating parameters for relevant models. As the Authority considers the Sharpe Lintner CAPM to be the only relevant model for estimating the return on equity in the Australian context, only the parameters for that model are considered here:

- risk free rate;
- MRP;
- equity beta.

697. The Authority in the Rate of Return Guidelines determined the following ranges for the parameters to be used in the Sharpe Lintner CAPM:

- the risk free rate will be based on a 5 year term to maturity, determined as the average of observations over a 40 day period just prior to start of the regulatory period;[315]
- the MRP will be estimated in the range of 5.0 per cent – 7.5 per cent, drawing on forward looking information;[316]
- the equity beta will be estimated in the range of 0.5 – 0.7.[317]

698. The following sections set out the Authority's considerations in relation to the estimates of the parameters for the Sharpe Lintner CAPM, in order to best meet the requirements of the allowed rate of return objective.

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314 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, www.erawa.com.au , December 2013, Appendix 8.

315 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, chapter 7.

316 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, chapter 11.

317 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, chapter 12.

Risk free rate

699. The Authority considers that a 5-year term for the risk free rate is consistent with the 'present value principle', and with investors' horizons with regard to the regulated assets, given the 5-year regulatory period (see paragraphs 630 to 652).

700. The average of the observed 7 days of the 5-year Commonwealth Government Securities (**CGS**) risk-free rate as at 9 September 2014 was 2.95 per cent (see paragraph 656). This provides a point estimate for the risk free rate.

Market risk premium

Estimated range of the MRP

701. ATCO's consultant SFG claimed that the Authority proposed to use a 'range provided by historical data' and that the Authority interpreted this as a bound for what the forward looking value of the MRP might be.[318] SFG suggested that this is wrong on the basis that the range reflects the 'statistical precision of that data'. It states that using the statistical range does not convey information about expectations of market returns under certain market conditions, and therefore that using the historic range as a bound is wrong:[319]

> In summary, if the ERA were to use a range reflecting the statistical precision of an unconditional historical average to bound the possible values of its conditional estimate (conditional on the prevailing conditions in the market for equity funds), it would clearly be in error.

702. It appears SFG has erroneously interpreted the Authority's reference to 'a range provided by historical data', as being a reference to the statistical range, based on the observations of a single data series. However, in its Rate of Return Guidelines the Authority considered a range of MRP estimates including those developed as part of other regulators' decisions, various estimates of the historical market risk premium, and various DGM estimates. Two types of estimates – those based on the DGM and on historical averages – and multiple estimations of each based on various sets of data (as opposed to a single set) were considered appropriate to establish a range for the MRP. The statistical range around each of the various estimates was not used in establishing the range of 5 per cent to 7.5 per cent. The resulting range spanned the outcomes of the estimates the Authority considered fit for purpose.

703. SFG also contends that long run (or unconditional) estimates such as historic averages should not be used in forming a range for the MRP.

704. However, the Authority considers that investors will condition their expectations on 'what is possible' using available data. Therefore, excluding the historic estimates would be omitting relevant information. Historical averages provide one piece of information to assist investors seeking to form their expectations on what is the most likely future outcome.

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318 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, pp. 55-56.

319 ATCO Gas Australia, Access Arrangement Information: 1 July 2014 – 31 December 2019, 3 April 2014, Appendix 19, p. 56.

705. In summary, the Rate of Return Guidelines established upper and lower bounds based on reasonable estimates for the range of potential future outcomes, given the period of five years in question.[320]

706. The Authority considers that this provides a reasonable range for expectations for future outcomes *over the next five years*, while taking prevailing market conditions into account at the time of the decision.

Stationarity of the MRP

707. ATCO contends that the Authority assumes 'that there is no inverse relationship between the MRP and risk free rate as accepted and demonstrated by other methods and models'.[321]

708. ATCO's consultant SFG argues that the Ibbotson approach – and hence the idea of a constant MRP consistent with the historic mean – is flawed (unless markets are in an 'average' condition). SFG considers regulators should have primary regard for the Wright approach, where the return on equity is largely constant.[322] SFG notes:

> Moreover, in "average" market conditions,[323] both approaches will produce similar estimates of the required return on the market and MRP. When market conditions are not average, careful consideration must be given to the relative weights to be applied to each of the two approaches. For example, in the current market conditions the Ibbotson approach implies that the required return on the market is well below its average level whereas the contemporaneous evidence from dividend discount models and independent expert reports suggests that the reverse is true. This evidence should be relevant when considering the relative weight to be applied to the Ibbotson approach in the current market circumstances.

709. The Authority does not agree with these contentions.

710. First, extensive statistical analysis undertaken on these issues in the Rate of Return Guidelines led the Authority to conclude that the MRP may fluctuate, depending on economic conditions:[324]

> The Authority's empirical analysis has also found that: (i) the MRP can be stationary depending on the statistical method used (Appendix 16); (ii) no conclusive relationship between the MRP and the risk free rate exists (Appendix 16); and (iii) the cash rate (or monetary policy) is co integrated with the risk free rate (Appendix 11- Co-integration between Commonwealth Government bond yields and the cash rate).
>
> … The Authority is therefore of the view that there is inconclusive evidence to suggest any qualitative relationship existing between the risk-free rate of return and the MRP. Given the conflicting evidence regarding the relationship between the risk free rate and MRP, it is necessary to use different methodologies, in addition to regulatory judgement

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320 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, pp. 149–152.

321 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 240.

322 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 42.

323 Average market conditions would be characterised as conditions in which the risk-free rate and market risk premiums were close to their long-run means.

324 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, pp. 146-147.

in determining the appropriate value of the MRP. However, the implication of the analysis is that the MRP may fluctuate, depending on economic conditions. On this basis, the Authority considers that the forward looking MRP does vary. The Authority is of the view that the direction of that fluctuation – relative to the risk free rate and the return on equity – is not quantifiable. As a consequence, auxiliary information must be used to determine the appropriate point estimate within an estimated range of MRP values.

711. Second, the Rate of Return Guidelines concluded that there does not appear to be a *consistent* relationship between the risk-free rate and the MRP over the periods examined.[325] As a consequence, the Rate of Return Guidelines indicated that the Authority will exercise regulatory judgment at the time of a determination in order to estimate the appropriate point estimate within the estimated MRP range.[326] This view subscribes neither to the assumption of an inverse relationship existing between the risk free rate and the MRP (the so called 'Wright approach') or to that of a constant MRP (Ibbotson approach) over any five year period. However, the bounds for the estimate of the MRP are developed with reference to both approaches.

712. Third, the Authority notes the evidence set out in the Rate of Return Guidelines that the return on equity is stationary, and therefore mean reverting, but that the MRP is not.[327] However, this does not mean that the Authority considers that the real return on equity is a constant, as in Wright's view.[328] Rather, consistent with the evidence, the Authority's view is that the return on equity is more stable than the MRP, over the longer term.

713. The upper bound of the Authority's range for the MRP is informed by DGM estimates for the return on the market, and provides evidence as to current expectations for the return on equity and the MRP.[329]

714. The Authority considers that at any point in time, the DGM encompasses expectations about an average future return on *equity*, and that implicitly the MRP is expected to vary in proportion to changes in the risk free rate to ensure that those expectations are maintained.[330] The DGM is thus consistent with current expectations on a long run

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325 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 137.

326 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 159.

327 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 136.

328 The Wright approach adopts the assumption of a constant *real* market cost of equity (see for example, Wright S., *Review of Risk Free Rate and Cost of Equity Estimates: A Comparison of UK Approaches with the AER*, 25 October 2012, p. 2).

329 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 137.

330 The Authority notes in this context SFG's criticism (ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 44) that it incorrectly stated that the DGM assumes the market cost of equity never changes over time (see Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 154). However, Lally states clearly (M. Lally, *The Dividend Growth Model*, 4 March 2013, p. 3 and p. 5):

…the conventional DGM approach used by CEG will overestimate the MRP when the risk free rate is low (and underestimate it when the risk free rate is high), because the DGM assumes that the market cost of equity never changes over time, and therefore that any changes in the MRP and the risk free rate are perfectly offsetting; such perfect offset is neither plausible nor do CEG offer any evidence in support of it.

…As used by CEG, the DGM estimates the cost of equity for the market consistent with the current dividend yield and assumptions about the future growth rate in dividends, and then deducts the current risk free rate to

average return on equity, to perpetuity. Accordingly, the Authority considers that the DGM is more consistent with the view that the return on equity is stationary, and will deliver that estimated average return over time.

715. The Authority therefore, by establishing a combined range for forward looking expectations for the MRP based on the two approaches, considers that it has accounted for the alternative views relating to the stationarity of the MRP. By selecting a point value from within that range, the Authority is subscribing to neither approach in its entirety, but rather taking into account a range of information about forward looking returns.

Downward bias in the historic estimates

716. ATCO considers that there is evidence relating to the downward bias in the historical mean estimate of the MRP. Specifically:[331]

> A recent report by NERA (2013)[332] identifies and corrects a number of errors and inaccuracies in the adjustments that were made in the Brailsford et al (2008, 2012) calculations that form the basis of the ERA's historical mean estimate. The data for part of the period examined by Brailsford et al was sourced from Lamberton (1958). The Lamberton data reported the mean dividend yield where the mean was taken only over those companies that paid dividends. Consequently, it overstated the dividend yield in that it excluded from the calculation those companies that did not pay any dividends at all. This led Brailsford et al to adjust all of the Lamberton data points using an adjustment based on the proportion of firms that paid no dividends in 1966. NERA show that the proportion of firms that paid no dividends in 1966 was materially different to the proportion that paid no dividends during each of the years actually covered by the Lamberton data. That is, the Brailsford et al adjustment is inaccurate and it creates a systematic downward bias.
>
> NERA (2013) correct the bias in the Brailsford et al (2008, 2012) estimates and go on to make a more accurate and appropriate adjustment according to the proper contemporaneous proportion of non dividend- paying stocks. NERA report an historical estimate of 6.5% based on a 0.35 (theta) value assigned to distributed imputation credits.
>
> In summary, the historical mean estimate should be centred around 6.5%, not 6.0%.

717. The Authority notes the findings of NERA. This adds to the range of material on the bias or otherwise in estimates of the historic mean MRP that was set out in the Rate of Return Guidelines, including evidence that the historic mean MRP is likely to overestimate the true expectation.[333]

718. A further consideration relating to the mean market MRP is the introduction of imputation credits, which will have reduced the observed return on the market since 1987, ceterus paribus (see the section on gamma).

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yield a current estimate of the MRP. In the first such step, at any given point in time, the market cost of equity is assumed to be the same for all future years.

…This does not rule out the possibility that this uniform expectation for all future years changes as one moves through time, due to changes in the market dividend yield or the expected growth rate in GDP.

331 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 79.

332 NERA, 2013, *Estimates of the Zero-Beta Premium*, June.

333 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 151.

719. The quality of data is a key consideration when applying regulatory discretion in the selection of an estimate within the range. Handley advised the AER that the differing periods in his analysis corresponded to increasing data quality, but a decreasing sample size.[334] His advice concluded that:

> …estimates based on the latest available data up to 2010 are in my opinion the most relevant for this purpose.[335]

720. Handley's estimate using the latest available data forms the bottom of the MRP range established in the Rate of Return Guidelines. The use of this estimate addresses NERA's concern regarding data quality. Furthermore, its use as the means to determine the lower bound of the range (as opposed to the midpoint) addresses NERA's concern regarding the Brailsford et al (2008, 2012) estimate being used as a midpoint.

Use of estimates based on the DGM

721. ATCO cites a recent DGM study by IPART, to suggest that the approach set out in the Rate of Return Guidelines is not the best estimate of the MRP.[336]

> The ERA follows the AER approach of making a number of "adjustments" to the data when compiling their DGM estimates. For example, the ERA estimates long-run dividend growth by applying a non-standard downward adjustment to long-run GDP growth. Then, having determined the long-run required return on equity, the ERA makes a further downward adjustment based on the assumption that the market will require a lower return over the forthcoming regulatory period than over subsequent periods. All of these adjustments have the effect of reducing the estimate of the required return.
>
> By way of comparison, IPART has recently examined a range of DGM estimates that do not make these non-standard adjustments, including the approaches of Damodaran (2013), Bank of England (2002) and Bank of England (2010). IPART concludes that these models indicate a contemporaneous MRP of 7.9%.

722. As noted above, in establishing the MRP range in the Rate of Return Guidelines the Authority considered it appropriate to use estimates of the DGM.[337] In doing so, the Authority noted that the DGM estimates of the MRP are extremely sensitive to the input assumptions adopted in the model. The model can result in extreme values for the MRP. Median measures of central tendency are more appropriate when extreme observations are evident. The Authority considered 11 different estimates and based on a median of these observations established the top of the MRP range as 7.5 per cent. It did not rely on its own DGM estimate to inform the range.

723. ATCO suggests that a better approach, in light of the 'the widely debated topic due to its disputed relationship with movements in the risk free rate', is to weight equally four different approaches to estimating the MRP.

724. The Authority has addressed this matter at paragraphs 669 to 678 above.

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334 Handley, J.,'An Estimate of the Historical Equity Risk Premium for the Period 1883 to 2010', *Report Prepared for the Australian Energy Regulator,* 2011, p. 4.

335 Ibid, p. 10.

336 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 79.

337 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 156.

Outcomes for the MRP taking account of the forward looking indicators

725. The Rate of Return guidelines set out that a forward looking indicators approach would be used to condition the point estimate of the MRP within the estimated range, for the 5 years of the access arrangement:[338]

> The Authority considers that a range of other information is relevant for determining the point estimate of the MRP… this additional information will be considered as to whether it implies a revision, upwards or downwards, to the midpoint of the MRP range.

726. Four forward looking indicators of market conditions for the next 5 years that are readily available and up-to-date are adopted for this purpose. These are:

- the Australian Stock Exchange (ASX) 200 volatility index (**VIX**) which measures investors' perceptions of equity market risk;
- dividend yields on the All Ordinaries, a financial metric;
- interest rate swap spreads on 5 year bonds, which can be viewed as a type of term structure variable; and
- default spreads, another term structure variable that makes forward looking expected returns explicit.[339]

727. The results for each of the four forward looking indicators outlined in paragraph 725 for calculating a 5 year forward looking MRP are presented in Figure 28. These are the 'normalised values of the indicator, applied to the Authority's range for the MRP of 5 to 7.5 per cent.[340] This provides a transparent means by which the relative levels of different types of current forward looking data can be summarised into a single number and compared with one another.[341] The results in Figure 28 are for every business day since 1993, using a 40 day average to represent the 'on-the-day' level for each indicator.

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338 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 216.

339 The default spread was calculated as the difference between the 5 year AA Australian corporate Bloomberg fair value curve and 5 year Commonwealth Government Bond index. These series are the most liquid, complete and up to date default spread measures available to the Authority and so are considered the most efficient reflection of market price movements.

340 Figure 28 applies each normalised indicator to the range of the MRP of 5.0 to 7.5 per cent. So for example, the normalised default spread value for any day is calculated by:

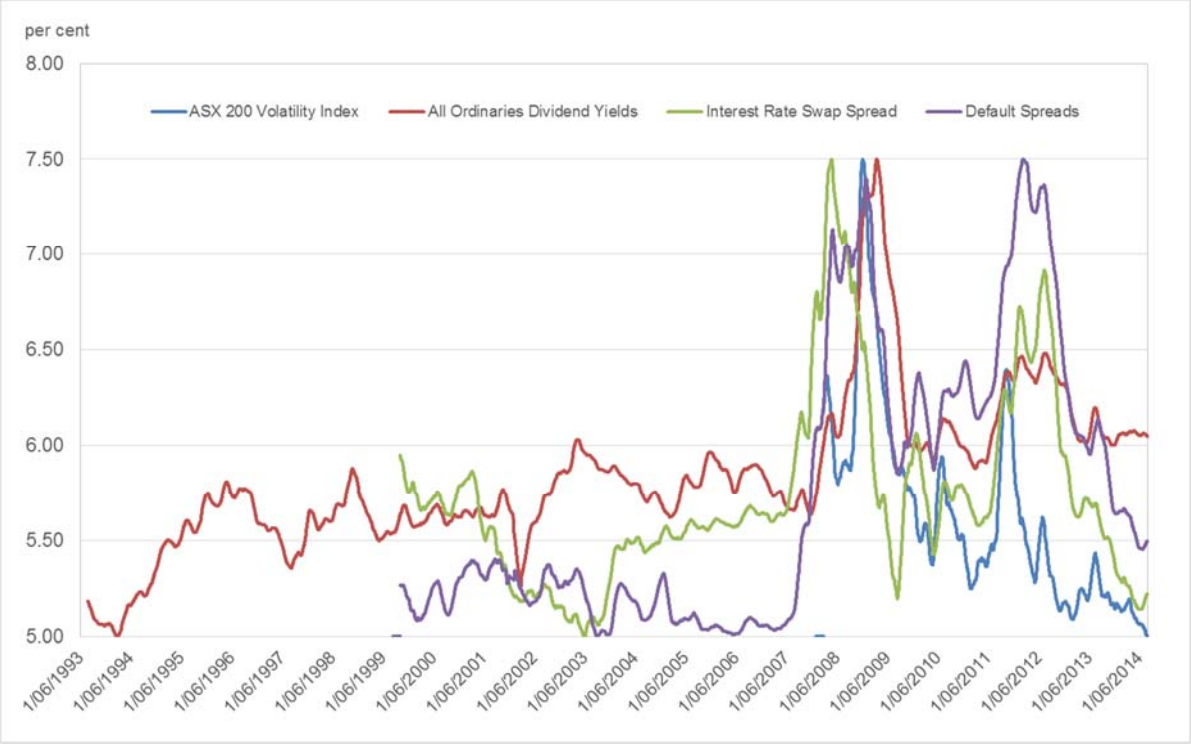
- first subtracting the minimum observed value in the default spread data range from the daily value;
- second, dividing the resulting value from the first step by the difference between the maximum observed value of the default spread and the minimum observed value.

The daily MRP is calculated by multiplying the normalised daily default spread value by 2.5%, and then adding 5%. Thus if the normalised value is 0, the MRP will be 5%. If the normalised value is 1, the MRP will be 7.5%.

Figure 28 plots the rolling 40 day average of the resulting daily MRP values.

341 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 209.

Figure 28 5 year Forward Looking Market Risk Premium



Source: Bloomberg and ERA Analysis

728. The forward looking MRPs informed by this approach have been relatively stable much of the time since 1993, but spike upwards towards the maximum of the Authority's range of 5 to 7.5 per cent with the onset of the Global Financial Crisis of 2008 and Eurozone Crisis thereafter.

729. Table 42 shows the value of the MRP for each indicator under the most frequently observed conditions (as represented by the value of the MRP modes) and also the most recent forward looking estimates.

Table 42 Forward looking MRP as at 9 September 2014

Forward Looking Indicator	MRP mode (%)	MRP as at 9 September 2014 (%)	Weight
ASX 200 Volatility Index (VIX)	5.2	5.0	0.10
ASX 200 Dividend Yields	5.8	6.0	0.30
5 Year Interest Rate Swap Spread	5.8	5.2	0.30
Corporate Default Spread	5.3	5.5	0.30
Weighted MRP Result	5.6	5.5	

Source: Bloomberg and ERA Analysis

730. A weighting to each of the four forward indicators is assigned, to account for the quality and relevance of each of the forward indictors. Least weight is assigned to the ASX 200 volatility index, reflecting the short period of the data and its short term forward

outlook.[342] The other three indicators are weighted equally, as they are all considered to provide equally relevant information for the 5 year forward term.

731. The weighted result for the more frequent (mode) conditions over the full series is 5.6 per cent. This estimate is reflective of more 'typical' market conditions, which tend to be observed much of the time. Figure 28 indicates that these conditions will be below the weighted mean of the series, given the influence of the significant upward spikes, such as during the GFC.[343,344]

732. The current weighted forward looking estimate, as at the 9 September 2014, is 5.5 per cent. This indicates that the forward looking indicators suggest that, as at 9 September 2014, financial markets are expected to perform close to 'typical' market conditions over the next 5 years.

733. The Authority considers that an estimate of 5.5 per cent provides the best indication of the 5 year forward looking MRP given prevailing conditions, and should be adopted as the value of the MRP for this draft decision.

Equity beta

734. Under the CAPM, the total risk of an asset is divided into systematic and non-systematic risk. Systematic risk is a function of broad macroeconomic factors (such as economic growth rates) that affect all assets and cannot be eliminated by diversification of the investor's asset portfolio.

735. The key insight of the CAPM is that the contribution of an asset to the systematic risk of a portfolio of assets is the correct measure of the asset's risk (known as beta risk), over and above the return on a risk free asset.

736. In contrast, non-systematic risk relates to the attributes of a particular asset. The CAPM recognises this risk can be managed by portfolio diversification. Therefore, the investor in an asset does not require compensation for this risk.

737. In the CAPM, the equity beta value is a scaling factor applied to the market risk premium, to reflect the relative risk for the return to equity of the firm in question. Two types of risks are generally considered to determine a value of equity beta for a particular firm: (i) the type of business, and associated capital assets, that the firm operates; and (ii) the amount of financial leverage (gearing) employed by the firm.

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342 ATCO's consultant SFG also expressed concern that the ASX 200 volatility index is available for a short period of time which is dominated by the Global Financial Crisis. However, the Authority considers that the ASX 200 volatility index is informative for gauging the direction of changes in investors' perceived level of risk in the financial market. That is, whether levels of risk aversion are reverting to or diverting from long run levels of risk that underlie expectations of returns in the market. Although the series is short it corroborates the direction of changes in the levels of perceived risk exhibited by the other indicators.

343 The weighted mean of the observations for the four indicators is 5.8 per cent.

344 ATCO considers that there is no justification for choosing a point estimate below the midpoint of the range (ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 240). However, the Authority considers that if the MRP is below the midpoint the majority of the time, only spiking to very high levels on rare occasions, then adopting the mean could be an upwardly biased representation of the forward looking MRP most likely to result. That said, the Authority derives its estimate based on the prevailing conditions. Figure 28 clearly indicates that an MRP below the mid-point of the range of 6.25 per cent is reasonable, much of the time.

738. In the Rate of Return Guidelines, the Authority considered that empirical evidence must be used to inform its judgment for equity beta, as no prior expectation exists for the equity beta of regulated gas distribution and transmission networks.[345] The Authority conducted detailed empirical estimation of the required equity beta.[346] The Authority notes that ATCO and its consultant have not submitted any new criticism of the econometric techniques employed by the Authority, focusing instead on qualitative decisions used to determine the permissible range. The qualitative decisions by the Authority are summarised below, given they are still in contention, particularly as ATCO has resubmitted the same submission previously considered in the Rate of Return Guidelines.[347]

739. First, the Authority considered that it was inappropriate to include overseas businesses in the comparator sample which was used to estimate the required equity beta of the benchmark efficient entity. This was based on the consideration that whilst a larger sample may improve the comparator sample size, such an inclusion will be outweighed by the distortions caused due to the dissimilarity with the benchmark efficient entity. The Authority reiterates here that for gas networks, international comparators are deemed irrelevant, as domestic comparators are best able to capture the risks faced by the benchmark efficient entity representing gas regulated entities. In particular, international gas distribution and transmission networks are subject to more competition than Australian domestic gas networks, and subject to differing regulatory regimes, tax laws, industry structure and broader economic environment. The Authority therefore considered international comparators were not relevant for constructing the benchmark efficient comparator sample.

740. Second, the Authority did not accept the argument for utilising the Blume adjustment of revising the estimated market equity beta of 1.[348] Blume (1975) observed empirically that estimated beta coefficients tend to regress towards the grand mean of all betas over time; that is the value of one.[349] This argument was based on the view that projects will become less risky over time for high risk firms and new projects will have less extreme risk than existing projects. The Blume adjustment takes this into account by applying a weight of 0.67 to a raw beta estimate and a weight of 0.33 to the market beta estimate of 1.0. The Authority reviewed the arguments for the Blume adjustment and concluded that it was not appropriate for regulated gas networks.[350]

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345 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, p. 161.

346 Econometric analysis of beta was conducted in: Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, Chapter 12. Justification and explanation for econometric techniques was provided in Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, Appendix 17, 22 and 23.

347 ATCO have resubmitted Strategic Finance Consulting, *Regression-based estimates of risk parameters for the benchmark firm,* June 2013 as part of their Access proposal. The Authority considered this report as part the Energy Networks Association submission made during the development of the Rate of Return Guidelines (see www.erawa.com.au/gas/gas-access/guidelines/rate-of-return-guidelines).

348 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, Chapter 12.

349 M. Blume, 'Betas and their regression tendencies', *Journal of Finance*, June 1975.

350 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, p. 164.

741. Third, the Authority also acknowledged that a high level of imprecision existed for any empirically estimated value of the equity beta. The Authority considered that issues of imprecision are best addressed via the use of multiple models and statistical techniques to inform a possible range for any equity beta estimate. These issues and statistical techniques were explored at length in the Rate of Return Guidelines.[351]

742. Based on this analysis, the Rate of Return Guidelines set out that the estimated range of the equity beta for the benchmark efficient entity is between 0.5 and 0.7. The Authority also noted in the Rate of Return Guidelines that relevant empirical evidence supports a view that there is some downward bias in equity beta estimates that are less than 1, and upward bias in equity beta estimates that are greater than 1.

743. Therefore, the Authority was inclined to assume a point estimate for the equity beta that is at the top end of the estimated range, at 0.7, so as to account for potential bias in the estimate, subject to further work to quantify the extent of this potential bias prior to its next decision.

744. The Authority rejects ATCO's consultant SFG's claim that the 0.5 to 0.7 range is an 'arbitrarily selected band'.[352] In the Rate of Return Guidelines, it was clearly stated that:[353]

> The Authority notes that the 95 per cent confidence interval using the bootstrapping procedure falls within the range of 0.3 to 0.72 when an average of the end points for each firm are taken.

745. Furthermore, the Authority noted that:[354]

> The Authority will take into account the outcomes from a range of statistical techniques, including bootstrap analysis, in order to inform the overall observed range of the equity beta.
>
> Based on its analysis, the Authority considers that it is appropriate, at this time, to adopt a range for equity beta from 0.5 to 0.7.

746. That said, the Authority notes that the upper point of the range is 0.7, which is consistent with the upper end of the range determined by the bootstrap analysis conducted by the Authority in the Rate of Return Guidelines. This is omitted from SFG's claim to arbitrariness.

747. Second, the 0.5 figure can be seen as the midpoint of the 0.3 to 0.72 range. Moreover, the Authority took account that the 0.5 figure is consistent with the Authority's equally-

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351 Econometric analysis of beta was conducted in: Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, Chapter 12. Justification and explanation for econometric techniques was provided in Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, Appendix 17, 22 and 23.

352 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 71.

353 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, p. 190.

354 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, p. 162.

weighted portfolio average estimate (0.50),[355] the average value-weighted portfolio estimate (0.49)[356] and the average of the individual firm estimate (0.52).[357] Therefore, the Authority rejects SFG's criticism that the 0.5 to 0.7 range for equity beta is an 'arbitrary range'.

748. The Authority also rejects SFG's criticism regarding the sensitivity of individual equity beta estimates to the methodological choices of regression technique and sampling period. The Authority previously addressed these issues at length in the Rate of Return Guidelines.[358] SFG has ignored this in its analysis, simply restating its previous evidence, with the implication that this refutes the Authority's determined equity beta range. With respect to the varying estimates of Hastings Diversified Fund, DUET and Envestra quoted by SFG, the Authority produced recursive beta estimates of the individual firm betas in the Rate of Return Guidelines, highlighting this issue. Again, this fact is omitted from SFG's submission. The Authority noted there:[359]

> The Authority notes that the beta parameter shows variation through time, regression procedures and across firms. As a consequence, the Authority intends to re-estimate the value for equity beta at the beginning of new access arrangements to incorporate the most relevant information for its decision, using the methodology outlined previously.

749. The Authority will re-apply this methodology at the time of the final decision to determine the equity beta range.

750. Furthermore, the Authority notes that SFG has only submitted individual firm estimates, ignoring the fact the Authority has consistently utilised averages across all of the benchmark sample of firms to inform individual firm beta estimates. In particular, the Authority's 2011 analysis determined an individual firm average range of 0.44-0.60, whilst the updated 2013 analysis determined an individual average range of 0.49-0.52.[360]

751. Moreover, the Authority has consistently reiterated that as a consequence of the statistical imprecision inherent in equity beta estimation, a range of values and regression techniques are necessary in order to inform the permissible range of equity beta values. This acts to mitigate the impact an individual firm's equity beta estimate can have on the determined equity beta estimate. The Authority considers that issues of statistical imprecision are best addressed via the use of multiple models and regression techniques to inform the possible range of equity beta estimates.

752. The Authority addressed the issue of monthly versus weekly returns, in addition to the day of the week effect, at length in the Rate of Return Guidelines. This analysis is ignored by SFG in its submission. In summary, it was noted in the Rate of Return

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355 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, December 2013, Table 24, p. 173.

356 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, December 2013, Table 25 p. 173.

357 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, December 2013, Table 30, p. 183.

358 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, December 2013, Section 12.2.5, Section 12.2.8.

359 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, Table 24, p. 192.

360 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, Table 22, p. 171.

Guidelines that weekly data was preferred to monthly data as a smaller sample would likely reduce the statistical efficiency of the resulting estimate. Furthermore, the use of Friday to Friday returns was suggested by Henry and commonplace throughout the academic literature.[361] Therefore, the Authority rejects SFG's contention that the wide variation in returns caused by changing how the returns are calculated is evidence of instability in the beta estimate.

753. The Authority has previously reiterated the rejection of the use of international comparators in paragraph 739 above, based on the Rate of Return Guidelines analysis.[362] The Authority disagrees with utilising international data to inform a point within the equity beta range.[363] This is a consequence of the Authority rejecting the use of international equity beta data to inform the required equity beta of the domestic benchmark efficient entity. It therefore follows that it has no weight to inform the required equity beta estimate.

754. With respect to the Black CAPM, the Authority rejects SFG's assertion that this implies an equity beta of 1, based on the analysis conducted by NERA.[364] First, the Authority rejected the use of the Black CAPM in the Rate of Return Guidelines, on the basis that its empirical performance was unreliable.[365] Second, the Authority noted in the Rate of Return Guidelines that:[366]

> … the Authority intends to account for empirical evidence relating to potential bias in the estimates of the equity beta that are used in applying the Sharpe Linter CAPM. The Authority considers that such an approach would account for much of the evidence supporting the use of the Empirical and Black CAPM models.

755. The Authority considers that the Black CAPM is only useful to the extent that it suggests a downward bias in the return on equity generated by the Sharp Linter CAPM for firms with an equity beta less than 1. The Authority is of the view that it is difficult to quantify the extent of any downward bias.

756. With respect to the previous access arrangement for the ATCO distribution network adopting an equity beta of 0.8, the Authority considers that this was primarily a consequence of the statistical properties of the equity beta estimates that existed at the time of the previous access arrangement. The Authority considers that the majority of the most recent empirical evidence considered in the Rate of Return Guidelines convincingly demonstrates that the equity beta range of between 0.5 and 0.7 is appropriate.[367] Therefore, the Authority considers that a value of 0.8, which is outside of this estimated range, would be inconsistent with the allowed rate of return objective.

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361 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, Table 24, p. 188.

362 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, Section 12.2.7.

363 The Authority endorses the AER's criticism of the use of international comparators to inform the equity beta range, as outlined in paragraph 802 below. However, the Authority also notes that the AER also has used international data as justification to inform a point estimate at the upper end of the equity beta range (see paragraph 805 below).

364 NERA, *Estimates of the Zero-Beta Premium*, June 2013.

365 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, www.erawa.com.au , December 2013, Appendix 8.

366 Ibid, p. 67.

367 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, Chapter 12.

757. In summary, the Authority remains of the view that an estimate of 0.7 for the equity beta for the benchmark efficient entity is appropriate.

Step 3 – Estimate the return on equity

758. Utilising the Sharpe Lintner CAPM, informed by the point estimates for the parameters identified above, the Authority calculates that the estimated return on equity for a regulatory decision released at 9 September 2014 would be:

> Estimated return on equity = 2.95 per cent + 0.7*(5.50 per cent) = 6.80 per cent

759. The implied return on the market for the average firm with a beta of 1 is 8.45 per cent.

760. The Authority considered models for estimating the return on equity in the Rate of Return Guidelines, and concluded that the Sharpe Lintner CAPM is the only relevant model for estimating the return on equity.

761. The issues raised by ATCO relating to the inclusion of the required return for the average firm are addressed in paragraphs 592 to 679. The issues raised by ATCO relating to value of parameters in the Sharpe Lintner CAPM were addressed in paragraphs 698 to 757.

Step 4 – Consider other relevant material

762. The Authority set out in the Rate of Return Guidelines that it would consider a range of other material as a test for reasonableness of the estimate derived in Step 3.[368]

Other evidence on the risk free rate

763. The estimate of the risk free rate is the 40 day average of the 5 year yield on CGS. As it is observed from the market, the Authority considers that it is robust.

764. The Authority notes that at 2.95 per cent, the indicative estimate is lower than the average of 5-year rates over recent decades, reflecting a concerted downward trend.[369] However, the Authority has no view as to the prospect for significantly higher rates over the next five years. The Authority considers that the prevailing 5 year CGS estimate is the best predictor for the next five years. On this basis, the Authority considers that 2.95 per cent is the best estimate for use in the Sharpe Lintner CAPM.

Other evidence on the market risk premium and the implied market return on equity

765. The Authority set out in the Rate of Return Guideline that it considered that a range of other forward looking information is relevant for determining the point estimate of the MRP (see Appendix 29 – Other relevant material to inform the rate of return for detail).

766. To inform the Authority on the most relevant point within this range, elements of additional information are considered as to whether it implies a revision, upwards or

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368 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 11 – Co-integration between Commonwealth Government bond yields and the cash rates, p. 104.

369 See for example Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 29 – Other relevant material.

downwards, to the estimate of the MRP (see paragraphs 725 to 733 above). In particular, the Authority took account of current information relating to:

- interest swap spreads and debt risk premia;
- dividend yields; and
- measures of market volatility.

767. However, a range of other material is considered relevant which may then provide a cross check:

- views of valuation experts and surveys;
- decisions of other regulators; and
- the relationship between the return on equity and the return on debt.

768. Similarly, the Rate of Return Guidelines also indicated that the determination could take into account relevant other material for checking the implied return on equity for the market, as a means of informing the plausibility of the estimate:

- views of valuation experts and surveys;
- decisions of other regulators; and
- the relationship between the return on equity and the return on debt.

769. A threshold issue in any comparison involves ensuring that estimates are on a consistent 'apples with apples' basis. Key issues in this context involve:

- the term of the estimates; and
- the treatment of imputation.

Term of the estimates

770. As noted above, the Authority is of the view that the term over which return expectations should be assessed is 5 years, so as to match the regulatory period. This is consistent with the Authority's intention to account for the 'present value' principle.[370]

771. The rolling forward looking 5 year return on equity for the market, derived using the 40 day average of the sum of the 5 year government bond rate and the contemporaneous 5 year forward looking estimate of the MRP, using the four indicators, is shown in Figure 29. The resulting composite forward looking estimate of the return on the market using the weighted average method is 8.45 per cent as at 9 September 2014.

[370] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 2.

Figure 29 5 year Forward Looking Return on Equity and Risk Free Rate

Source: Bloomberg and ERA Analysis

772. This 5 year forward looking horizon contrasts with that of independent analysts. Independent analysts tend to adopt a 10 year horizon for the WACC discount rate because they are valuing assets on the basis of the cash flows *to perpetuity*. In Australian financial markets, 10 year government bonds are among the most common 'long maturity' bonds, and thus traditionally have been used as a proxy for the long term to perpetuity. Similarly, analysts estimate the equity premia component over a longer term horizon, involving 10 years or more.

773. A 10 year view tends to 'smooth' out the large, but infrequent spikes in expected risk premia that are more evident in shorter investment horizons. The implication is that risk premia under a 5 year approach are generally lower than the 10 year average, for much of the time. However, the 5 year estimates are more volatile than the 10 year estimates, as they are more sensitive to fluctuations in prevailing market conditions. Over time, the average of the many 5 year observations should converge toward the average risk premium observed under a 10 year approach.

774. For this reason, the 5 year and 10 year estimates are not directly comparable. Rather, the Authority considers it appropriate that all 10 year/perpetual investment horizon type estimates of the return on equity can only be compared to the longer term *average* of the Authority's 5 year forward looking return on equity estimates using its proposed methodology – that is, the average of the historic daily observations of the 5 year forward looking estimate, set out in Figure 29.

775. The average value for the 5 year forward looking return on equity series set out in Figure 29 are shown in Table 43 (column 2), in addition to the daily point estimate as at 9 September 2014 (column 3). The average of the forward looking 5 year return on equity daily estimates over the full 1993 – 2014 period, using the Authority's weighting (refer paragraph 730), is 10.9 per cent (column 2).

Table 43 5 year forward looking return on equity: long term average of daily observations – 1993 to 2014 – and most recent 'on-the-day' observation

Forward Looking Indicator	Average ROE 1993-2014 (%)	5 year ROE as at 9 Sep 2014 (%)	Weight
ASX 200 Volatility Index	9.9	7.9	0.1
All Ordinaries Dividend Yields	11.4	8.9	0.3
Interest Rate Swap Spread	10.7	8.1	0.3
Default Spread	10.8	8.4	0.3
Weighted average	**10.9**	**8.5**	

Source: Bloomberg and ERA Analysis.

776. The corresponding 1993 – 2014 average of the normalised MRP values, using the Authority's weighting is 5.8 per cent (Table 44).[371,372]

Table 44 Long Run MRP Summary Measures – 1999 to 2014

	Mean (%)	Mode (%)	Max (%)	Min (%)
ASX 200 Volatility Index	5.6	5.2	7.5	5.0
All Ordinaries Dividend Yields	5.8	5.8	7.5	5.0
Interest Rate Swap Spread	5.7	5.8	7.5	5.0
Default Spreads	5.7	5.3	7.5	5.0
Weighted average	**5.8**	**5.6**	**7.5**	**5.0**

Source: Bloomberg and ERA Analysis.

777. The Authority considers these 'longer term' average figures are relevant for conducting cross checks, where the reference estimates on the return on equity – such as those of independent analysts – are considering the returns to perpetuity, rather than the 5 year term that is being considered by the Authority.

371 'Normalising' converts the daily point observations of the forward looking measures – such as the ASX 200 Volatility Index – from their position within the (observed) raw historic range, to lie within a 'normalised' range of zero and 1. This 'normalised' position is then applied to the Authority's range for the MRP, of 5 to 7.5 per cent, to develop a corresponding point estimate of the MRP on any day, as given by the forward looking indicator. For more detail, see Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 29, p. 209.

372 The resulting 'longer term' average MRP results sit slightly lower than the long run historic MRP of 6 per cent often cited by independent analysts and previously used in regulatory decisions. This will reflect that high periods of returns between 1965 and 1986 are not in the Authority's indicators series, due to the unavailability of the forward looking indicators prior to 1993.

Brailsford et al's data (see T. Brailsford, J. Handley and K. Maheswaran, 'The Historical Equity Risk Premium in Australia: Post-GFC and 128 Years of Data', *Accounting and Finance,* vol. 52, 2012, pp. 237-247) was used to assess differences in the observed MRP pre-1999 (the date that the three primary indicators in Figure 29 commence) as compared to the period 1999-2010. The long term averages show that prior to 1999, the MRP was around 0.4 to 0.6 per cent higher on average than in the period after. It may also be noted that the implied average MRP from combining the four indicators in Table 3, at 5.8 per cent, is the same as the comparable bonds estimate of Brailsford et al, post 1999 (which the Authority has calculated also gives an estimate of 5.8 per cent).

Treatment of imputation credits

778. A further consideration when comparing estimates relates to the treatment of imputation credits.

779. Longer term average return on equity estimates which include data before 1987 – such as the long term 128 year average historic estimates of Brailsford et al referred to in footnote 371 – will tend to overstate the average observed 'market' return on equity under the current imputation credit regime (that is, the return observed in the market arising from dividends and capital gains).

780. This is because many investors in the post 1987 period receive a proportion of their required return on equity through imputation credits; yet this return is not observed in the market. The return through imputation credits therefore accounts for a proportion of the overall return on equity, all other things equal. Hence the pre-1987 observed return on equity is not comparable to the post 1987 observed return; the latter will be lower due to part of the required return coming from imputation credits which cannot be observed in the market.

781. It is therefore important to 'gross up' any post 1987 observed market return to account for the impact of imputation credits, if the full return on equity is to be accounted for.

782. The amount of the gross up will depend on the assumptions relating to the impact of imputation credits in the Australian capital market. These are captured through the gamma term.

783. As noted by Handley:[373]

- The Officer model typically used to inform returns on equity in Australia under the CAPM has one before company tax and four after company tax WACCs. The four after tax company tax WACCs each differ, based on whether the interest tax shield and the value of imputation credits are included or otherwise in the definition of the corresponding after tax cash flows.
- Officer assumes the CAPM holds when returns are expressed on an 'after company but before personal tax basis'. That is:

  $$X_E = X_E' + \gamma T(X_O - X_D)$$

  where:

  X_O is the firm's operating income (free cash flow) that is ultimately distributed to X_D (that is, to debt claimants), X_E (equity claimants) and X_G (government claimant through the tax rate T);

  $X_E' = (1-T)(X_O - X_D)$ is the cash dividend distributed to equity investors;

  $T(X_O - X_D)$ is the amount of franking credits distributed to investors;

  $\gamma T(X_O - X_D)$ is the proportion of the franking credits distributed to investors.

- X_E is the 'grossed up' value of the returns to investors which includes the value of franking credits. It is consistent with the value on an 'after company before personal

[373] J.C. Handley, *Further comments on the historical equity risk premium*, Report for the Australian Energy Regulator, 14 April 2009, pp. 16-17.

tax basis'. On the other hand, X_E' is consistent with the value on an 'after company after some personal tax' basis.

- The conventional approach to describing a return as 'after company tax' is somewhat misleading in an imputation setting, as company tax paid $T(X_O-X_D)$ consists of a mixture of personal tax $\gamma T(X_O-X_D)$ – being the part rebated against personal taxes – and the effective company tax $T(X_O-X_D)(1-\gamma)$ being the part that is not rebated against personal taxes.
- The Officer CAPM for the Australian imputation tax system is:

  $$k_E = r_f + \beta_e(k_m - r_f)$$

  where

  k_E is the expected grossed up return on equity

  k_m is the expected grossed up return on the market portfolio

  r_f is the risk free rate

  β_e is the beta of the firm.

- Officer assumes the CAPM holds when expected returns are expressed on an 'after company before personal tax basis' that is consistent with X_E.

784. The Authority estimate of the return on equity is the vanilla k_E, derived using Officer's after tax case (iii).[374] The k_E is consistent with X_E, being the return observed in the market inclusive of imputation credits. As set out in paragraph 775, the Authority's longer term average of the estimates of k_E is 10.9 per cent for the period 1993 to 2013.

Views of valuation experts

785. Evidence of market analysts' views suggest that their expectations for the forward average market returns on equity are consistent with the longer term average of the forward looking return on equity estimated using the Authority's methodology.

786. An example is the recent WACC estimate by Grant Samuel used in discounting Envestra's cash flows, which is cited by ATCO's consultant SFG Consulting:[375]

- Grant Samuel's estimate of the return on equity is informed by the Sharpe Lintner CAPM, with the risk premium and risk free rate then adjusted to have regard to a range of other evidence, including that from the Gordon Dividend Growth Model (**DGM**).[376]

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374 J.C. Handley, *Further comments on the historical equity risk premium*, Report for the Australian Energy Regulator, 14 April 2009, pp. 16-17.

375 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 84.

376 Grant Samuel, *Envestra: Financial Services Guide and Independent Expert's Report*, 3 March 2014, Appendix 3.

- Grant Samuel's initial estimate for the *market* return on equity derived using the Sharpe Lintner CAPM is 10.2 per cent. Grant Samuel states that:[377]

> The CAPM is probably the most widely accepted and used methodology for determining the cost of equity capital. There are more sophisticated multivariate models which utilise additional risk factors but these models have not achieved any significant degree of usage or acceptance in practice. However, while the theory underlying the CAPM is rigorous the practical application is subject to shortcomings and limitations and the results of applying the CAPM model should only be regarded as providing a general guide.

- This estimate is based on a long run historic MRP of 6 per cent, which is added to the prevailing 10 year risk free rate of 4.2 per cent. Grant Samuel notes that it:[378]

> …has consistently adopted a market risk premium of 6% and believes that this continues to be a reasonable estimate. It:
>
> - is not statistically significantly different to the premium suggested by long term historical data;
> - is similar to that used by a wide variety of analysts and practitioners (typically in the range 5-7%); and
> - makes no explicit allowance for the impact of Australia's dividend imputation system.

- The Grant Samuel estimate is defined as a 'classical', after tax rate that is based on the estimated nominal ungeared after tax cash flows.[379] On this basis, it is defined consistent with Officer's after tax case (iv).[380] In this case, the k_E is identical to the k_E in case (iii), being the total return on equity from all sources.
- Grant Samuel ultimately assess an overall equity *market* return to be in the range of 10.7 to 15.2 per cent, an estimate that is higher than its CAPM-based estimate, which is 10.2 per cent, as noted above. The higher range accounts for:
  - first, estimates from other return on equity models, such as the Gordon DGM;
  - second, for Grant Samuel's view that equity investors have re-priced risk since the global financial crisis (lifting the MRP above 6 per cent); and
  - third, that bond rates are at unsustainably low levels (which Grant Samuel therefore 'normalise' by increasing the risk free rate from the observed current value around 4 per cent to 5 per cent).[381]

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377 Grant Samuel, *Envestra: Financial Services Guide and Independent Expert's Report*, 3 March 2014, Appendix 3, p. 1.

378 Grant Samuel, *Envestra: Financial Services Guide and Independent Expert's Report*, 3 March 2014, Appendix 3, p. 6.

379 The Authority notes that Grant Samuel's 'classical WACC' differs from the 'nominal vanilla WACC' estimate. The classical WACC reduces the cost of debt to account for the impact of the tax shield (that is, the cost of debt component is D/V*(1-T)*Rd), whereas the nominal vanilla WACC ignores the impact of the tax shield as this is accounted for in the cash flows. However, both approaches adopt the same estimate for the return on equity component (that is, $E/V*k_E$ using Handley's terminology).

380 J.C. Handley, *Further comments on the historical equity risk premium*, Report for the Australian Energy Regulator, 14 April 2009, pp. 16-17.

381 Authority estimate based on Grant Samuel data, assuming a nominal risk free rate of 5.0 per cent.

- As noted above at paragraph 775, the Authority considers that a comparison estimate for the return on the market to perpetuity is the long run average of its return on equity estimates, of 10.9 per cent. This return has an implied long run average risk free rate that is close to the long run estimate of 5.0 per cent adopted by Grant Samuel. It also utilises an implied longer term average of the 5 year estimates of the MRP, of 5.6 per cent.
- The Grant Samuel WACC estimate disavows the impact of imputation credits.[382] The Authority considers that if Grant Samuel did account for the impact of imputation credits, then it would need to adjust its observed return on the market estimate (k_E') accordingly (down).[383] The Authority considers that with a revised assumption of a positive γ, the resulting grossed up return on equity would likely be similar to Grant Samuel's current estimate of k_E, all other things equal.
- The Authority's comparable long run average of its estimates of the 5 year return on equity of 10.9 per cent is within the Grant Samuel range of 10.7 to 15.2 per cent.

787. The survey by ATCO's consultant Ernst and Young of other analysts' estimates gives results that are broadly consistent with the Grant Samuel view. Ernst and Young note that in 2012, independent market experts' market cost of equity estimates averaged 10.7 per cent.[384] Ernst and Young also notes that independent experts typically do not assign a value to imputation credits, and that adjustment for this outcome would raise the estimate of independent brokers.[385] However, the Authority considers that Ernst and Young is incorrect in this view. The 10.7 per cent is an estimate of the total return on equity (k_E), given that independent analysts tend to assume γ=0. As noted in footnote 383, in the event that a positive value was ascribed to gamma, then independent analysts would need to rework their estimation approach.

788. On this basis, the Authority is satisfied that its current estimate, albeit based on a different term, is reasonable.

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382. Grant Samuel, Envestra: Financial Services Guide and Independent Expert's Report, 3 March 2014, Appendix 3, p. 9:

In Grant Samuel's view, however, the evidence gathered to date as to the value the market attributes to franking credits is insufficient to rely on for valuation purposes. More importantly, Grant Samuel does not believe that such adjustments are widely used by acquirers of assets at present… Accordingly, it is Grant Samuel's opinion, that it is not appropriate to make any adjustment.

383 See for example M. Lally, *The Estimation of Gamma*, Report for the AER, 23 November 2013, pp. 33-34:

…the correct position is that, so long as E(Rm) or the MRP exclusive of the credits is correctly estimated, an analyst who does not make any explicit allowance for the credits will still produce valuations that are correct on average over firms because E(Rm) will have fallen after imputation was introduced, and explicit adjustment for the credits is required only to deal with firms that are not typical. Thus the crucial issue is not whether practitioners make an explicit allowance for U but what value for U is embedded in market prices.

…This is the valuation model that would be used by those who don't make any (explicit) allowance for imputation credits anywhere in the formula. However this model will correctly allow for the effect of the credits on the equity value of the average firm, so long as E(Rm) or the MRP is correctly estimated. For firms with a lower than average beta and a higher than average imputation-to-value ratio, the allowance via a lower value for E(Rm) will be insufficient; otherwise, it will be too high. Furthermore, if an analyst believes that U = 0, … it would also be necessary to adjust their estimate of E(Rm) or the MRP to strip out the market's view about U that is impounded in E(Rm), and this would clearly be difficult.

384 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 35, p. 23.

385 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 35, pp. 14-15.

Views of other regulators

789. As noted in the Rate of Return Guidelines, the Authority will consider other regulators' estimates to check outcomes of its own decisions.

790. First, with regard to the AER, the Authority notes that its equity return on the market is derived using the Sharpe Lintner CAPM.

791. Like equity analysts, the AER has the view that a longer term 10 year perspective is appropriate, based on the view that equity investors have long term investment horizons.[386]

792. In line with this view, the AER adopts a different term for the risk free rate in the Sharpe Lintner CAPM. Specifically, the AER adopts:

- a term for the risk free rate of 10 years, with the estimated Commonwealth Government Securities (**CGS**) yield at the time of the guidelines around 4.1 per cent (as compared to the Authority's 5 year CGS yield of 3.4 per cent) – a difference of around 70 bp;
- a range for the MRP of 5.0 per cent to 7.5 per cent, identical to the Authority, with a point estimate of the MRP of 6.5 per cent at the time of the guidelines;[387] and
- a resulting overall estimate of the return on the market of 10.6 per cent (=4.1+6.5).

793. The AER's range for the MRP is consistent with the Authority's. However, the current point estimate of the AER for the long term return on equity is considerably higher than the Authority's. The AER appears to have given greater weight to the DGM estimates, consistent with placing greater weight on a Wright style approach, as well as placing weight on the very long term average of historical estimates.[388]

794. Second, with regard to IPART's estimates, the Authority notes that IPART uses an average of a current 40 day and 10 year term for the risk free rate. IPART proposes to adopt an estimate of the MRP which is informed by a range that is based on a range for historic estimates (5.5 per cent to 6.5 per cent) and a range based on other current market data approaches – including using DGMs – which fall in the range 7.4 per cent to 8.8 per cent, giving an overall range for the MRP of 6.0 per cent to 8.1 per cent (as at 31 July 2014). The mid-point of the assessed range – 7.0 per cent (as at 31 July 2014) – may then be adjusted to account for strong contrary evidence. Given an estimated mid-point risk free rate as at 1 July 2014 of 4.3 per cent, IPART's return on the market is estimated to be around 11.3 per cent.[389]

795. Similar to the AER, the Authority considers that IPART gives more weight to the Wright approach, given its approach of adopting a 10 year term, and choosing the mid-point of the estimated range.

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386 S. Pratt and R. Grabowski, Cost of Capital: Applications and Examples, 4th edition, 2010, pp. 118–120; A. Damodaran, 'What is the risk free rate? A search for the basic building block', December 2008, pp. 9-10. Lally, M., The risk free rate and the present value principle, 22 August 2012. cited in Australian Energy Regulator, Rate of Return Guidelines, Explanatory Statement, p. 49.

387 Australian Energy Regulator, *Explanatory Statement Rate of Return Guideline,* December 2013, p. 93.

388 Australian Energy Regulator, Explanatory Statement: Rate of Return Guideline, December 2013, p. 97.

389 Authority analysis, based on IPART, *Fact sheet – WACC update*, August 2014.

796. Third, ATCO has submitted that the Authority's estimate is considerably lower than that proposed for ATCO Gas (Canada), a gas distribution network, in its recent filing with the Alberta Utilities Commission, for a return on equity of 11.25 per cent.[390] The Authority notes that the Canadian estimate is only a proposal at this stage; at the time of writing the Authority is not aware of any decision by the Alberta Utilities Commission on the proposal.

797. The Authority has considered a range of estimates for the return on equity adopted by overseas regulators at Appendix 3. The comparison indicates:

- The most recent market return on equity adopted by the Alberta Utilities Commission was 10.9 per cent, comprised of a 30 year term risk free rate of 3.6 per cent and a point estimate of the MRP of 7.3 per cent, which was set in December 2011, giving an implied return on the market of 10.9 per cent.[391] The Commission's MRP estimate was set at a time when markets were more volatile – the Authority's 5 year estimate for the MRP in Australia for December 2011 under the approach adopted in this draft decision would have been 6.8 per cent. Overall, given the Alberta Utilities Commission's favouring of 'current' DGM estimates, and the use of the 30 year risk free rate, the Authority considers that the Commission's estimate is best compared to the average of the Authority's longer term estimates of the 5 year return on equity, of 10.9 per cent. On this basis, the underlying estimates are comparable, once the different approaches are accounted for.
- Other regulators' estimates of the MRP fall in the range 5.3 per cent to 9.2 per cent, which provide for a somewhat higher range than the Authority. The reasons for this difference are varied. Ofgem, for example, subscribes strongly to the Wright view, which will tend to drive up the range of the MRP. The Authority also notes that the top end of the range, at 9.2 per cent, is given by the estimate of the Ontario Energy Board, which was set in December 2009, a time just following the Global Financial Crisis. At this time many regulators' estimates – particularly those informed by contemporaneous DGM evaluations – would likely have been pushing upper bounds.

798. In accounting for this evidence relating to the views of other regulators, the Authority considers, first, that its estimate of the risk free rate is appropriate. It is consistent with the term of ATCO's regulatory period, which is five years. This issue was discussed extensively in the Rate of Return Guidelines. It is also consistent with the use of the Australian domestic CAPM, set out in the Rate of Return Guidelines. No material presented by ATCO, nor the views presented in the approaches of other regulators, has changed the Authority's view.

799. Second, with regard to the MRP, the Authority considers that its estimated range – of 5 per cent to 7.5 per cent – is shared with a number of other regulators, including the AER and the Alberta Utilities Commission. The Authority considers that the evidence shows that the Authority has similar metrics relating to the MRP and the return on equity as compared to other regulators, albeit when compared on a consistent longer term basis. The Authority's longer term averages of its estimate for the 5 year return on equity for the market, of 10.9 per cent, is very similar to the estimates of other regulators.

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390 ATCO Gas Australia, Access Arrangement Information: 1 July 2014 – 31 December 2019, 3 April 2014, p. 233.

391 Alberta Utilities Commission, 2011 Generic Cost of Capital, 8 December 2011. Note that the AUC's rate of return was unchanged in 2012 and 2013, and was extended on an interim basis for 2014 pending an update of the overall estimate (Alberta Utilities Commission, 2013 Generic Cost of Capital, 19 December 2013).

800. The Authority therefore is of the view that its current indicators are a reasonable approach to assessing the return on equity, and implicitly the MRP, for the next five years.

Other evidence on equity beta

801. New relevant evidence relating to the Authority's estimate of the equity beta – since the release of the Rate of Return Guidelines – includes:

- the AER's evaluation in its Rate of Return Guidelines; and
- the 2014 study by Professor Henry.

AER equity beta analysis

802. The AER gave primary consideration to Australian empirical estimates in deriving its estimate of equity beta for regulated gas transmission and distribution networks.[392] The AER set out in its Rate of Return Guidelines that it considered that:

- international comparators are less aligned with the benchmark efficient entity compared to Australian comparators, and hence are not relevant for the purposes of estimating the required equity beta range;
- due to differences in regulation of business, and in the nature of the domestic economy, geography, business cycles and weather, there likely would be differences between equity beta estimates for similar businesses between countries;[393]
- as equity beta estimates of international comparators are estimated with respect to the market portfolio of their home market, the resulting equity beta estimate is not a measure of the firm's systematic risk with respect to the Australian market portfolio;
- due to the Australian market portfolio exhibiting a high systematic risk relative to other international markets,[394] the use of international comparators may produce upwardly biased estimates if employed within an Australian CAPM.

803. The AER utilises a range of empirical analysis regarding equity beta estimation to inform its range of 0.4 to 0.7 (Table 45).[395]

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392 Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines,* www.aer.gov.au, December 2013, p. 83.

393 Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines (Appendices),* www.aer.gov.au, December 2013, p. 60.

394 Given that the Australian market portfolio is more volatile relative to other market portfolios, the AER concludes that the Australian market portfolio has a higher systematic risk relative to international market portfolios.

395 Note some averages are calculated by the AER, see: Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines,* www.aer.gov.au, December 2013, p. 87.

Table 45 Equity beta evidence considered by AER

Source	Estimation Period	Individual firm averages	Fixed Portfolios	Varying Portfolios
Henry 2009[396]	2002-2008	0.45-0.71	0.49-0.66	0.43-0.78
ERA 2011[397]	2002-2011	0.44-0.60	-	-
ERA 2013[398]	2002-2012	0.49-0.52	0.47-0.53	-
SFG 2013[399]	2002-2012	0.60	-	0.55

Source: Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines*, www.aer.gov.au, December 2013, p. 87.

804. The AER observed that the range derived from the above empirical analysis represented a decrease from the estimate for beta of 0.8 in its 2009 WACC review.[400] The AER noted that the point estimate of 0.8 was due to the imprecision that existed in equity beta estimation in 2009. Moreover, the AER considered that the empirical evidence in Table 45 convincingly demonstrated that the equity beta range – of between 0.4 to 0.7 – was appropriate, and therefore that a 0.8 value is inappropriate.

805. Using the derived range of 0.4 to 0.7, the AER determined a point estimate of 0.7 based on the following considerations:

- The theory underpinning the Black CAPM predicts that firms with an equity beta of below 1.0 should have a higher return on equity relative to the standard CAPM. This theoretical information suggests selecting a point estimate at the top end of the 0.4-0.7 range. The AER notes that due to estimation issues when using the Black CAPM, the Black CAPM is only used informatively as it is difficult to implement.[401]
- Empirical estimates from a range of international energy networks across the US, UK and Europe support a point estimate at the upper end of the range.[402] The AER reiterated that due to the differences between countries, empirical estimates from

396 O Henry, *Estimating beta*, 23 April 2009.

397 Economic Regulation Authority, *Draft Decision: Western Power Access Arrangement*, March 2012, p. 195.

398 Economic Regulation Authority *Explanatory statement for the draft Rate of Return Guidelines*, 6 August 2013, p. 168.

399 Strategic Finance Group, *Regression-based estimates of risk parameters for the benchmark firm*, 24 June 2013, p. 12.

400 Australian Energy Regulator, , *Better Regulation Explanatory Statement for the Rate of Return Guidelines (Appendices),* www.aer.gov.au, December 2013, p. 60.

401 Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines,* www.aer.gov.au, December 2013, p. 85.

402 The AER perform an analysis of the international comparator companies selected by SFG in: SFG, *Regression-based estimates of risk parameters,* June 2013 p.19. The AER identified exclusive electricity and or gas networks from this sample, and estimated an average equity beta of 0.76, see: Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines (Appendices),* www.aer.gov.au, December 2013, p. 62.

overseas businesses should be interpreted with caution. However, the AER notes that:[403]

> Although we have concerns with the equity beta estimates derived from international comparators, we have considered the US empirical estimates as well as other international estimates before us. They range from 0.5 to 1.3. Recognising the inherent uncertainty caused by the inability to quantify differences between the US and Australia, we consider the analysis of overseas energy networks support the choice of a point estimate in the upper end of our range.

806. The above considerations led to the AER adopting an estimate of the equity beta of the benchmark efficient entity of 0.7.

Professor Henry's 2014 analysis

807. The Authority notes that the expert report, produced by Professor Olan Henry for the AER has recently been released.[404] This largely replicated the methodology from his 2008 and 2009 analysis, updated with more recent pricing data. Given this was released after the formulation of the Rate of Return Guidelines, the Authority was not able to consider it for the determination of the required equity beta of regulated gas networks. The Authority proceeds to do so for the purposes of this decision.

808. First, Henry states his opinion regarding the parametric form of the regression model employed in regression analysis used to estimate the required equity beta. Henry recommends the use of raw returns, as opposed to excess returns in equity beta calculations.[405] This is due to the widespread use of raw returns in the academic literature, in addition to the practical consideration of choosing a suitable proxy for the risk free rate in the calculation of excess returns.[406] The Authority notes that the use of raw returns is consistent with the empirical analysis conducted in the Rate of Return Guidelines.[407]

809. Henry first reports estimation results for the individual firm analyses, concluding that the point estimates of equity beta for individual firms lie, broadly speaking within a range of 0.2 to 0.8, noting that the average point estimates tend to cluster around 0.5, with the median point estimate being approximately 0.4.[408]

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403 Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines (Appendices),* www.aer.gov.au, December 2013, p. 64.

404 O.Henry *Estimating Beta: An Update,* University of Liverpool Management School, April 2014.

405 Raw returns refers to estimating the required equity beta using the observed return of the asset, and the observed return of the market using the following regression model: $r_{it} = \alpha + \beta r_{mt} + \varepsilon_{it}$, where r_{it} is the observed return of the asset, r_{mt} is the observed return of the market. Using excess returns, the required regression equation is $r_{it} - r_{ft} = \beta(r_{mt} - r_{ft}) + \varepsilon_{it}$ where r_{ft} is the observed risk free rate of return at time t. A detailed discussion can be found in: O.Henry *Estimating Beta: An Update,* University of Liverpool Management School, April 2014, p. 6.

406 O.Henry *Estimating Beta: An Update,* University of Liverpool Management School, April 2014, p. 6.

407 Economic Regulation Authority Explanatory statement for the draft Rate of Return Guidelines, 6 August 2013, Chapter 12.

408 O.Henry *Estimating Beta: An Update,* University of Liverpool Management School, April 2014, p. 27.

810. Henry performs robustness checks on the firm beta estimates, in particular the Dimson thin trading tests.[409] Henry finds no statistical evidence of thin trading in the weekly data or monthly data for the individual firms.[410]

811. Henry also conducts Hansen Structural stability tests of the estimated equity beta coefficients. The Hansen stability test tests the null hypothesis that the parameter of interest (in this case beta) is stable, against the alternative hypothesis that the parameter of interest is not stable.[411] The Authority notes that using the last five years of data on the firm beta, only one firm has shown statistical evidence of instability in the firm beta estimate.[412] However, Henry concludes that 'There is no evidence of widespread instability in the estimate of beta across the six firms considered'.[413]

812. Henry next reports equity beta estimates for both equally weighted and value weighted portfolio's constructed using the comparator firms. The Authority has previously explored the details of portfolio construction in the Rate of Return Guidelines.[414] Henry reports that the average and median point estimates of all the portfolio equity beta estimates lie in a range of 0.43 to 0.55.[415] Henry observes that this is consistent with the results of his 2009 analysis.[416]

813. Henry concludes his empirical advice by noting that the point estimate for the equity beta lies in the range of 0.3 to 0.8, based on the range of values encountered across all equity beta estimations. Henry notes however, that the average of the OLS estimates for the individual firms is 0.52 whilst the median estimate is 0.33.

814. In summary, the Authority considers that no new evidence has been presented to contradict the estimated equity beta range determined in the Rate of Return Guidelines, despite SFG's and ATCO's claims that the estimate range does not meet the rate of return objective. The Authority notes that Professor Henry's analysis supports the Authority's view regarding the equity beta range, and suggests a similar range of estimates to the Authority's analysis.

815. The Authority considered in the Rate of Return Guidelines that some relevant empirical evidence supports a view that there exists downward bias in equity beta estimates that are less than one, and upward bias in equity beta estimates that are greater than one. For that reason, the Authority chose the value for equity beta of 0.7, at the upper end of the determined range.

816. The Authority considers that this view remains appropriate. The Authority therefore considers that an equity beta of 0.7 for the ATCO gas distribution network is appropriate for the purposes of this Draft Decision.

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409 The Dimson thin trading test was described by the Authority in : Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, p. 176.

410 O.Henry *Estimating Beta: An Update,* University of Liverpool Management School, April 2014, p. 30.

411 Hansen, B.E (1992) "Parameter Instability in Linear Models", Journal of Policy Modeling, 14(4), 1992, pp. 517-533.

412 SP AusNet, or SPN has shown evidence of parameter instability in the five year period examined.

413 O.Henry *Estimating Beta: An Update,* University of Liverpool Management School, April 2014, p. 33.

414 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, www.erawa.com.au , December 2013, Appendix 21.

415 O.Henry *Estimating Beta: An Update,* University of Liverpool Management School, April 2014, p. 44.

416 O.Henry, Estimating Beta Advic8e to the Australian Competition and Consumer Commission, 2009.

Step 5 – Determine the return on equity

817. Taking into account all of the relevant information, the Authority is of the view that an expected return on equity of 6.80 per cent is appropriate as an estimate for the forward looking 5 year return on equity for the benchmark efficient entity, as at 9 September 2014. This is based on an equity beta of 0.7.

Estimated return on equity = 2.95 per cent + 0.7*(5.50 per cent) = 6.80 per cent

818. The Authority considers that the estimate is commensurate with the efficient equity financing costs of the 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 prevailing at this time. On this basis, the Authority considers that the estimate meets the allowed rate of return objective and the requirements of the NGR and NGL more broadly.

Return on debt

819. The Rate of Return Guidelines outlined that the Authority would base its estimate of the return on debt on a risk premium over and above the risk free rate, combined with a margin for administrative and hedging costs:

Return on Debt = Risk Free Rate + Debt Risk Premium + Debt raising costs + Hedging costs

820. The Authority set out that it would annually update the return on debt, to reflect annual updates to the estimate of the debt risk premium. The other components of the return on debt – the risk free rate and the allowances for debt raising costs and hedging costs – would be set once, at the start of the regulatory period, and apply unchanged for each subsequent regulatory year in the regulatory period.

821. The risk free rate will be based on the observed yield of a 5-year term Commonwealth Government Security, averaged over a 40 day period just prior to the regulatory period. This rate will apply in each regulatory year. The 5-year term reflects the present value principle that the term of debt should match the regulatory update period, which is five years.

822. The Authority set out that the debt risk premium will be derived from the yield to maturity of an observed sample of bonds issued by comparator firms with similar credit ratings as the benchmark efficient entity. The Authority determined to update the debt risk premium annually, in recognition that it is difficult for firms to manage risk related to changes in this component of debt, given the lack of hedging instruments. The Authority set out that it would use its bond yield approach to estimate the cost of debt/the debt risk premium.

823. As considered in detail in the Rate of Return Guidelines, the Authority considers that the on-the-day approach is more efficient than the trailing average approach because it is a better forward predictor of the prevailing interest rate for each year of the regulatory period.[417]

[417] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, p. 71.

Risk free rate

824. The Authority considers that a 5 year term for the risk free rate is consistent with the 'present value principle', and with investors' horizons with regard to the regulated assets, given the 5-year regulatory period (see paragraphs 648 to 652). The Authority therefore does not accept ATCO's proposal to base the risk free rate on a term of 10 years.

825. The indicative average of the observed 5-year Commonwealth Government Securities (**CGS**) risk-free rate as at 9 September 2014 was 2.95 per cent. This provides a point estimate for the risk free rate.

826. The Rate of Return Guidelines determined that the risk free rate will be set once, at the start of the regulatory period, and apply unchanged for each subsequent regulatory year in the regulatory period. ATCO has not objected to this approach.

Credit rating

827. The Authority notes ATCO's acceptance of the Authority's methodology and the determination of the credit rating for the benchmark efficient entity set out in the Rate of Return Guidelines.[418] For the purpose of this Draft Decision the benchmark credit rating is assumed to encompass the BBB-/BBB/BBB+ credit band.

The term of the debt risk premium

828. The present value 'NPV=0' principle is a key consideration in establishing the estimate of the rate of return, as detailed in the Rate of Return Guidelines.[419] The Authority maintains this view. This means that, for the return on debt, the term of the risk-free rate is five years, consistent with the term of a regulatory period. The present value principle also requires that the five year term be applied to the debt risk premium (in the return of debt) and the equity risk premium (in the return on equity).

829. However, the Authority noted in the Rate of Return Guidelines that the term of five years for the cost of debt will only satisfy the present value principle provided that there are financial instruments available in the market that firms can use to hedge both components of the cost of debt (that is, the risk free rate and the debt risk premium). While the risk free rate can be entirely hedged by firms, the Authority acknowledged that it may not be possible for the debt risk premium to be efficiently hedged due to the absence of a liquid credit default swaps market in Australia. In line with the analysis of Lally relating to this scenario, the Authority determined therefore to base the debt risk premium on the average remaining term to maturity of the debt held by the benchmark efficient firm.[420]

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418 Economic Regulation Authority, *Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, 16 December 2013, p. 19.

419 Economic Regulation Authority, Appendices to the Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, www.erawa.com.au , December 2013, p. 17.

420 Economic Regulation Authority, Appendices to the Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, www.erawa.com.au , December 2013, p. 30.

830. ATCO submitted that use of term *at issuance*, rather than average remaining term to maturity determined by the Authority, is supported by the analysis of Lally, analysis by its consultant CEG, and also the AER.[421] On this basis, ATCO proposed a term of debt of 10 years.

831. The Authority engaged Lally to clarify this issue. Lally's advice makes clear that, absent credit default swaps, the Authority should estimate the debt risk premium based on the average term at issuance.[422] The Authority notes that analysis in the Rate of Return Guidelines would support a term at issuance for the benchmark efficient entity of around 10 years.[423]

832. Therefore, the Authority accepts that it is appropriate to adopt the 10 year term for its estimate of the debt risk premium.

Estimating the debt risk premium

833. As a result of the credit default swap issues discussed in the previous section the Authority's preference is to implement the cost of debt in accordance with the methodology outlined in Lally's advice to the Queensland Competition Authority (**QCA**) in 2010.[424]

834. Lally outlined a debt management strategy for regulated entities to convert the 10 year debt risk premium to a 5 year premium in light of the difficulties associated with using credit default swaps:[425]

> The third option would also only arise if the average debt term used by relevant comparator firms materially exceeded five years. Again, for example, we suppose that the average debt term is ten years. In this event, the third option would be to assume that regulated firms will borrow for ten years and use interest rate swap contracts to effectively convert the ten year risk free rate that is embedded in their average debt term into the five year risk free rate. However, they would not be assumed to use credit default swaps to convert the ten year debt premium that was embedded in their average debt term into a five year debt premium (due to the difficulties in doing so). In this event, the total costs of debt that should be allowed every five years would be the five year risk free rate, the ten year debt premium, the annualised debt issue costs arising from ten yearly debt issues, and the transaction costs of the interest rate swap contracts (in the form of the spread between the "mid rate" and the price).

Estimating the 10 year debt risk premium

835. ATCO proposes, and the Authority now accepts, a term of 10 years for the estimate of the debt risk premium.

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421 ATCO Gas Australia, Access Arrangement Information: 1 July 2014 – 31 December 2019, 3 April 2014, p. 255.

422 M. Lally, *The Cost of Debt*, 27 August 2014, p. 13.

423 Economic Regulation Authority, Appendices to the Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, www.erawa.com.au , December 2013, p. 39.

424 M.Lally, *The Appropriate Term for the Risk Free Rate and the Debt Margin*, Report for the Queensland Competition Council, April 2010.

425 M.Lally, *The Appropriate Term for the Risk Free Rate and the Debt Margin*, Report for the Queensland Competition Council, April 2010, p. 11.

836. ATCO proposes to estimate the debt risk premium based on the Reserve Bank of Australia's (**RBA**) newly developed estimates of credit spreads.[426]

837. The Authority evaluated two approaches for estimating the 10 year debt risk premium:

- the RBA credit spread estimates, as proposed by ATCO; and
- the Authority's bond yield approach, augmented to allow estimation of a yield curve.

The RBA's corporate credit spread

838. The Authority notes the availability of the RBA's estimates of corporate credit spreads, at the targeted tenor of 10 years, for the A-rated and BBB credit rating bands.[427]

839. The RBA announced its credit spread estimates after the release of the Rate of Return Guidelines.[428] The estimates therefore constitute relevant new information not previously considered by the Authority. The credit spreads are estimated with respect to both contemporaneous estimates of the return on Commonwealth Government Securities and Bank Bill Swap rates, at various target tenors. They provide one potential approach to estimating the debt risk premium for the BBB band, at 10 year target tenor.

840. A starting point for the RBA's estimation approach is the development of the samples of Australian corporate bonds that are used to estimate the spreads for the A and BBB credit rating bands respectively. The RBA adopts the following selection criteria to filter the corporate bonds for each of the respective benchmark samples:[429]

- a credit rating of A-rated band or BBB-rated band;
- a remaining term to maturity of 1 year or longer;
- an amount at issuance of A$1 million or greater;
- inclusion of bonds denominated both in Australian dollars and foreign currencies; including US dollars and Euros;
- inclusion of bullet bonds and bonds with embedded options, such as callable bonds; and
- all bonds identified by Bloomberg that were outstanding after 1 January 1990 and were issued by non-financial corporates (**NFCs**) incorporated in Australia.[430]

841. Once the benchmark sample is developed, the aggregate credit spreads for A-rated and BBB-rated Australian NFCs are estimated for a given target tenor as the weighted

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426 Reserve Bank of Australia, *Interest rates: aggregate measures of Australian corporate bond spreads and yields*, Table F3, www.rba.gov.au/statistics/tables/index.html.

427 Reserve Bank of Australia, *Interest rates: aggregate measures of Australian corporate bond spreads and yields*, Table F3, www.rba.gov.au/statistics/tables/index.html.

428 Reserve Bank of Australia, 'New Measures of Australian Corporate Credit Spreads', *Bulletin*, December quarter 2013.

429 Reserve Bank of Australia, 'New Measures of Australian Corporate Credit Spreads', *Bulletin*, December quarter 2013.

430 Non-financial corporations are identified based on their classification by Bloomberg in a group other than banking, commercial finance, consumer finance, financial services, life insurance, property and casualty insurance, real estate, government agencies, government development banks, governments regional or local, sovereigns, supranationals and winding-up agencies.

average of the Australian dollar equivalent credit spreads over the swap rate. The method is applied to the cross-section of bonds in the sample that have the desired credit rating.

842. The RBA estimates are determined by the Gaussian kernel method. This approach assigns a weight to every observation in the bond sample – informed by the distance of the observation's residual maturity from the target tenor – according to a Gaussian (normal) distribution centred at the target tenor.[431] The RBA notes that this method recognises that the observed spreads on bonds with residual maturities close to the target tenor contain more information about the underlying spread at that tenor than spreads on bonds with residual maturities further away. The RBA also argues that:[432]

> The advantage of the Gaussian kernel over parametric methods that have been popularised in the literature on the estimation of government yield curves, is its simplicity. Also, it does not impose a particular functional form on the credit spread curve but allows the observed data to determine its shape.[433]

843. Formally, the Gaussian kernel average credit spread estimator $S(T)$ at target tenor T (say, 5 years) for a given broad rating (say, BBB-rated bonds) and date is:

$$S(T) = \sum_{i=1}^{N} w_i(T;\sigma) \times S_i$$

where:

- $w_i(T;\sigma)$ is the weight for the target tenor T of the ith bond in the sub-sample of bonds with the given broad rating; and
- S_i is the observed spread on the ith bond in the sub-sample of N bonds with the given broad rating.
- The parameter σ (sigma), which is measured in years, controls the weight assigned to the spread of each observation based on the distance between that bond's residual maturity and the target tenor. Sigma is the standard deviation of the normal distribution used to assign the weights. It determines the effective width of the window of residual maturities used in the estimator, with a larger effective window producing smoother estimates.

844. The weighting function is as follows.

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431 Reserve Bank of Australia, 'New Measures of Australian Corporate Credit Spreads', *Bulletin*, December quarter 2013, p. 20.

432 Reserve Bank of Australia, 'New Measures of Australian Corporate Credit Spreads', *Bulletin*, December quarter 2013, p. 20.

433 A number of estimation methods were investigated. These methods produced very similar estimates of credit spreads across tenors and broad credit ratings. These methods included a range of parametric models estimated by least squares regressions applied to the cross-section in each period. In particular, the Nelson and Siegel (1987) method was examined in detail owing to its wide use in practice for estimating government yield curves (BIS 2005); this method has also been adapted for the estimation of corporate bond yield and spread curves (Xiao 2010). However, the RBA notes that in its sample these models displayed spurious statistical properties, producing very high model fit but largely statistically insignificant coefficients. Other studies have also found evidence of possible over-fitting of the data using parametric methods, particularly in the case of the Nelson and Siegel model.

$$w_i(T;\sigma) = \frac{K(T_i - T;\sigma) \times F_i}{\sum_{j=1}^{N} K(T_j - T;\sigma) \times F_j}$$

where:

- $K(T;\sigma)$ is the Gaussian kernel function giving weight to the ith bond based on the distance of its residual maturity from the target tenor $(|T_i - T|)$.
- F_i is the face value of the ith bond.

845. The Gaussian kernel is finally defined as below:

$$K(T_i - T;\sigma) = \frac{1}{\sqrt{2\pi}\,\sigma} \exp\left[-\frac{(T_i - T)^2}{2\sigma^2}\right]$$

846. The Gaussian kernel method provides for a degree of flexibility in weighting the observations around the target tenor through the choice of the value of the smoothing parameter, σ.

847. The RBA then selects a smoothing parameter of 1.5 years for both A-rated bonds and BBB-rated bonds.

848. The RBA concluded that the Gaussian kernel method produces effective weighted average tenors that are very close to each of the target tenors. The exception is the 10 year tenor, where the effective tenor is currently 8.6 years. The RBA argues that this difference reflects the dearth of issuance of bonds with tenors of 10 years or more.

849. The Authority has evaluated the estimates developed by the RBA and has concerns that they are not the best means to deliver on the allowed rate of return objective.

850. First, the Authority is of the view that there is a need for consistency in the term estimates (that is, the estimates for the target tenors). The Authority notes that the RBA approach does not necessarily achieve this outcome, particularly at the 10 year target tenor. As noted above, the RBA method produces an estimate that is 8.6 years.

851. Second, the Authority notes that the RBA estimates are only available for the BBB and A bands. However, Australian economic regulators, including the Authority, have adopted various other combinations of credit ratings for their regulatory decisions. The Authority considers it should not be constrained in its credit rating evaluation by a limited set of estimates of the related debt risk premia, as this may not be consistent with the requirements of the NGR, or the allowed rate of return.

852. Third, the RBA estimates are reported as the month-end estimates of the debt risk premium using relevant swap rates or Commonwealth Government Security (**CGS**) rates. The resulting estimates are less than ideal because Australian regulatory practice is to adopt an average over a period between 20 or 40 trading days, so as to avoid significant fluctuation of the estimates on any particular day.

853. On this basis, the Authority is of the view that it is more appropriate to develop its own yield estimates. To this end, the Authority has extended its bond yield approach with two additions: (i) the benchmark sample is extended to recognise the importance of Australian bonds denominated in foreign currencies; and (ii) various curve fitting

techniques are adopted to allow the estimation of the debt risk premium at various tenors.

Extending the benchmark sample for the bond yield approach

854. In its bond yield approach discussion paper in December 2010, the Authority considered the trade-off between the 'market relevance' and the 'accuracy' of the approach to be adopted in estimating the proxy for the cost of debt/the debt risk premium for a benchmark sample of Australian corporate bonds.[434] The Authority considered that a bond price (or its observed yield) is determined by the markets, not by the companies or the regulators. As a result, the Authority was of the view that relying on market data will provide the best means of estimating the proxy for the cost of debt. This means that observed bond yields play a fundamental role in the method of estimation.

855. In addition, the Authority places emphasis on market relevance. This takes account of the fact that new bond issuers consider the prevailing market conditions prior to the issuance of the bonds. In particular, issuers will consider issuing longer term bonds in a 'normal' market situation, whereas shorter term bonds may be more appropriately issued during very unstable market conditions. As a result, the observed yields of bonds currently traded in the market will reflect the nature of the prevailing market conditions prior to the issuance of the bonds.

856. The Authority notes that firms are increasingly choosing to issue Australian bonds denominated in offshore markets and currencies.[435] As long as the majority of bond issuances of the various markets and currencies can be captured, then the associated outcomes are 'market relevant', and ideally should be included in the benchmark sample.

857. The decision to issue bonds in the Australian or overseas financial markets lies with businesses. There may be a cost advantage in issuing bonds overseas taking into account all possible risks associated with the process such as exchange rate risk. Alternatively, it may be more convenient to issue longer term bonds and/or bonds with larger amounts at issuance in overseas markets given the Australian financial market is generally considered a smaller market in comparison with the US, European, and UK markets.

858. An initial search on the Bloomberg terminal, as at 18 June 2014, indicates that Australian corporate bonds are largely denominated either in Australian dollars, US dollars (**USD**), Euros, or British pounds (**GBP**).

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434 Economic Regulation Authority, *Measuring the debt risk premium: bond-yield approach*, 30 November 2010.

435 Reserve Bank of Australia, 'New Measures of Australian Corporate Credit Spreads', *Bulletin*, December quarter 2013, p. 16.

Table 46 Australian corporate bonds denominated in various currencies

Currency	No of bonds	Percentage	Amount (in relevant currency)	Exchange rate as at 18 June 2014	Amount (in A$)	Percentage
AUD	74	39%	20,531,775,500	1.0000	20,531,775,500	21%
CAD	2	1%	521,370,000	1.0148	513,766,259	0.52%
CHF	3	2%	492,910,000	0.8399	413,995,109	0.42%
EUR	14	7%	10,805,920,000	0.6893	15,676,657,479	15.81%
GBP	12	6%	6,196,342,000	0.5504	11,257,888,808	11.36%
JPY	2	1%	109,813,500	95.4700	1,150,241	0.0012%
NZD	3	2%	771,090,000	1.0778	715,429,579	0.72%
SGD	1	1%	217,903,000	1.1704	186,178,230	0.19%
USD	78	41%	46,539,000,000	0.9337	49,843,632,859	50.28%
Total	**189**	**100%**	**86,186,124,000**		**99,140,474,063**	**100%**

Source: ERA analysis based on data obtained from Bloomberg and the RBA (for exchange rate), June 2014

859. The above table indicates that if only Australian corporate bonds denominated in Australian dollars are included in the benchmark sample, then only 39 per cent (in terms of number issued) and 21 per cent (in terms of value at issuance) of bonds are covered. However, when foreign currencies such as USD; Euros; and GBP are included, the benchmark sample captures relevant information relating to 93 per cent of all debt (in terms of the number of bonds issued) and 98 per cent of all debt (in terms of the amount at issuance).

860. It is clear then that the majority of Australian corporate bonds are denominated in foreign currencies.[436] Furthermore, overseas markets have assumed greater importance for the longer end of the yield curve.

861. In conclusion, the Authority considers that Australian corporate bonds denominated in selected foreign currencies should be included in the benchmark sample, given the changing nature of debt markets, and the clear trend to foreign issuance. Doing so will increase the sample size of the benchmark sample, which leads to a more robust estimate of the debt risk premium.

862. The Authority will include Australian bonds denominated in USD; Euros; and GBP in the benchmark sample under its bond yield approach. The Authority notes that as at August 2014, bonds denominated in AUD; USD; Euros and GBP cover the majority of debt issued by Australian corporates. Should the debt market evolve in the future and other currencies play a more significant role, the choice of currencies may need to change. The Authority considers that provided the bond sample covers at least 90 per cent of both the number of bonds and the amount at issuance, then its estimates are likely to be sufficiently representative of actual debt issuing practices.

863. As a further consideration, the Authority notes that it is standard practice to exclude firms operating in the financial sector, because these firms have a different capital structure.[437] Exclusion of bonds issued by firms in the financial sector may reduce the sample size. However, given the approach to include bonds denominated in foreign currencies, this reduction in the sample size does not have an effect on the robustness of the estimates.

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436 Reserve Bank of Australia, 'New Measures of Australian Corporate Credit Spreads', *Bulletin*, December quarter 2013, p. 17.

437 The Authority notes that the RBA estimates exclude financial sector bonds.

864. In summary, the Authority considers that it is appropriate to include Australian corporate bonds denominated in key foreign currencies in the benchmark sample, as well as domestic issuance in Australian dollars. The Authority also considers it appropriate to exclude bonds issued by financial entities. The resulting sample approach of the Authority then bears similarities to that of the RBA corporate credit spread approach (Table 47)

Table 47 A comparison: the ERA's bond sample approach versus the RBA's approach

Criteria	ERA's approach	RBA's approach
Remaining term	> 2 years	> 1 year
Amount at issuance	N/A	A$100 million
Denominated currency	AUD, USD, EUR and GBP	AUD; USD and EUR
Industry of issuers	Non-financial corporates only	Non-financial corporates only

Source: ERA analysis

Techniques to estimate the debt risk premium

865. The Authority investigated methods for the purpose of estimating the debt risk premium at tenors beyond 5 years.

866. The Authority notes that there are different curve fitting techniques that could be used for this purpose. However, the following three techniques are widely used:

- the Gaussian Kernel;
- the Nelson-Siegel methodology; and
- the Nelson-Siegel-Svensson methodology.

867. Each of these techniques is discussed in turn below.

Gaussian Kernel

868. This methodology was discussed in detail previously under the discussion of the RBA's approach.

The Nelson-Siegel methodology

869. The Nelson-Siegel methodology assumes that the term structure of the DRP has the following parametric form:

$$y_t(\tau) = \beta_{0t} + \beta_{1t}\frac{1-\exp(-\lambda\tau)}{\lambda\tau} + \beta_{2t}\left(\frac{1-\exp(-\lambda\tau)}{\lambda\tau} - \exp(-\lambda\tau)\right)$$

where:

$y_t(\tau)$ is the credit spread (debt risk premium) at time t for maturity τ ; and

$\beta_{0t}, \beta_{1t}, \beta_{2t}, \lambda$ are the parameters of the model to be estimated from the data.

870. The Nelson-Siegel methodology uses observed data from the bond market to estimate the parameters $\beta_{0t}, \beta_{1t}, \beta_{2t}, \lambda$ by using the observed debt risk premium and maturities for bonds. With the estimated parameters $\beta_{0t}, \beta_{1t}, \beta_{2t}, \lambda$, a yield curve is produced by substituting these estimates into the above equation and plotting the resulting *estimated* debt risk premium $\hat{y}(\tau)$ by varying the maturity τ. $\hat{y}(\tau)$ has the interpretation of being the *estimated* debt risk premium for a benchmark bond with a maturity of τ for a given credit rating.

The Nelson-Siegel-Svensson methodology

871. The Nelson-Siegel-Svensson yield curve fitting method is an extension to the Nelson-Siegel method. The following parametric form is fitted by minimizing the sum of squared residuals between the fitted form and the bond yield observations:[438]

$$\hat{y}(\tau) = \beta_0 + \beta_1 \frac{1 - e^{-\tau\lambda_1}/\lambda_1\tau}{\lambda_1\tau} + \beta_2\left[1 - e^{-\tau\lambda_1}/\lambda_1\tau - e^{-\tau\lambda_1}\right] + \beta_3\left[1 - e^{-\tau\lambda_2}/\lambda_2\tau - e^{-\tau\lambda_2}\right]$$

where:

$\hat{y}(\tau)$ is the estimated yield as a function the remaining term to maturity τ; and

$\beta_0, \beta_1, \beta_2, \beta_3, \lambda_1$ and λ_2 are the estimated parameters that result in the minimum sum of squared residuals.

872. The estimated function can then be used to calculate yields, or in the present case, the spreads to swap, based on a given term to maturity as an input.

Using the ERA's revised bond yield approach to estimate the regulated debt risk premium

873. On the basis of the above considerations, the Authority has determined that it will utilise a revised bond yield approach for the purpose of estimating the regulated debt risk premium.

874. To estimate the regulated debt risk premium, the Authority will:

- extend the benchmark sample under the bond yield approach to: (i) include Australian corporate bonds denominated in domestic currency (**AUD**) and foreign currencies including USD; Euros; and British pounds; and (ii) exclude bonds issued by financial sectors including banks;
- estimate the credit 'spread to swap' for each bond, in terms of the denominated currency, as a first step in estimating the regulated debt risk premium;

438 M. Dahlquist and L.Svensson, 'Estimation of the Term Structure of Interest Rates with Simple and Complex Functional Forms: Nelson & Siegel vs. Longstaff & Schwartz', *Institute for International Economic Studies, Seminar Paper Number 565,* February 1994.

- convert the resulting spread to swap for each bond to AUD terms, by accounting for hedging costs;
- estimate a credit spread to swap yield curve in AUD equivalents – applying the Gaussian Kernel, the Nelson-Siegel and the Nelson-Siegel-Svensson techniques.
- use the simple average of these 3 yield curve's 10 year spread to swap estimate to arrive at the final estimate of the 10 year spread to swap;[439]
- estimate the regulated debt risk premium for the purposes of estimating the cost of debt (see paragraph 890).

875. The following sections summarise these steps in more detail.

Step 1: Determining the benchmark sample

876. The criteria set out in the Rate of Return Guidelines to determine the benchmark sample in the Authority's bond yield approach has been revised. The following characteristics will be applied to select corporate bonds to be included in the benchmark sample:[440]

- credit rating of each bond must match that of the benchmark efficient entity, as rated by Standard & Poor's;
- time to maturity of 2 years or longer;
- bonds issued where the country of risk is Australia (except by the financial sector) and denominated in AUD; USD; Euros; and GBP;[441]
- inclusion of both fixed bonds[442] and floating bonds;[443]
- inclusion of both bullet and callable/ putable redemptions;[444] and
- at least 50 per cent of observations for the averaging period is required (that is, 20 yield observations over the required averaging period of 40 trading days are required).[445]

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439 The Authority intends to adopt the average, because there is no strong evidence to suggest that one approach outperforms the others. It is likely that the average will show less variability under a range of prevailing conditions.

440 Economic Regulation Authority, *Discussion Paper – Measuring the Debt Risk Premium: A Bond Yield Approach*, December 2010 p. 11.

441 Country of risk is based on Bloomberg's methodology using four factors listed in order of importance; management location, country of primary listing, country of revenue and reporting currency of issuer. This criteria allows for the largest sample of bonds that reflect an Australian risk premium.

442 This is a long term bond that pays a fixed rate of interest (a coupon rate) over its life.

443 This is a bond whose interest payment fluctuates in step with the market interest rates, or some other external measure. Price of floating rate bonds remains relatively stable because neither a capital gain nor capital loss occurs as market interest rates go up or down. Technically, the coupons are linked to the bank bill swap rate (it could also be linked to another index, such as LIBOR), but this is highly correlated with the RBA's cash rate. As such, as interest rates rise, the bondholders in floaters will be compensated with a higher coupon rate.

444 A callable (putable) bond includes a provision in a bond contract that give the issuer (the bondholder) the right to redeem the bonds under specified terms prior to the normal maturity date. This is in contrast to a standard bond that is not able to be redeemed prior to maturity. A callable (putable) bond therefore has a higher (lower) yield relative to a standard bond, since there is a possibility that the bond will be redeemed by the issuer (bondholder) if market interest rates fall (rise).

445 The Authority notes that there is a tendency for fewer bonds to be available on the long end of the yield curve. If circumstances arise where this criteria results in a paucity of bonds such that curve fitting is

877. As at 9 September 2014, 102 Australian corporate bonds met the revised criteria and were included in the benchmark sample.[446] The benchmark sample of bonds is listed at Appendix 5.

Step 2: Estimate the spread to swap in the denominated currency and in AUD terms

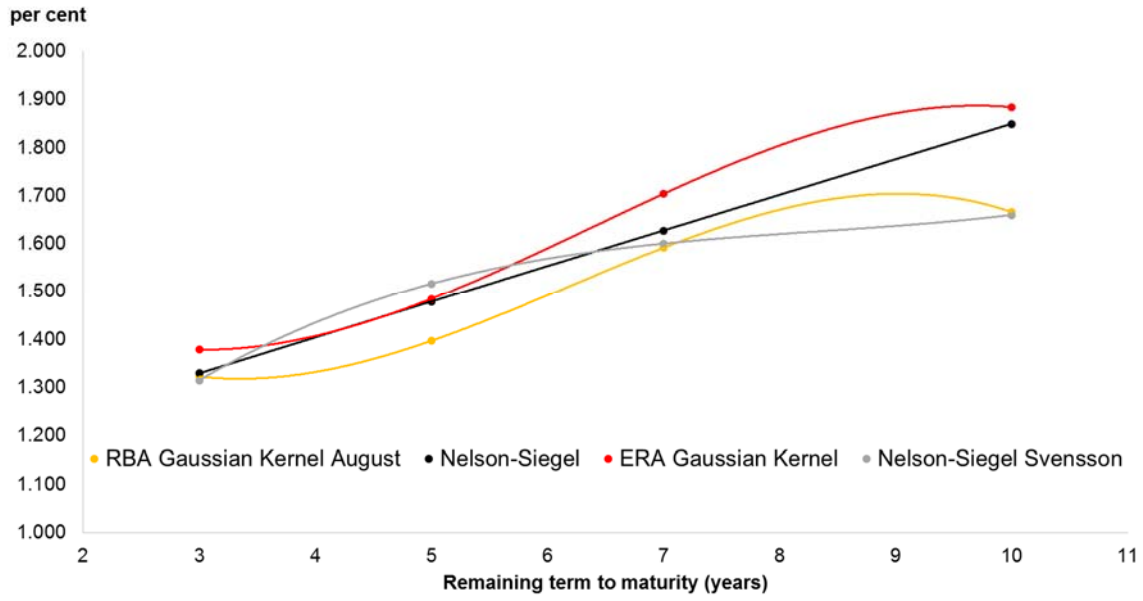
878. The Authority will estimate the 'spread to swap' for each bond. The relevant basis swap rate is the interest rate swap – of equivalent tenor to the yield to maturity of each bond in the extended benchmark sample – in the denominated currency of each bond. Subtracting this swap rate from the bond yield isolates the credit spread, giving the 'spread to swap' in the denominated currency.

879. This denominated currency credit spread is then converted to AUD terms by accounting for hedging costs.[447]

Step 3: Apply curve fitting techniques

880. All three curve fitting techniques, including (i) Gaussian Kernel methodology; (ii) the Nelson-Siegel methodology; and (iii) the Nelson-Siegel-Svensson methodology, are used to determine yield curves for the benchmark sample. Figure 30 below presents the fitted yield curves using the three different methodologies, as well as the RBA's Gaussian Kernel approach for comparison.

Figure 30 Fitted yield curves using different methodologies



Source: Economic Regulation Authority's analysis

impractical the Authority may exercise judgement to determine whether exclusion of bonds based on this criteria is appropriate.

446 The observed (indicative 7 day average) yields for all bonds included in the benchmark sample for the period of 7 trading days ending on 9 September 2014 are sourced from Bloomberg.

447 The Authority accounts for the cross-currency basis swap and the interest rate swap, as per the RBA's method, but not the conversion factor. The cross-currency basis swap is generally the most significant hedging cost. See Reserve Bank of Australia, 'New Measures of Australian Corporate Credit Spreads', *Bulletin*, December quarter 2013, p. 25.

881. A summary of spreads to swap for the BBB-rated band at various terms of 3; 5; 7; and 10 years is presented in Table 48 below.

Table 48 Spreads to swap in equivalent Australian Dollar: BBB-rated band 40 trading average as at 31 July 2014

Term (Years)	3	5	7	10
ERA Gaussian Kernel	1.378	1.484	1.704	1.884
Nelson-Siegel	1.329	1.479	1.628	1.849
Nelson-Siegel Svensson	1.315	1.516	1.600	1.660
Average	**1.341**	**1.493**	**1.644**	**1.798**
RBA Gaussian Kernel (August 2014)	1.322	1.397	1.592	1.666

Source: Economic Regulation Authority's analysis

882. The values in column 4 of Table 48 present the estimated 10 year spread to 10 year interest rate swaps (**IRS**) for the extended benchmark sample.

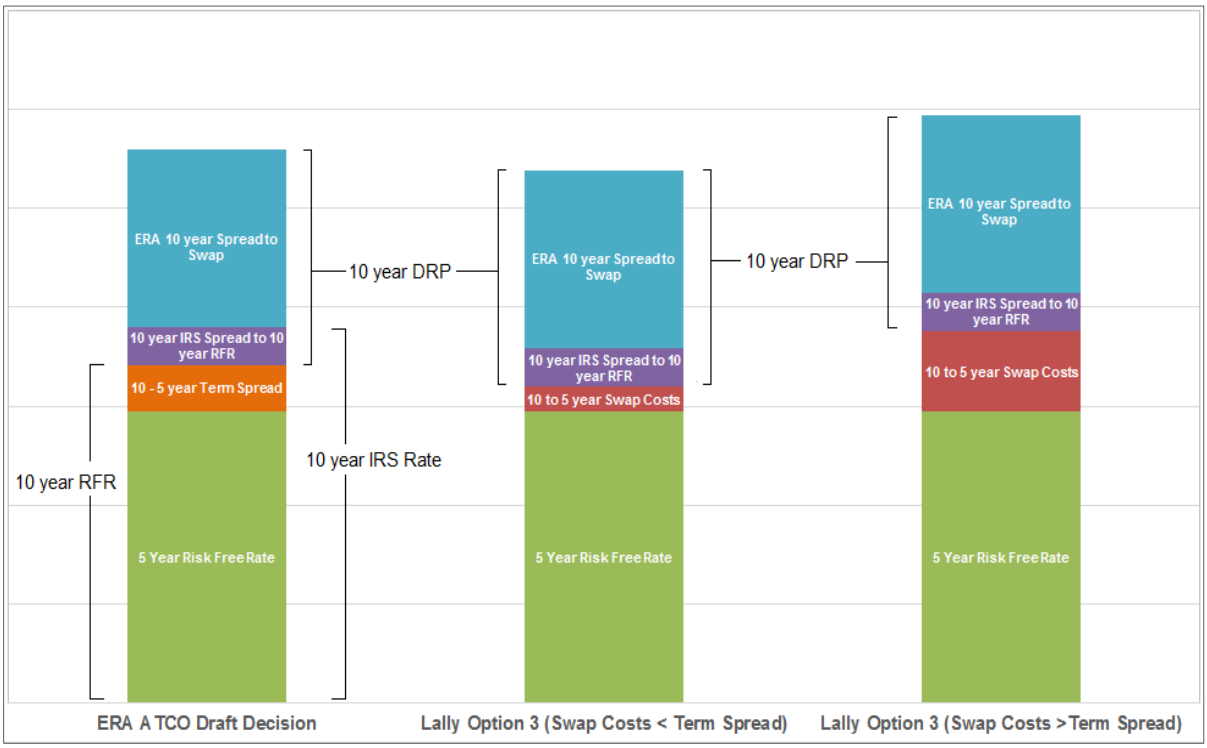
Step 4: Estimate the regulatory debt risk premium

883. Given the current absence of a liquid Credit Default Swaps market in Australia, and consistent with Lally's option 3, the Authority is of the view that the term of the debt risk premium needs to be set at 10 years (see paragraph 832).[448] To this end, the Authority has developed estimates of the 10 year spread to swap (see the preceding section). However, there is a need to estimate a regulatory debt risk premium – with a term of 10 years – that accords with the intention to set the risk free rate on the basis of Commonwealth Government Securities with a five year term.

884. First, there is a need to account for the difference between the IRS rate and the risk free rate (**RFR**) on Commonwealth Government Securities (**CGS**). Adding the '10 year IRS spread to 10 year RFR' (purple segment in Figure 31) to the 10 year spread to swap (blue segment Figure 31) gives the 10 year debt risk premium (**DRP**) – this is shown in each bar in Figure 31. The 10 year DRP is thus defined as the credit spread to the 10 year risk free rate, rather than the spread to 10 year IRS.

[448] The Authority will reassess the conditions for this CDS market in future decisions. Should this market return to more normal conditions, then the term for estimating the spread to swap would be revised to 5 years in order to be consistent with the term of the risk-free rate and the 'NPV = 0' present value principle.

Figure 31 Decomposition of the Cost of Debt under the 'Term Spread' and 'Swaps' Approaches to determining the Regulated Debt Risk Premium



Source: Economic Regulation Authority

885. Second, there is a need to account for the difference between the 10 year risk free rate, and the five year risk free rate used in estimating the regulated cost of debt (recalling that the Authority is basing the risk free rate on the five year CGS risk free rate - see paragraph 824). To this end, two alternative methods require consideration, whether to adopt a:

- term spread approach – adding the 10 year DRP to the 5 year risk free rate and 10 - 5 year term spread (in orange as shown in the first bar in Figure 31) – this would be consistent with ATCO's proposal;[449] or
- swaps approach – adding the 10 year DRP to the 5 year risk free rate and 10 to 5 year swap costs (shown in red in the second and third bar in Figure 31) – this would be consistent with Lally's Option 3 approach outlined in paragraph 820.

886. The key factor in deciding to adopt the first or second method is whether the 10 to 5 year swap costs (shown in red in the second and third bars in Figure 31) are greater or less than the 10 - 5 year term spread (in orange as shown in the first bar in Figure 31). The case where the red swap cost is less than the orange term spread is depicted by the second bar. The case where the red swap cost is greater than the orange term

449 To calculate the 10 year debt risk premium, the '10 year IRS spread to the 10 year CGS risk free rate' may be added to the Authority's estimate of the '10 year spread to swap'. The Authority's 10 year spread to swap estimate is shown in blue in Figure 43 while the 10 year IRS spread to the 10 year CGS risk free rate is shown in purple.

The rationale is that the 10 year spread to swap estimated by the Authority will be less than the 10 year debt risk premium (the latter being based on the 10 year CGS risk free rate). The 10 year IRS Rate is greater than the 10 year risk free by an amount equal to the 10 year IRS spread to the 10 year risk free rate. This is shown diagrammatically on the first bar of Figure 43.

spread is depicted by the third bar. The Authority will apply the first or second method depending on which results in the lowest *expected* cost of debt.

887. Appendix 6 considers the relationship between the two approaches and also provides estimates of the relevant term spread and swaps costs. The Authority understands that the term spread and swap costs vary with time, and that the relativities are not fixed. If the expected term spread is lower than expected swap costs, it is more efficient to incorporate the term spread instead of swap costs. That is, the efficient firm would fix the risk free rate at the ten year rate, rather than swapping ten year floating for five year fixed. This issue was raised by Jemena in their 2013 Rate of Return Guidelines submission to the Australian Energy Regulator.[450]

888. The Authority will review the relative costs of the two approaches prior to the final decision, and select the lowest cost option available at that time. The Authority views this comparison of expected swap costs to the expected term spread as a key step in determining the regulated rate of return. The comparison is consistent with the steps that would be taken in any efficient industry debt management practice.

889. However, the Authority is still working to develop a robust, up to date estimate of the swaps cost approach. Therefore, for the purposes of this draft decision, the Authority has adopted the expected term spread approach.

Estimating the regulated debt risk premium

890. In conclusion, based on the above considerations, the Authority has determined that it will continue using its bond yield approach with two additions: (i) the benchmark sample is extended to recognise the importance of Australian bonds denominated in foreign currencies; and (ii) various curve fitting techniques are adopted to ensure that the estimated cost of debt/debt risk premium is at the target tenor of 10 years.

891. Based on its analysis, the Authority estimates the 10-year 'spread to swap' at 1.80 per cent using the Authority's extended sample bond yield approach (Table 48). This estimate is indicative, and is based on the most recent 7 trading day average ending on 9 September 2014 (the final decision estimate will be based on the 40 day average, for the period agreed with ATCO).

892. For this draft decision, the Authority has converted the estimated 10 year spread to swap, of 1.80 per cent, into a 'regulated debt risk premium' which includes the term spread (as opposed to the swap costs outlined in Figure 31). This is illustrated in the following steps.

893. First, the Authority recognises that the:

10 year Cost of Debt = 10 year Spread to Swap + 10 year IRS rate

894. The estimate of the 10 year AUD IRS rate from Bloomberg is 3.417 per cent (as at 9 September 2014).[451] Therefore, the:

10 year Cost of Debt = 1.798 + 3.417 = 5.215 per cent

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450 Jemena, *Rate of Return Guidelines – Consultation Paper: Submission from Jemena Limited to the Australian Energy Regulator*, June 2013, p. 27.

451 Based on the 7 day average to 9 September 2014, being the indicative averaging period for this draft decision.

895. Second, deducting the estimated 5 year risk free rate of 2.95 per cent (as at 9 September 2014) from the estimated 10 year cost of debt gives the 'regulated debt risk premium' – this debt risk premium reflects the inclusion of the term spread as the 'term spread approach' outlined above:

Regulated Debt Risk Premium = 5.215 – 2.95 = 2.269 per cent

896. The Authority therefore will adopt the estimate of 2.27 per cent as its estimate of the 'regulated debt risk premium'. This debt risk premium will be updated annually, for the reasons set out in the Rate of Return Guidelines.[452]

Annual update of the debt risk premium

897. The Authority determined in the Rate of Return Guidelines that it would annually update the return on debt, to reflect annual updates to the estimate of the debt risk premium. The Authority set out in the Rate of Return Guidelines that it considers that the annual update is an important efficiency consideration, given the inability of firms to hedge this component of the return on debt.[453]

898. ATCO did not accept the annual update approach. ATCO submitted that the annual update of the debt risk premium does not represent an efficient debt management strategy because it introduces:[454]

- additional risks and costs that cannot be managed and would require additional compensation, increasing costs to customers; and
- price volatility for customers.

899. In summary, ATCO submitted that the cost of debt should be determined once at the start of the regulatory period, with the estimate then applied to the entire regulatory period of five years without any annual updating.

900. The Authority notes that both ATCO and network users (Alinta Energy and Kleenheat), in their submissions, have expressed concern at the resulting potential for network tariff volatility arising from annual updates, and a preference for stable tariffs. On this basis, they have expressed support for retaining the current approach of updating the cost of debt once every five years (that is, the debt risk premium would not be annually updated).

901. The Authority engaged Dr Lally to consider the merits of annual updating in comparison with no annual updating of the debt risk premium, in the context of the present value principle (that is, NPV=0) requirements.[455] Lally concludes that:[456]

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452 As noted above, the Authority may estimate the regulated debt risk premium for the final decision through the term spread approach utilised here, or may choose to use the swaps approach, depending on which estimate is lowest at the time.

The Authority seeks to ensure that its regulatory decisions are transparent and replicable. The Bloomberg data used to derive the sample of reference bonds for the final decision will be reported and stakeholders would be able to replicate the estimates as long as they have access to the Bloomberg data.

453 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, p. 78.

454 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 254.

455 M. Lally, *The cost of debt*, 10 October 2014.

456 M. Lally, *The cost of debt*, 10 October 2014, p. 4.

> …both approaches fail to satisfy the NPV = 0 principle, but only trivially providing that the ten-year DRP is used, both would only slightly raise bankruptcy risk, both would give rise to the same average output price, both would involve similar output price volatility, and neither would require a transitional process regardless of which regime were considered to be the current regime. The two points of distinction between the approaches are that annual DRP updating would involve more effort and would send superior signals to firms contemplating capex. The effort involved in annual updating relative to resetting only at the beginning of the cycle would seem to be less important than the superior capex signal. Consequently, annual updating would seem to be superior.

902. The merits of annually updating the debt risk premium were set out in the Rate of Return Guidelines. Those findings are supported by the recent Lally advice. The Authority therefore remains of the view that maintaining signals for the regulated firm with regard to the prevailing debt risk premium – at times where credit defaults swaps are not available – remains important. This ensures that the regulated firm's cost of debt is aligned closely with that faced by other firms in the economy, thereby contributing to efficient financing costs. Efficient financing costs are a prerequisite for overall efficiency, for the achievement of the allowed rate of return objective.[457]

903. The Authority does not accept ATCO's contention that this sets up a requirement for the regulated entity to update the cost of debt every year. As noted in the Rate of Return Guidelines, the cost of debt and the debt risk premium fluctuate for most firms in the economy on a daily basis. The Authority notes that, contrary to ATCO's consultant CEG's arguments, competitive firms do not refinance every day in order to avoid mismatch timing risk associated with daily fluctuating rates.[458] Nor would a regulated firm necessarily choose to refinance yearly in response to the annual update as, like other firms in the economy, it will be seeking to trade off refinancing risk with interest rate risk, among other things. However, the annual update approach will align the cost of debt for the regulated firm more closely with prevailing (fluctuating) rates, and with the finance costs faced by non-regulated firms, thereby reducing a potential economic distortion, improving economic efficiency.[459]

904. The Authority does accept that volatility in tariffs may ensue for customers as a result of the annual updating process, and notes that neither ATCO nor the gas retailers view this as desirable. Accordingly, the Authority has considered how it might retain the property of the annual update – in terms of signalling more closely the prevailing debt risk premium and hence cost of debt – while removing the volatility associated with updating tariffs annually. This would entail a revised approach for setting the debt risk premium, as compared to the approach set out in the Rate of Return Guidelines.

905. The Authority considers that the following revised approach retains the properties of the annual update with regard to efficiency, as it ensures that ATCO faces the prevailing annual debt risk premium. However, the approach would also deliver a single rate of return to apply in each access arrangement, thereby allowing a stable tariff path.

906. First, the debt risk premium for the fourth access arrangement period (**AA4**) would be estimated 'on the day' at the start of the regulatory period. The debt risk premium

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457 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, pp. 73 - 74.

458 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 20, p. 23.

459 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au , December 2013, p. 74.

would be calculated as the 40 day average of the daily rates determined using the Authority's revised bond yield approach, set out above. This actual rate would be published at the commencement of the access arrangement, after the elapse of the 40 days, in line with the Authority's usual practice.

907. Second, the debt risk premium *to apply* for AA4 would be based on the estimated rate determined in the first step, but would be required to fall within the bounds of 100 to 300 basis points, as 'guide rails'. An estimated 'on the day' debt risk premium above 300 basis points would be constrained to 300 for the duration of the access arrangement, and a debt risk premium below 100 would be constrained to 100. This is to ensure that the rate set for the duration of the access arrangement is not influenced by unusually low or high prevailing conditions, such as occurred during the global financial crisis.

908. The resulting debt risk premium would then apply for the whole of the AA4 period.

909. Third, the Authority would publish the annually updated debt risk premium at the start of each of the second to fifth regulatory years of AA4, but not require that this update be reflected in tariffs. The published annual updates would be based on the 40 day average that coincided with the anniversary of the 40 day period used to set the debt risk premium at the start of the access arrangement. Not translating the update to tariffs during the access arrangement period would allow for a stable tariff path.

910. Fourth, at the subsequent regulatory reset for the fifth access arrangement period (**AA5**), the debt risk premium would be set based on the guide rails 'on the day' rate at the start of AA5, similar to AA4. However, the debt risk premium for AA5 will incorporate an adjustment – in present value revenue neutral terms – which will account for the difference between the debt risk premium set at the start of AA4, and the actual annual update outcomes for the debt risk premium that applied in each of the second to fifth years for AA4 (see Appendix 7 for more detail on the properties of this adjustment). In this way, the service provider continues to face during AA4 the cost of debt signal provided by the (published) annually updated debt risk premium, even though the full impact on revenue is not reflected until AA5.

911. The Authority notes that the revised approach set out above would result in the AA4 on the day estimate – determined in the Authority's final decision for AA4 – applying for the duration of AA4. To ensure that the signals with regard to the (reported) annually updated debt risk premia apply for the duration of AA4, the Authority will require ATCO to insert a fixed principle clause in AA4, which will bind the Authority and ATCO to apply the adjustment formula to whatever debt risk premia apply in AA5. This will maintain the benefit of the annual update over the AA4 period, providing efficient signals for new capital expenditure, while allowing for stable tariffs over the period.

Conclusions

912. Based on the above considerations and analyses, the Authority will continue to use its bond yield approach to estimate the debt risk premium for the cost of debt adopted in its regulatory decisions. However, the bond yield approach will be revised by: (i) adjusting the benchmark sample to include Australian bonds denominated in foreign currencies and exclude bonds issued by the financial sector; and (ii) using curve fitting techniques to determine the debt risk premium at the targeted term.

913. The Authority maintains its view set in the Rate of Return Guidelines that the 'NPV=0' present value principle is an important consideration for determining its approach to estimating both the return on equity and the cost of debt.

914. Given the limited depth of credit default markets in Australia, the Authority will estimate the debt risk premium based on a term of 10 years. As a result, the return on debt includes a five-year risk free rate, and a 10-year debt risk premium, both of which remain unchanged for the AA4 regulatory period of five years. The 10 year debt risk premium will be constrained to fall in the range of 100 to 300 basis points.

915. The current indicative estimate of the:

- five year risk free rate is 2.95 per cent;
- the regulated debt risk premium is 2.27 per cent;

916. The (reported) annual update of the debt risk premium will not influence tariffs during AA4, but differences between the annual update of the debt risk premium and the regulatory debt risk premium applying during AA4 will be carried forward to AA5, and used to adjust the estimated debt risk premium applying during AA5.[460] This adjustment will be inserted in the AA4 access arrangement as a fixed principle.

Debt and equity raising costs

917. ATCO proposes to include equity raising costs in revenue modelling for AA4.[461]

918. ATCO proposes to incorporate an allowance of 0.125 per cent being incorporated into the cost of debt, consistent with the Rate of Return Guidelines. ATCO also proposes to incorporate a hedging allowance of 0.025 per cent into the cost of debt estimate. This allowance acknowledges the need to hedge exposure to movements of the risk free rate and is consistent with the Guidelines.[462]

919. As these proposals are consistent with the Rate of Return Guidelines, the Authority accepts these allowances for revenue.

Overall rate of return

920. The indicative nominal vanilla rate of return for the purpose of this Draft Decision is **5.94 per cent**, comprised of:

- gearing of 60 per cent;
- a nominal return on equity of 6.80 per cent;
  - a five year risk free rate of 2.95 per cent;
  - beta of 0.7;
  - a five year forward looking market risk premium of 5.50 per cent
- a nominal cost of debt of 5.36 per cent;
  - a five year risk free rate of 2.95 per cent;

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460 In the unlikely event that the adjustment for AA4 needed to reduce the AA5 guiderails debt risk premium below 100 basis points, then the AA5 guiderails estimate of 100 basis points would be retained for AA5 and the AA4 adjustment and AA5 adjustments (in the event that the current approach was retained for AA5) would be carried forward to AA6 in present value neutral terms. A similar rule would apply for adjustments which would push the adjusted AA5 guiderails estimate to in excess of 300 basis points.

461 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 259.

462 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, p. 256.

- a regulated debt risk premium of 2.27 per cent;
- debt raising costs of 0.15 per cent.

921. The rate of return will apply for the whole of the fourth access arrangement. Annual updates to the estimated regulated debt risk premium will be reported on the Authority's website, but will not affect tariffs for the duration of the fourth access arrangement.

Required Amendment 9.

The Authority requires that ATCO revise its rate of return to be 5.94 per cent.

The Authority requires that ATCO insert a fixed principle in its access arrangement that will bind it to apply an adjustment to the debt risk premium set for the fifth access arrangement period – in present value revenue neutral terms – which will account for the difference between the debt risk premium set at the start of the fourth access arrangement, and the actual annual update outcomes for the debt risk premium that applied in each of the second to fifth years of the fourth access arrangement period.

Gamma

922. The Authority is required by the National Gas Rules (NGR) to estimate the value of gamma, a parameter in the building block revenue model.

923. The gamma parameter accounts for the reduction in the effective corporate taxation that is generated by the distribution of franking credits to investors. As a general rule, investors who are able to utilise franking credits will accept a lower required rate of return, before personal tax, on an investment that has franking credits, compared with an investment that has similar risk and no franking credits, all other things being equal.

Regulatory requirements

924. Rule 87A of the NGR requires that the estimated cost of corporate income tax of a service provider for each regulatory year of an access arrangement period (ETCt) is to be estimated in accordance with the following formula:

$$ETC_t = (ETI_t \times r_t)(1-\gamma)$$

Where

ETC_t is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of reference services if such an entity, rather than the service provider, operated the business of the service provider;

ETI_t is the estimated taxable income for the regulated entity;

r_t is the expected statutory income tax rate for that regulatory year as determined by the AER [Authority]; and

γ is the value of imputation credits.

925. Rule 87A accounts for the ability of imputation credits to reduce the effective corporate tax rate for equity investors.

ATCO's Proposed Revisions

926. In the Rate of Return Guidelines, the Authority estimated gamma (γ) as the product of the distribution rate *F* and the estimate of the utilisation rate *θ*:[463]

$$\gamma = F.\ \theta$$

927. The Rate of Return Guidelines adopted an estimate for the distribution rate, *F*, of 0.7. The distribution rate *F* is a measure of the proportion of imputation credits created by firms that are distributed to investors. The 0.7 rate was based on Australian Taxation

[463] This follows the analysis by Monkhouse in relation to the impact of imputation credits on the effective tax rate of companies. See equation 2.5 in P. Monkhouse, The valuation of projects under the dividend imputation tax system, *Accounting and Finance*, 36, 1996, p. 192.

Office (**ATO**) data showing around 70 per cent of cumulative imputation credits created had been distributed.

928. The Rate of Return Guidelines adopted an estimate for the utilisation rate, θ, as being in the range 0.35 to 0.55.[464] This estimated range was based on the results of dividend drop off studies. The utilisation rate θ in this formulation measures the proportion of those imputation credits distributed which are actually utilised by investors in reducing their personal taxation.

929. Gamma therefore depends on the degree to which imputation credits are distributed, and the degree to which investors utilise those credits that are distributed. The resulting range for gamma adopted for the Rate of Return Guidelines, given by the product of F and the range for θ, was 0.25 to 0.385.

930. ATCO submits that the Authority's estimate of gamma (γ) set out in the Rate of Return Guidelines – for a range of 0.25 to 0.385 – does not produce the best estimate given the requirements of the National Gas Objective and the Revenue and Pricing Principles.

931. ATCO accepts the distribution rate (F) of 0.7 utilised for the Rate of Return Guidelines estimate.

932. However, ATCO submits that the Authority's mid-point estimate of the utilisation rate (θ) – from within an estimated range of 0.35 to 0.55 – is not the best estimate given the available information. ATCO considers that the Authority disproportionately weights its own estimate of θ, at the expense of the SFG studies. ATCO considers that its consultant SFG demonstrates that:

- the ERA's own estimates of θ are below 0.45, and a significant proportion of estimates are below 0.35;
- the ERA study estimating θ presents analysis that does not employ standard market adjustments, such as correcting prices for market movements over the ex-dividend day; and
- the SFG estimates (from 2013) indicate that, if anything, the 0.35 estimate for θ is towards the upper end of the reasonable range.

933. ATCO Gas Australia therefore proposes to base its estimate of θ on the SFG studies. ATCO considers that the approach used by SFG has been subject to a high level of scrutiny from both regulators and the Australian Competition Tribunal.[465]

934. ATCO Gas Australia proposes the value of imputation credits be set at 0.25, on the basis of a distribution rate F of 0.70 and a value for a distributed credit θ of 0.35.

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[464] Monkhouse in his 1993 exposition stated that 'the symbol θ is used throughout to represent a 'utilisation factor'' (P. Monkhouse, The cost of equity under the Australian dividend imputation tax system, *Accounting and Finance*, November 1993, p. 5).

[465] Australian Competition Tribunal, *Application by Energex Limited (Gamma) (No 5)*, 2011.

Submissions

935. Kleenheat Gas submitted that it considered that ATCO's proposed value for gamma is 'too conservative in assessing the value of dividend imputation credits in the Australian environment and therefore supports the Gamma presented in the Guidelines as a more comprehensive measure'.[466]

Considerations of the Authority

936. The Authority has become aware of relevant new information – since the publication of the Authority's Rate of Return Guidelines – regarding the gamma parameter. As a consequence, the Authority considers that the method for estimating the gamma parameter warrants re-examination.

937. First, the Australian Energy Regulator (**AER**) commissioned an expert report by Lally which explores the theoretical underpinnings of the gamma and assesses the appropriateness of various methodologies for estimating gamma.[467] Second, the Queensland Competition Authority (**QCA**) also commissioned work by Lally on the estimation of gamma. The Authority considers these reports add to the regulatory debate regarding the impact of imputation credits.

938. The Authority therefore has re-visited its estimate of the gamma parameter for the purposes of this draft decision. In that process, the Authority has taken into account:

- considerations relating to theoretical framework for estimating gamma;
- the Authority's prior position, set out in the Rate of Return Guidelines, which accounted for stakeholder input and a range of consultants' reports;
- ATCO's submission on gamma;
- Lally's November 2013 report to the AER;
- Lally's November 2013 report to the QCA, and his responses to submissions to the QCA on that report;
- the conclusions of the AER in responding to Lally's report, set out in its rate of return guidelines;[468]
- the conclusions of the Queensland Competition Authority (**QCA**) in its recent cost of capital determination, which also considered the foregoing material, as well as additional material with regard to the estimation of gamma.[469]

Draft decision

939. The following summarises the Authority's considerations in revising its estimate for gamma for the purpose of this draft decision – more detail may be found in Appendix 8.

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466 Kleenheat Gas, *Kleenheat Gas submission on the Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement*, 21 May 2014, p. 2.

467 M. Lally, *The Estimation of Gamma,* Report for the AER, 23 November 2013.

468 Australian Energy Regulation, *Explanatory Statement – Rate of Return Guideline*, December 2013.

469 Queensland Competition Authority, *Final decision: cost of capital: market parameters*, August 2014.

Definition of the domestic capital market

940. In reconsidering its estimate of gamma, the Authority has taken account of the definition of the capital market used for determining the allowed rate of return, which was set out in the Rate of Return Guidelines. In particular, the Authority has adopted a domestic CAPM, while allowing for the presence of foreign investors:[470]

> In summary, the Authority's position is that the boundary should account for the full domestic data set, including any direct influences on the cost of capital for Australian domiciled firms. This may include the influence of international investors in Australian markets for equity, or the influence of international lenders supplying debt finance directly to Australian firms.

941. Therefore, to maintain internal consistency, the Authority considers that the estimate of gamma needs to take into account the presence of international investors in the Australian domestic capital market.

Interpretation of gamma

942. The equation set out in paragraph 926 interprets the value of franking credits in the context of the Officer CAPM framework.[471] The benefit arising from imputation credits can be interpreted as the proportion of franking credits received that are then redeemed by the representative investor. Within the context of the Officer model, this 'value' is not a market value, but instead a 'numerical value' arising out of the degree to which imputation credits are utilised.[472]

943. The utilisation rate is a market-level parameter, meaning that the same value applies to all firms.[473] Individual investors have differing utilisation rates; investors who are able to fully use tax credits are assigned a value of one whilst investors who cannot are assigned a value of zero. These individual utilisation rates may be weighted to produce the required market-level utilisation rate θ. Therefore θ 'is a complex weighted average over all investors holding risky assets, where the weights involve each investor's investment in risky assets and their risk aversion'.[474,475]

Distribution rate

944. The Rate of Return Guidelines adopted an estimate for the distribution rate, F, of 0.7. The estimate has been widely accepted in recent times; the Australian Competition Tribunal (**ACT**) for example concluded that a distribution ratio of 0.7 was supported by

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470 Economic Regulation Authority, Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, www.erawa.com.au, December 2013, p. 30.

471 R.R. Officer, The Cost of Capital of a Company under an Imputation Tax System, *Accounting and Finance*, May 1994.

472 M.Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 12.

473 M.Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 11.

474 Ibid.

475 M. Lally. and T. van Zijl, 'Capital Gains Tax and the Capital Asset Pricing Model', *Accounting and Finance,* vol.43, 2003, pp. 187-210.

a range of evidence and submissions.[476] The ACT concluded 'there is no empirical data that is capable of supporting an estimated distribution ratio higher than 0.7'.[477]

945. However, Lally has developed an alternative estimate of the distribution rate *F* based on the financial reports of the top 20 ASX200 firms, of 0.84.[478] The Authority agrees with the QCA that this provides a robust estimate of the distribution rate, albeit for listed firms.

946. This robustness contrasts with the estimates based on the ATO data, which are not entirely consistent, and which may have potential biases due to reporting omissions. The cumulative distribution rate drawn from tax statistics is 0.7.[479] In addition, a five year average of recent annual estimates constructed from net tax and the change in the franking account balance is 0.7. However, a five year average of recent annual estimates constructed from net tax and franked dividends distributed is 0.53.[480]

947. Nonetheless, the Authority considers it reasonable to conclude that the ATO data supports an estimate for the distribution rate across *all* equity of around 0.7.

948. It is desirable to have an estimate of gamma that is internally consistent. The Authority notes that its preferred measures of the utilisation rate (refer below), are based on estimates derived using all listed and unlisted equity. As noted, the ATO data covers both *listed* and *unlisted* firms.

949. Therefore, the Authority will adopt a distribution rate of 0.7, consistent with the broad definition of all equity.

Utilisation rate

950. The Rate of Return Guidelines utilised estimates from dividend drop off studies for the purpose of estimating θ. The dividend drop off studies used to inform the estimated range were developed by SFG Consulting (estimate of 0.35 for θ), and by the Authority itself (range of 0.35 to 0.55 for θ).

951. The Authority considers that ATCO's criticisms with regard to the Authority's selection of the range for θ for the Rate of Return Guidelines are not well founded. First, the Authority considers that there is a strong rationale to avoid market correction, as this fluctuation is already in the error term.[481] Second, the Authority considers that its study provides for a comprehensive range of estimates, which are based on a range of robust

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476 Australian Competition Tribunal, *Application by Energex Limited (Distribution Ratio (Gamma)) (No 2) [2010] ACompT7*, October 2010, para 57; Australian Competition Tribunal, *Application by Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] ACompT9*, October 2010.

477 Australian Competition Tribunal, *Application by Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] ACompT9*, October 2010.

478 M. Lally, *Estimating Gamma*, Report for the QCA, 25 November 2013.

479 The tax statistics estimates were updated by NERA in 2013 and submitted by the Energy Networks Association as part of the Rate of Return Guidelines process (see NERA, *The Payout Ratio*, June 2013).

480 Ibid.

481 As noted by McKenzie and Partington, such an approach is likely to introduce bias, as it may mask the true price outcomes (see M. D. McKenzie and G. Partington, Selectivity and Sample Bias in Dividend Drop-Off Studies, Finance and Corporate Governance Conference 2011 Paper, 28 November 2010). The Authority considered this issue in detail in the Rate of Return Guidelines (see Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 220).

econometric approaches and tests. The Authority considers that its judgment for θ to lie in a range of 0.35 to 0.55 was reasonable – given the results that are considered robust – although the underlying range, of 0.32 to 0.53, could have suggested a range of 0.3 to 0.5 if rounded down.[482] Third, the Authority notes that SFG Consulting's estimates fall within the estimated range, despite the Authority's concerns with the treatment of outliers applied in that study.[483]

952. Dividend drop off studies use econometric regression to determine the drivers for the change in the share price when a stock goes ex–dividend. The regression explains the resulting price change in terms of the value of the dividend itself, and the value of the franking credit. The inference in the Rate of Return Guidelines was that the regression coefficient on the franking credits from dividend drop off studies provides a direct estimate of θ – as being the proportion of franked dividends that are utilised by investors for the purpose of redeeming imputation credits.

953. However, Lally has identified that the regression coefficient on franking credits estimated in dividend drop off studies may not necessarily equate to the utilisation rate θ, given that the tax rate on gross dividends diverges from capital gains. Rather, Lally argues that the regression coefficient on franking credits may be constituted as a product of the utilisation rate θ and the regression coefficient on the value of the dividend in determining the resulting share price drop off.[484]

954. If follows then, that in order to derive the required utilisation rate, θ, from dividend drop off studies, the estimated coefficient of the franking credit must be divided by the estimated coefficient of the cash dividend.

955. Adjusting the estimates utilised for the Rate of Return Guidelines in this way, dividing the estimated regression coefficient on the franking credit by the estimated regression coefficient of the cash dividend, results in an estimate of θ of 0.4 from the SFG analysis,[485] and a range of 0.38 – 0.69 from the robust results of the Authority's own analysis.[486]

956. SFG has noted that other factors may also be captured in the regression coefficient on franking credits from dividend drop off studies, casting further doubt on their application for the purpose of estimating θ.[487]

957. However, the Authority considers that applying the Lally adjustment may bring the estimate of θ derived from dividend drop off studies closer to its true value. Given the uncertainty associated with the adjustment, the Authority has only extended the

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482 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 220.

483 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 220.

484 Note that Lally refers to θ by the equivalent symbol U (see M. Lally, *Estimating Gamma*, Report for the QCA, 25 November 2013, p. 21).

485 SFG Consulting, *Dividend drop-off estimate of theta*, Final Report, 21 March 2011.

486 The upper bound of 0.69 is the division of the upper bound utilisation estimate of 0.53 by the coefficient on the cash dividend of 0.77 (see Table 5 in D. Vo, B. Gellard, S. Mero. 'Estimating the Market Value of Franking Credits, Empirical Evidence from Australia' Conference Paper, Australian Conference of Economists 2013).

487 SFG Consulting, *An appropriate regulatory estimate of gamma*, Report for Aurizon Ltd, 16 January 2014.

estimated range for θ from dividend drop off studies at the upper bound, to a rounded 0.7, to account for the upper bound estimate of 0.69. The Authority has also rounded the lower bound estimate down to 0.3 to account for the uncertainty in the estimates, and to respond to ATCO's concerns. The Authority's resulting range for θ derived from dividend drop off studies is 0.3 to 0.7.

958. The Authority notes that dividend drop off studies provide for a market based measure. The Authority agrees with Lally that there are other reasons why estimates developed through dividend drop off studies may not correctly estimate the required utilisation rate required under the Officer framework, as, among other things:[488]

- The required utilisation rate under the Officer framework is a complex weighted average determined by the value of equity that investor's hold and their relative risk aversion. Dividend drop off studies, however, only estimate the value weighted utilisation rate around just two days, the cum-dividend and ex-dividend dates. As a consequence, they provide an estimate of the utilisation rate with a value weighting that reflects the composition of investors around the cum and ex-dividend dates, not the weighted average across the entire market over an entire year, as required.[489]
- There are significant econometric challenges in estimating θ from dividend drop of studies. Trading around the ex-dividend date reflects a variety of different incentives and price movements. Dividend drop off studies may not accurately separate out the effect of the taxation incentive associated with imputation credits on the share price change.

959. For these reasons, the Authority has determined to place limited weight on the dividend drop off estimates, and on the range of applied market value estimates more generally.

960. The Authority has instead considered other approaches to estimating θ (for more detail, see Appendix 8).

961. In summary, the Authority considers that two estimation methods for determining the utilisation rate – the 'equity ownership' approach and the 'taxation statistics' approach – warrant primary consideration for the purposes of this draft decision. In addition, the Authority also gives weight to the so-called 'conceptual goal posts' approach. Each of these approaches is described in what follows.

962. First, the Authority notes that the equity ownership approach, can provide for an estimate of the utilisation rate that is consistent with Officer CAPM. This is because the majority of domestic investors will be eligible to redeem imputation credits (and therefore have an implied utilisation rate of 1), while foreign investors will not be eligible (with an implied utilisation rate of 0). The proportion of domestic ownership of capital

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488 M. Lally, *The Estimation of Gamma,* Report for the AER, 23 November 2013, p. 20.

489 The AER have observed that problems with dividend drop off studies include (Australian Energy Regulator, *Explanatory Statement – Rate of Return Guideline*, December 2013, p. 167):

- the problems of 'allocating' the effect of share price changes ex-dividend to a range of potential drivers, including the dividend, the franking credit, income taxes, capital gains taxes, discounting for the effect of time, and potentially some transactions costs, as well as other econometric challenges and issues;
- the price change not reflecting accurately the impact of the share going ex-dividend, due to market movements in the share price swamping the effect of the dividend and franking credit, bid-ask bounce effects (if the dividend is small relative to the spread between bid and asking prices) thin trading effects, or delays in relevant price movements being fully expressed in share prices.

investments therefore provides a simple and transparent estimate of the utilisation rate.

963. The Authority notes that resulting estimate does not account for the required risk weighting of utilisation rates. However, the Authority is not aware of any means to incorporate such a consideration.[490] Therefore, the Authority accepts that current estimates of domestic investors' equity ownership share – which suggest a proportion of around 0.56 for listed equity, and continue to support an estimate of 0.7 for listed and unlisted equity – provide relevant information for determining the value of θ.[491]

964. The Authority's preference is to adopt an estimate based on the equity ownership of *listed and unlisted* equities, consistent with the approach adopted to estimate the distribution rate set out above. The Authority considered switching its estimation approach to be based on listed equity ownership only, as this underpins other parameter estimates for the rate of return. However, the resulting estimate of the utilisation rate, of 0.56, would fall outside the bounds for the utilisation rate, of 0.6 to 1 inferred from the conceptual goal posts approach (see below), and is therefore rejected.[492]

965. Second, the Authority agrees with the AER that taxation statistics – which report the proportion of imputation credits redeemed by domestic investors – suggest a utilisation rate of 0.4 to 0.8. However, the Authority only gives low weight to this estimate, as there are relevant concerns with regard to the data quality and consistency. Hathaway, for example, has cautioned against use of this data, given the observed large discrepancies in relation to franking credits when comparing ATO taxation data to ATO company financial data. Accordingly, the Authority does not consider that the taxation statistics methodology can be given much weight in determining the required utilisation rate, θ.

966. Third, the Authority considers that the 'conceptual goal posts' approach provides an indicative guide for the determination of θ, given the presence of foreign investors in the domestic market. This approach recognises that the estimate of the rate of return required by investors in the domestic market (which allows for imputation) should lie between the bounds of an estimate related to a completely segmented domestic financial market (with a corresponding θ of close to 1) and a domestic market fully integrated with global market (with a corresponding θ of close to 0).

967. On this basis, the Authority notes – based primarily on the estimates of Lally – that θ should conceptually lie within the range of 0.6 to 1 (see Appendix 8).[493]

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490 Lally observes that ignoring risk weighting may be reasonable if it is assumed that individual investors' risk aversion is uncorrelated with their utilisation rate (see M. Lally, *The Estimation of Gamma*, Report for the AER, 23 November 2013, p. 11).

491 Queensland Competition Authority, *Final Decision: cost of capital: market parameters*, August 2014, p. 98. The Authority notes that Hathaway has recently examined this data, finding figures closer to 0.8. However, as noted by the AER: 'Given they are the primary authors of this data, the ABS reported figures might be considered more reliable.' (Australian Energy Regulator, *Explanatory Statement – Rate of Return Guideline*, December 2013, p. 172).

492 That said, the Authority notes that the corresponding distribution rate for listed equities – as estimated by Lally – is 0.84. Together, the two (internally consistent) parameters indicate a value of gamma of 0.5 when rounded, which is identical to the estimate of gamma for this draft decision.

493 In determining this range, the Authority has taken account of differences in the rate of return parameters utilised by Lally in his analysis and those adopted for this draft decision. The Authority has noted SFG

968. The Authority therefore has considered a range of estimates for θ, based on:

- dividend drop off studies – which suggest an estimate of θ in the range of 0.3 to 0.7 – this is given low weight;
- equity ownership – which suggests an estimate of θ of 0.7, based on the ownership of listed and unlisted equities – this estimate is given most weight;
- taxation statistics – which suggest θ is in the range of 0.4 to 0.8 – these estimates are given low weight; and
- the conceptual goal posts – which suggest θ is in the range of 0.6 to 1 – these estimates are given some weight.

969. The Authority has exercised its judgment across the resulting, somewhat divergent, set of estimates. The Authority considers that an estimate of 0.7 provides a most likely estimate of the utilisation rate that takes account of the various ranges, and the Authority's weighting of their robustness.

Estimate of gamma

970. The Authority has for the purposes of this draft decision, determined that a gamma parameter of 0.5 is appropriate. This estimate is based on the product of a payout ratio of 0.7, and a utilisation rate of 0.7. The resulting estimate of 0.49 is rounded to 0.5, in acknowledgement that the estimate is based on a fairly wide range, and subject to imprecision.

Required Amendment 10.

ATCO is required to adopt a gamma of 0.5.

Consulting's contention that the Lally estimates are flawed due to the assumption of the same risk free rate in a fully segmented and fully integrated market (SFG Consulting, *An appropriate regulatory estimate of gamma*, Report for Aurizon Ltd, 16 January 2014, p. 23). The Authority has also accounted for Lally's view that the CAPM assumes an exogenous risk free asset (M. Lally, *Review of Submissions to the QCA on the MRP, Risk-free Rate and Gamma*, 12 March 2014, p. 31). The Authority considers that there is some merit in SFG's view that the risk free rate might differ between a fully segmented and a fully integrated capital market. However, the extent and direction of the difference is not clear, as it will depend on the relative supply and demand for risk free assets in each case. Given this, it is possible that the risk free rate could either increase or decrease the lower bound for the estimate of θ under the conceptual goal posts approach. For that reason, the Authority only gives some weight to this estimate, and notes its potential limitations.

Depreciation

Regulatory Requirements

971. Rule 88(1) of the NGR provides that the 'depreciation schedule sets out the basis on which the pipeline assets constituting the capital base are to be depreciated for the purpose of determining a reference tariff'. Rule 88(2) of the NGR provides that the 'depreciation schedule may consist of a number of separate schedules, each relating to a particular asset or class of assets'.

972. Rules 89 and 90 of the NGR specify particular depreciation criteria and requirements for the calculation of depreciation for establishing the opening capital base for the subsequent access arrangement.

973. Rule 89 criteria are as follows:

> 89. Depreciation criteria
>
> 1) The depreciation schedule should be designed:
>
> (a) so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services; and
>
> (b) so that each asset or group of assets is depreciated over the economic life of that asset or group of assets; and
>
> (c) so as to allow, as far as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset, or a particular group of assets; and
>
> (d) so that (subject to the rules about capital redundancy), an asset is depreciated only once (ie that the amount by which the asset is depreciated over its economic life does not exceed the value of the asset at the time of its inclusion in the capital base (adjusted, if the accounting method approved by the [ERA] permits, for inflation)); and
>
> (e) so as to allow for the service provider's reasonable needs for cash flow to meet financing, non-capital and other costs.
>
> 2) Compliance with subrule (1)(a) may involve deferral of a substantial proportion of the depreciation, particularly where:
>
> - (a) the present market for pipeline services is relatively immature; and
> - (b) the reference tariffs have been calculated on the assumption of significant market growth; and
> - (c) the pipeline has been designed and constructed so as to accommodate future growth in demand.
>
> 3) The [Authority's] discretion under this rule is limited.

974. The Authority's discretion is limited under rule 89. Rule 40(2) of the NGR sets out the Authority's limited discretion powers. Rule 40(2) states that the regulator must not withhold its approval of an element of an access arrangement proposal if it is satisfied that the element complies with the applicable requirements of the NGL and is consistent with applicable criteria (if any) prescribed by the NGL.

975. Rule 40(2) of the NGR provides the following example:

> The [ERA] has limited discretion under rule 89. (See rule 89(3).) This rule governs the design of a depreciation schedule. In dealing with a full access arrangement submitted for its approval, the [ERA] cannot, in its draft decision, insist on change to an aspect of a

> depreciation schedule governed by rule 89 unless the [ERA] considers change necessary to correct non-compliance with a provision of the Law or an inconsistency between the schedule and the applicable criteria. Even though the [ERA] might consider change desirable to achieve more complete conformity between the schedule and the principles and objectives of the Law, it would not be entitled to give effect to that view in the decision making process.

976. Rule 90 of the NGR specifies that a full access arrangement must contain provisions governing the calculation of depreciation for establishing the opening capital base for the next access arrangement period. The provisions must resolve whether depreciation of the capital base is to be based on forecast or actual capital expenditure.

ATCO's Proposed Changes

977. ATCO is proposing to apply straight line depreciation in nominal terms to the historic cost of the asset (the Historic Cost Accounting method or **HCA** approach). HCA is based on the values of the assets at the time of expenditure. Under HCA, the historic cost values are not indexed year to year for inflation. Annual depreciation is calculated by dividing the historic (book) value of the asset by its effective life. The resulting value in nominal terms for each year is then included as the depreciation building block in the cost of service.

978. This approach contrasts with a Current Cost Accounting (**CCA**) approach, which has been used for the GDS access arrangements to date. The CCA approach indexes the written down value of the previous year's asset base, each year, to account for inflation, thereby maintaining the written down historic value in real terms (giving the so-called 'current cost'). Annual depreciation is then calculated on the current cost, given the effective life of the asset.

979. The resulting depreciation building block value differs slightly depending on whether it is used in a real or nominal revenue model. Assuming a straight line depreciation method is adopted, then:

- In a real revenue model – as was used by the Authority for the previous access arrangement – the CCA straight line depreciation amount is used directly as the depreciation building block in the cost of service.
- In a nominal revenue model – such as the Post Tax Revenue Model (**PTRM**) used by the AER – the annual inflation gain in the regulated asset base, calculated by multiplying the previous year's closing asset value by the rate of inflation, is deducted from the nominal depreciation for the current year.[494] This removes a double count for inflation, which would otherwise occur in the PTRM.[495]

980. ATCO's revised access arrangement uses a nominal building block model. ATCO is proposing to estimate depreciation using the HCA method, stating:[496]

> A further rule now relevant to the calculation of depreciation is rule 87(4), which requires the rate of return to be determined on a nominal vanilla basis. To date ATCO Gas Australia's rate of return has been determined on a real basis and applied to an indexed

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494 In the PTRM, the nominal depreciation for the current year is calculated as the value of the depreciation on the indexed (opening) capital base.

495 This is because the nominal WACC also includes a return for inflation. In the PTRM, the WACC is also applied to the opening value of the capital base in the current year. Therefore, a return for inflation is included in both the WACC and in the unadjusted depreciation. Deducting the value of inflation applied through indexation under the CCA depreciation approach therefore avoids a double count.

496 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 210.

> capital base, to which a depreciation allowance calculated on a straight line basis is applied. New rule 87(4) requires a change in approach to avoid double counting inflation, which would otherwise occur if a nominal return was applied to an indexed capital base.
>
> ATCO Gas Australia considers the optimal application of the new rate of return framework within the context of the NGR is to only account for inflation in the rate of return and not to apply inflation to the capital base. This approach relies on the value of the capital base being recorded using the historical cost accounting method (HCA). The previous practice of applying inflation reflected a current cost accounting method (CCA).
>
> The NGR does not require the application of inflation to the capital base. Indeed, the process for determining the opening and projected capital base under the NGR does not provide for the application of inflation. The potential for the application of inflation to the capital base is acknowledged in rule 89(1)(d). This rule contemplates, but does not require, that the application of inflation to the capital base can occur where the accounting method approved by the regulator permits.

981. ATCO considers that two primary approaches could be used to calculate depreciation, the HCA and CCA methods:

> …the HCA method is simpler and better understood than CCA and is more widely used in competitive markets. The HCA approach also eliminates the need for a deduction for the double counting of inflation, which under the CCA method is an additional step that addresses a problem that does not need to be introduced.
>
> Both methods comply with rule 89(1)(b). ATCO considers the HCA method better complies with rule 89 (1)(a) and removes the need to consider rule 89(2) as deferral of depreciation is not required.
>
> Although the HCA approach results in a short term price impact, this is offset by lower prices in the longer term. If HCA is applied, the higher prices in the short term would result in ATCO Gas Australia receiving more revenue in the AA4 period than under a CCA approach. However, ATCO Gas Australia receives no more revenue in net present terms over the life of the capital base under either approach.

982. ATCO considers the HCA method is consistent with the National Gas Objective, the Revenue and Pricing Principles and rule 87(4) and 89 of the NGR. The main reasons put forward in this context are:

- it is more economically efficient than CCA; and
- it promotes efficient market growth.

983. ATCO states that there is no economic literature to support the notion of CCA. ATCO submits that the accounting method and depreciation are tools to allocate the recovery of the sunk cost of pipeline investment. The challenge is to ensure that the allocation of the recovery of these costs over time does not distort efficient investment, consumption and use. With regard to efficiency, ATCO states:[497]

> Ensuring today's customers make consumption choices based on today's costs is more efficient than customers in the future making choices about consumption on the basis of prices that include costs deferred from past periods. Prices and pricing design are the first and best solution to achieve efficient consumption and use of services.
>
> The deferred recovery of depreciation could exacerbate the impact on prices where technology and appliance efficiency leads to lower demand. This would result in future customers paying a higher share of past investment costs. Customers who are captive to gas in the medium and long term (due to having made long term investments in gas appliances) will not be in a position to do anything about this potential upwards spiral.

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[497] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 215-216.

> …To the extent that the recovery of investment costs must be allocated, the goal is minimising the distortions in the price path when compared to the long run marginal cost.

984. With regard to promoting efficient market growth, ATCO engaged NERA to consider which depreciation schedule allows reference tariffs to vary over time in a way that promotes efficient growth in the market for reference services. The NERA analysis suggests that the long run marginal cost (**LRMC**) of energy network services will decline over time, and that a HCA depreciation schedule for ATCO better minimises any resulting gap to LRMC, as compared to CCA, and is therefore more consistent with the requirements of the NGR.

985. In particular, NERA's analysis suggests that ATCO's revenue per unit will increase through time under each of the three depreciation scenarios and concludes the following:

- the use of a straight line depreciation approach together with an unindexed capital base would result in time profile of tariffs that best promotes efficient growth in the market for reference services;
- ACTO's proposed transition method would better promote growth in the market for reference services, as compared with an indexed straight line depreciation approach together with an indexed capital base; and
- the indexed straight line depreciation approach together with an indexed capital base least promotes efficient growth in the market for gas distribution services.

986. On the basis of NERA's analysis, ATCO proposes HCA as a preferred approach. ATCO notes that a change in approach from CCA to HCA could lead to a short term price increase to customers. For that reason, ATCO proposes that the change to the methodology occurs over more than one access arrangement period.

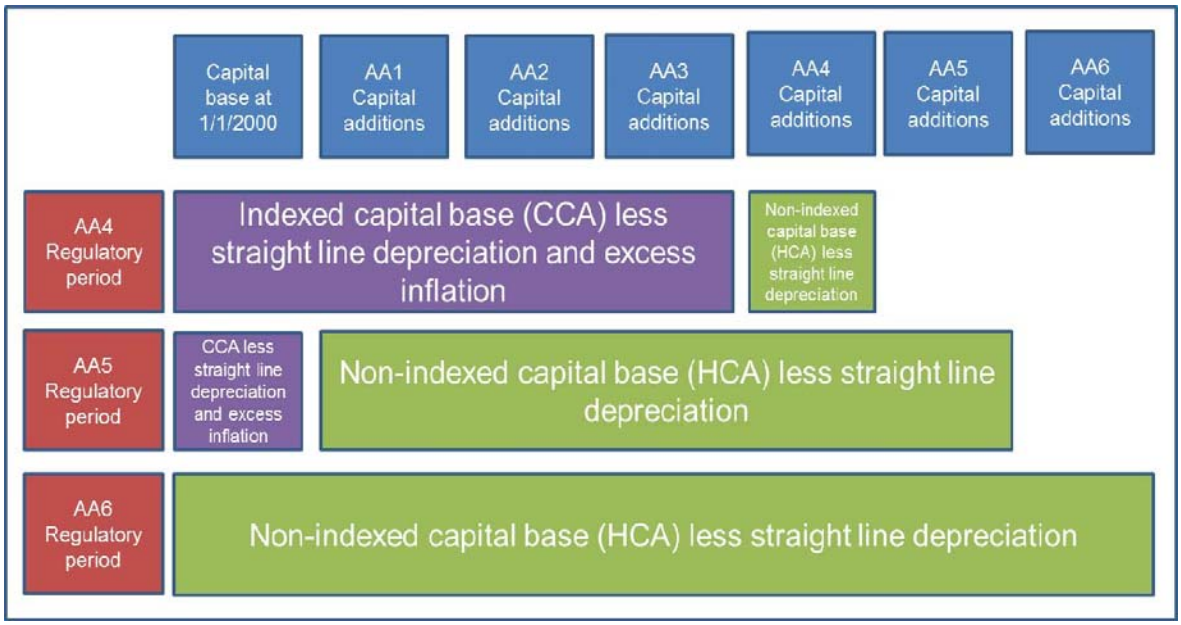
987. ATCO proposes a transition to the new method by first applying HCA to all capital additions that occur from 1 July 2014, and then progressively applying HCA to the past capital base over the next two regulatory periods:

- The depreciation schedule for the AA4 period will be determined by applying:
  - straight-line depreciation to the HCA value of all capital additions to occur during AA4 (from 1 July 2014); and
  - straight line depreciation to the CCA value of the opening capital base in any year of the period and subtracting an amount to remove the double counting of inflation.
- In the next access arrangement period, the depreciation schedule will be determined by applying straight line depreciation to:
  - the value of all capital additions that occurred between 1 January 2000 and 30 June 2014, indexed to 1 January 2020 but not thereafter;
  - the CCA value of the opening capital base at 1 January 2000 and subtracting an amount to remove the double counting of inflation; and
  - the HCA value of all capital additions that occurred in AA4 and to occur during the next period.
- In all subsequent regulatory periods following the next regulatory period, the depreciation schedule will be determined by applying straight line depreciation to:
  - the value of all capital additions that occurred between 1 January 2000 and 30 June 2014, indexed to 1 January 2020 but not thereafter;

- the CCA value in any year of the period of the opening capital base at 1 January 2000, indexed to 1 January 2025 but not thereafter; and
- the HCA value of all capital additions that occurred in AA4 and following periods and to occur during subsequent periods.

988. Figure 32 summarises the proposed treatment of capital in subsequent regulatory periods.

Figure 32 ATCO's Proposed Approach to Determining the Projected Capital Base.



Source: ATCO Gas Australia, *Access Arrangement Information, 17* March 2014, p. 220.

989. ATCO's analysis concludes that transitional depreciation would better promote growth in the market for reference services, as compared with an indexed and unindexed approach.

990. ATCO proposes a fixed principle to give effect to the transition. ATCO's proposed fixed principle is discussed in the fixed principles section.

991. Table 49 shows ATCO's proposed calculation method and transitional depreciation amount for the fourth access arrangement period.

Table 49 ATCO's Forecast depreciation calculation: 2014 to 2019

Nominal $ million	July to Dec 2014	2015	2016	2017	2018	2019	Total
Forecast depreciation on opening capital base 1 July 2014 (straight line depreciation on CCA capital base less double counting of inflation)	4.83	12.83	13.46	13.56	13.32	12.20	70.19
Forecast depreciation on forecast capital expenditure (straight line depreciation on HCA capital)		2.69	7.00	11.31	15.59	20.54	57.13
Total	**4.83**	**15.52**	**20.45**	**24.86**	**28.91**	**32.74**	**127.33**

Source: ATCO Tariff Model, September 2014.

992. Table 50 shows ATCO's proposed calculations for the projected capital base at 31 December 2019.

Table 50 ATCO's Proposed Projected Capital Base: 2014 to 2019

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019
Closing capital base	1,048.07	1,112.01	1,178.29	1,241.37	1,299.24	1,354.84

Source: ATCO Tariff Model, September 2014.

993. Rule 89(c) of the NGR provides that the depreciation schedule should be designed to allow, as far as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset, or a particular group of assets.

994. ATCO proposes to reduce the economic asset lives of its high pressure steel and plastic pipelines from 120 years to 80 years and 60 years respectively, for depreciation purposes.

995. ATCO states that the economic lives of its high pressure mains are affected by changing standards in asset management and safety requirements and are significantly out of step with other gas distribution businesses in Australia.

996. ATCO has added a new asset class for vehicles or fleet. Vehicles were previously accounted for under the asset class equipment and vehicles. The economic asset life for vehicles was 10 years in the third access arrangement period. ATCO has reduced the economic life for vehicles to 5 years in the fourth access arrangement period. ATCO has not identified this change in its access arrangement information and incorrectly states that the asset life for vehicles in the third access arrangement was 5 years.[498]

997. Table 51 shows ATCO's proposed asset lives used to calculate depreciation in the fourth access arrangement period compared to the asset lives for the third access arrangement period.

[498] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 78, p. 222.

Table 51 ATCO's Proposed Asset Lives used to Calculate Depreciation (Years)

Asset class	Life used to calculate depreciation AA3	Life used to calculate depreciation AA4
High Pressure mains - steel	120	80
High Pressure mains - PE	120	60
Medium pressure mains	60	60
Medium/low pressure mains	60	60
Low pressure mains	60	60
Regulators	40	40
Secondary gate stations	40	40
Buildings	40	40
Meters and service pipes	25	25
Equipment and vehicles	10	10
Vehicles	5[499]	5
Information technology	5	5
Full retail contestability	5	5

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 78 p. 222.

Submissions

998. Kleenheat Gas expressed concern with the short to medium term impact of the proposed transition from CCA to HCA. Kleenheat Gas states that higher tariffs in the short term will create a barrier to entry for some customers connecting to natural gas and that this is counterintuitive to promoting efficient growth in the natural gas market.

Considerations of the Authority

999. The Authority notes that it has limited discretion under rule 89 of the NGR. Under rule 89 of the NGR, the Authority can reject ATCO's proposed depreciation approach if:

- it is not consistent with the applicable criteria listed under rule 89(1) of the NGR which includes ensuring that the depreciation schedule should be designed to:
  - promote efficient growth in the market for reference services; and
  - depreciate assets over their economic lives (see paragraph 973 for other applicable criteria); or
- it does not comply with the applicable requirements of the NGL.

1000. ATCO is proposing to apply straight line depreciation in nominal terms to the historic cost of the asset (using the HCA approach). The Authority evaluates ATCO's proposal in terms of the requirements of the NGR and NGL in what follows.

[499] Vehicles were previously accounted for under the asset class equipment and vehicles. The economic asset life for equipment and vehicles in the third access arrangement period was ten years.

1001. Australian regulators generally adopt real straight line depreciation of the regulatory asset base. This 'standard' regulatory approach can be considered to be in the long term interests of consumers because it results in a more even allocation of the return on and of capital in real terms over time, thereby:

- achieving efficient growth in the market for reference services over time in line with the requirements of rule 89(1)(a) of the NGR;
- providing efficient signals for utilisation of assets over the whole of their economic life, thereby contributing to the achievement of the National Gas Objective and the Revenue and Pricing Principles;[500]
- taking account of the interests of current and future consumers over the economic life of the assets; and
- avoiding price shocks for consumers when major assets reach the end of their effective life and are replaced.

1002. Real straight line depreciation may be converted to nominal terms, as is done in the AER's Post Tax Revenue Model (**PTRM**). This is achieved by indexing the capital base and determining the associated straight line depreciation for each asset, and then removing an amount so as to avoid a double count for inflation that would otherwise occur when a nominal rate of return is applied to an indexed asset base.[501] The PTRM approach is a CCA approach.

NGR 89(1)(a) – promotion of efficient growth in the market

The Australian Competition Tribunal decision

1003. The Authority notes that the AER rejected APA GasNet's proposal to change from a CCA approach to a HCA approach in 2013. In its draft decision, the AER considered APA GasNet's proposal to use the HCA approach did not meet the requirements of rule 89(1)(a) of the NGR, regarding the promotion of efficient growth of the market for reference services on the grounds that it leads to:[502]

- Inefficient asset utilisation – HCA depreciation schedules provide for price paths that encourage inefficient utilisation of assets, that is, under or over utilisation of the asset at different times in its life cycle.
- HCA can result in unnecessary high prices in the short to medium term – these could discourage gas usage and downstream investment.
- HCA can lead to inefficient management of assets – leading to incentives to manage assets based on reasons other than the efficient provision of reference services.

1004. The AER concluded in its final decision that:[503]

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500 The efficient use of assets relate to the network assets themselves, as well as the assets of the upstream and downstream users of the network services.

501 For a summary of the need to remove double counting for inflation when a nominal rate of return is applied to a nominal asset base, see section 2.2 in Queensland Competition Authority, *Financial Capital Maintenance and Price Smoothing*, February 2014.

502 Australian Energy Regulator 2012, *Access arrangement draft decision: APA GasNet 2013-17: Part 2*, p. 176.

503 Australian Energy Regulator 2013, *Access arrangement final decision: APA GasNet 2013-17: Part 1*, p. 36.

> ...the standard [CCA] depreciation approach will generally lead to tariffs varying, over time, in a way that promotes efficient growth in the market for reference services. In most circumstances an efficient outcome would be that sunk costs are recovered as evenly as possible over an asset's life and that revenues (and tariffs) are relatively flat. As the scale of operations change, the revenue (and tariff) path should shift up/down to reflect the new scale of operations. The standard depreciation approach achieves such an efficient outcome.

1005. Following a review of the AER's decision, the Australian Competition Tribunal (**ACT**) found that no reviewable error had been made by the AER in respect of the decision to reject the HCA approach. In particular, the ACT was satisfied that the AER was correct when it concluded that:[504]

> …the correct economic approach was to consider the tariff path in real dollar terms. … Then, in respect of the tariff path that results from the AER's approved depreciation methodology, the AER says that it is not correct that there is no evidence that long-run marginal cost has fallen to a large extent. The reduction in tariffs in 2013 was caused by reductions in APA GasNet's costs (as assessed within the building block methodology). The evidence shows that the cost of capital had declined and the value of APA GasNet's capital base had declined from the previous access arrangement period because its actual capital expenditure was substantially less than had been forecast for the previous period. In reference to the reductions in APA GasNet's costs, the AER concluded that APA GasNet's depreciation methodology did not promote efficient growth in the market for reference services because it had the effect of insulating customers from the cost reductions (by bringing forward cash flows in the short to medium term).

1006. ATCO considers that the HCA method is consistent with the National Gas Objective, the Revenue and Pricing Principles under the National Gas Law and rules 87(4) and 89 of the NGR, on the basis that it is more economically efficient and promotes efficient market growth. This is despite the ACT decision, that:

- the AER directed itself to the correct question and reached the view that it was not satisfied that APA GasNet's proposed [HCA] methodology promoted efficient growth in the market for reference services;
- the findings of fact made by the AER were not erroneous;
- the AER's conclusions based upon those findings of fact were not unreasonable in all the circumstances;
- there had not been an exercise of the limited discretion allowed for under rule 89(3) which was misunderstood or which was incorrect in all the circumstances.

Implications of HCA versus CCA for efficient growth in the market

1007. ATCO engaged NERA to provide an opinion on which approach best meets rule 89(1)(a) of the NGR: the HCA approach, the CCA approach utilising the AER's PTRM approach, or ATCO's proposed transitional approach.

1008. NERA notes that the efficient growth in the market for reference services will be promoted by tariffs that reflect the marginal cost of providing the particular service. NERA considers that an allocatively efficient tariff is best achieved through the use of a two-part tariff:

- the variable tariff being set to Long-run Marginal Cost (**LRMC**); and

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504 Australian Competition Tribunal, *Application by APA GasNet Australia (Operations) Pty Limited (No 2) [2013] ACompT 8*, 19 September 2013, p. 49.

- the fixed tariff being set to recover the residual revenue requirement in that year.

1009. NERA states that it follows that the depreciation schedule that best promotes efficient growth in the market for reference services – as required by rule 89(1)(a) of the NGR – will be that which minimises the extent of departure from LRMC pricing, where that departure is required to recover the initial investment.

1010. NERA maintains that ATCO's LRMC is likely to fall in real terms over time. NERA states that ATCO is a capital intensive business as more than 55 per cent of its total costs are capital costs. In its base case scenario, with 2.5 per cent real capital growth per annum over the period 2020 to 2080, NERA contends that this proportion will increase to approximately 85 per cent by 2080. NERA also states that the price of capital goods will fall over time as technological progress results in improvements in the efficiency with which capital assets are created. Therefore, NERA concludes that the LRMC of gas pipeline services provided by ATCO will fall as:

- capital expenditures are greater than operating expenditures and this difference is expected to increase over time; and
- in real terms, capital costs are expected to fall over time by a much greater amount than operating costs are likely to increase.

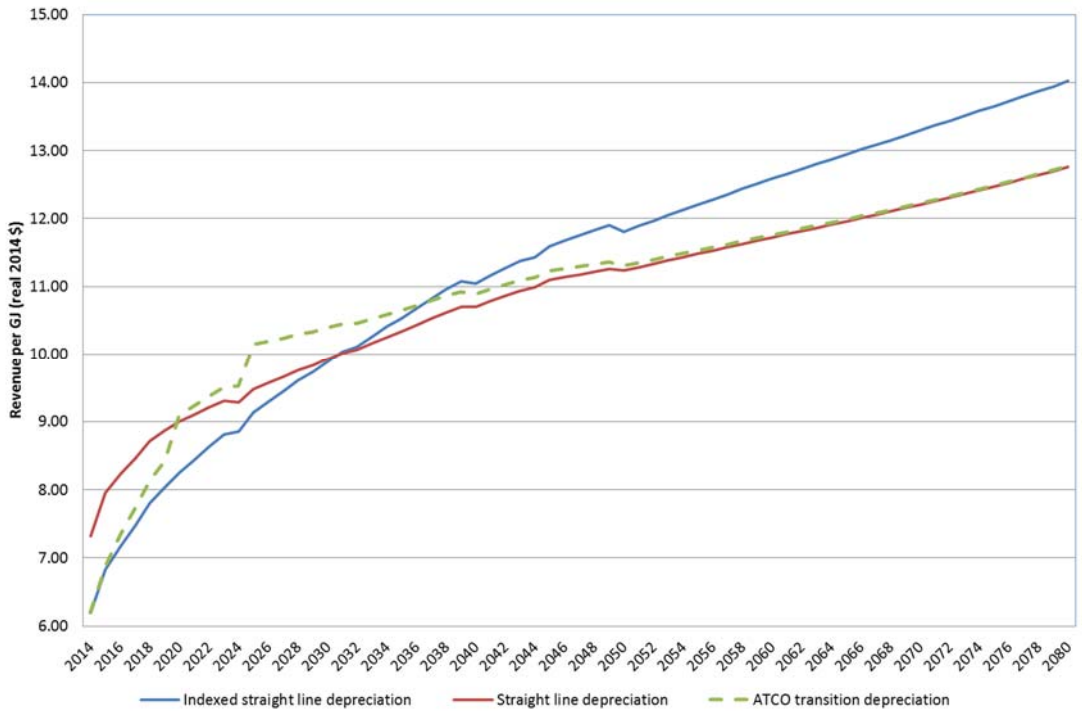
1011. NERA assessed the revenue and long term price levels for three different potential depreciation options using a post-tax revenue model framework over the 65 year period through to 2080. NERA used a building block approach that comprised common assumptions, except for depreciation. The principal input assumptions are:

- a nominal vanilla rate of return of 8.53 per cent is applied for the period post 1 July 2014;
- a forecast inflation rate of 2.5 per cent is applied for the period post 1 July 2014;
- tax depreciation uses the company income tax rate (30 per cent) and the value of imputation credits created (25 per cent) to calculate the level of tax compensation;
- operating costs rise in real terms at 3.2 per cent per annum nominal on average (0.7 per cent real);
- demand for gas delivered (GJ) rises at 1 per cent to 1.9 per cent per annum, and there is an increase in the numbers of delivery points (the latter at 2.4 per cent tailing down to 0.8 per cent); and
- capital expenditures rise in real terms at a steady 2.5 per cent per annum from 2020 out to 2080 (5 per cent in nominal terms), building on ATCO's proposed capital expenditure for the period 2015 to 2019.

1012. Figure 33 taken from the NERA report illustrates the resulting indicative revenue recovery per GJ over the 65 years for its base case.[505] The HCA approach (straight line depreciation) brings forward revenue compared to the CCA approach (indexed straight line depreciation).

[505] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 13, p. 30.

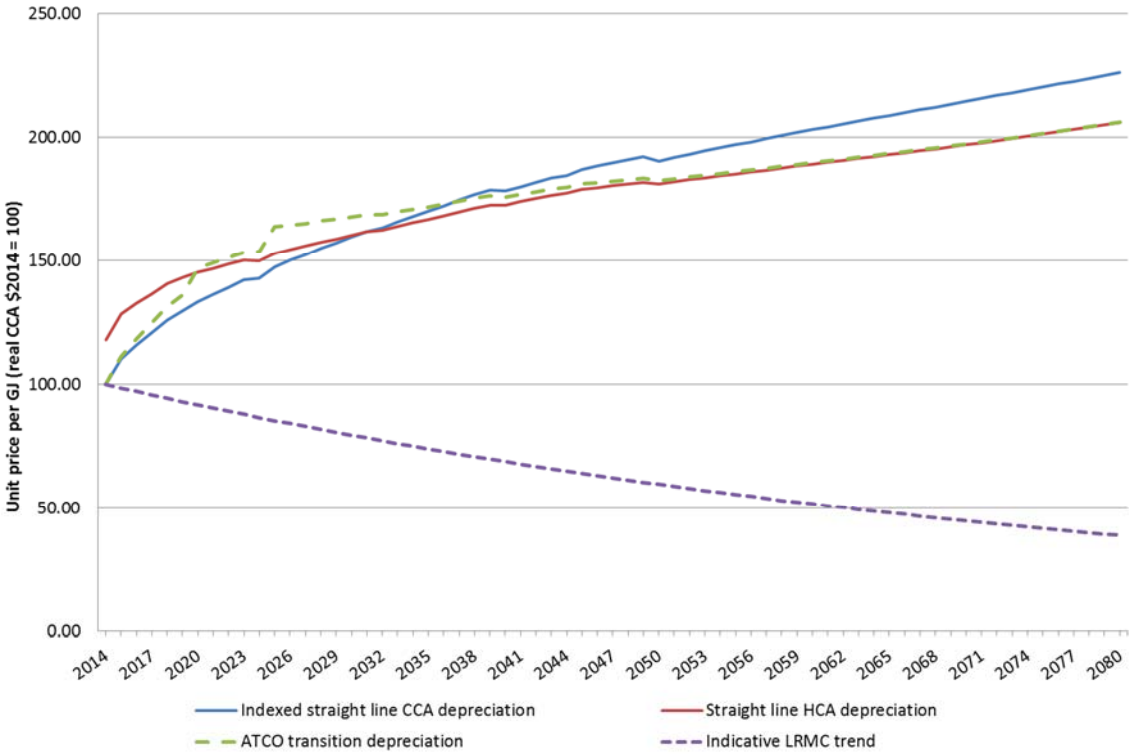
Figure 33 Comparison of depreciation methods: revenue per GJ ($ 2014 real)



Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Appendix 13, p. 30.

1013. The resulting change in unit price per GJ has a less pronounced slope under HCA as compared to CCA, bringing it closer to the purported indicative LRMC trend.

Figure 34 Comparison of depreciation methods: change in unit price per GJ and indicative LRMC trend ($ real)



Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Appendix 13, p. 35.

1014. NERA concludes that the depreciation schedule that best promotes efficient growth in the market for reference services – as required by rule 89(1)(a) of the NGR – will be the HCA approach, as it minimises the extent of departure from the purported LRMC trend. NERA maintains that nominal HCA depreciation will be more 'flat' than CCA – leaving less of a gap to an argued declining LRMC over the longer term, as shown in Figure 34.

1015. The Authority has examined the revenue and LRMC claims made by NERA associated with the HCA and CCA depreciation approaches.[506] The Authority has concluded that NERA's analysis is flawed, and therefore that NERA's claims with regard to the CCA approach are not supported, because:

- a realistic portrayal of future revenue shows that the average revenue per GJ is declining over time under both depreciation approaches, implying that the long run marginal revenue must be declining under both approaches; and
- evidence relating to the trend for the LRMC of gas services does not support the conclusion that it will decline strongly in future, but may even remain flat in real terms.

1016. The conclusions at paragraph 1013 are discussed in more detail in what follows.

Future revenue path

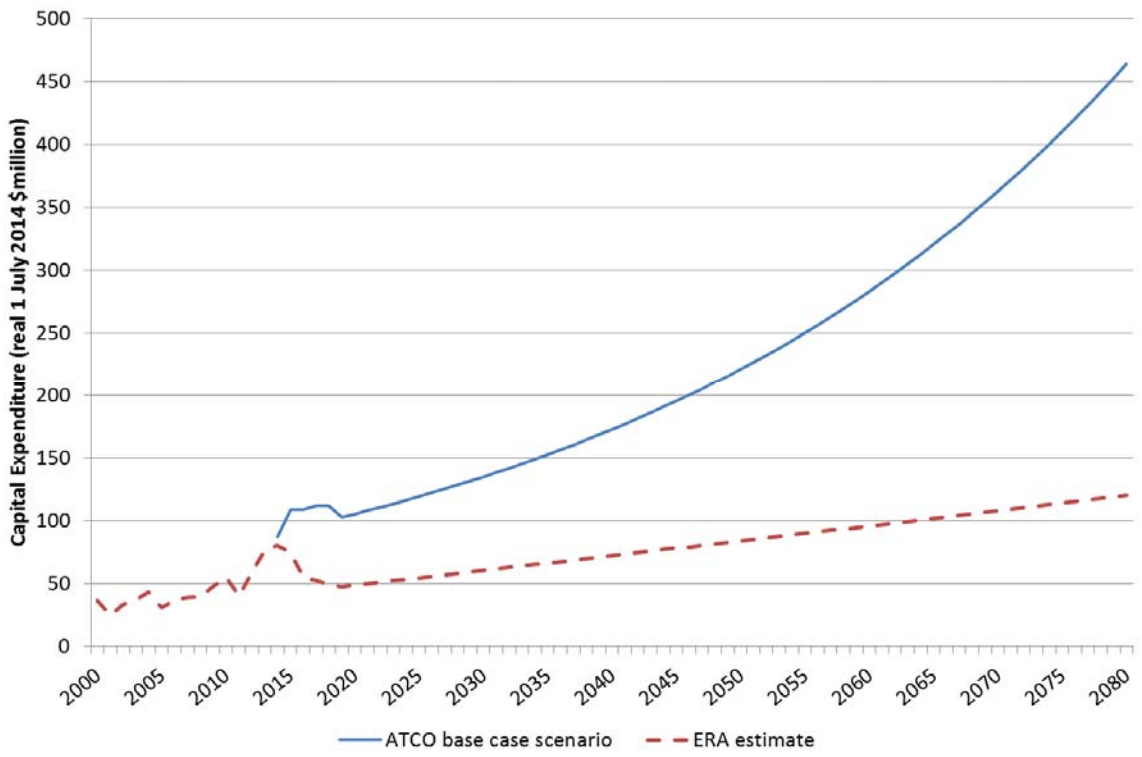
1017. The shape of sharply rising revenue path through to 2080 is driven, first, by the assumed very high levels of initial capital expenditure proposed by ATCO over the period 2015 to 2019, and second, by subsequent high growth rates on that initial capital expenditure base, of 2.5 per cent real (5 per cent nominal) over the period 2020 to 2080.

1018. The high initial capital expenditures are based on ATCO's access arrangement proposal, which the Authority has rejected for the reasons described in the projected capital base 'required amendments' section (see paragraphs 530 to 533). To correct this, the Authority inserted the capital expenditures approved for this draft decision into NERA's model for the period 2015 to 2019 (Table 36).

1019. The Authority also applied a lower growth assumption for capital expenditure for the period 2020 to 2080, to be consistent with NERA's assumed rate of new connections (that is, growth at an initial 2.5 per cent, tailing down to 2 per cent by 2030, and further to 1 per cent by 2080). The resulting difference between the Authority's capital expenditure path and that of NERA's base case is substantial (Figure 35).

[506] For this purpose, the Authority requested NERA's spreadsheet model, which ATCO provided. In what follows, the Authority did not vary any of the common assumptions, contained within NERA's spreadsheet model, in order to ensure that it was evaluating NERA's claims on a consistent basis. The Authority's use of the common assumptions in its analysis of the NERA spreadsheet model does not, in any way, constitute acceptance by the Authority of the common assumptions. However, these are second order issues in the context of this specific evaluation.

Figure 35 Capital expenditure: NERA base case and ERA scenarios compared (real $)



Source: ERA estimates, informed by NERA modelling

1020. The Authority considers that growing capital expenditure at the rate of new connections from 2020 on is justifiable. It provides for a steady linear increase in capital expenditure, which is consistent with the historic average trend (Figure 35).[507] It is also broadly consistent in trend terms with the expected population growth for Western Australia.[508]

1021. This contrasts with the rapid growth rate for capital expenditure of 2.5 per cent in real terms that is assumed by NERA in its base case. The Authority considers that the NERA base case assumptions are internally inconsistent. First, the NERA assumed capital growth implies that real capital expenditure will increase by a factor of five over the period (Figure 35). Second, NERA considers that the LRMC of ATCO's pipeline services will decline by more than 50 per cent, driven by sharply decreasing costs per unit of capital installed (Figure 34).[509] The implication is that the amount of new pipeline capital services installed *annually* will increase by a factor of more than 10 by 2080, as compared to the current capital expenditure levels. The Authority considers that this is unlikely. It implies unbroken growth in real pipeline services investment of 4 per cent per annum over the long period. This may be compared to the 3.7 per cent per annum growth rate over the period 2000 to 2009, which was a time of

507 The Authority notes that even this rate is optimistic, given the substantial slowing in the growth rate in new connections (see Table 8 in the Demand section). However, the results modelled here are somewhat less sensitive to the assumed future growth rate over 2020 to 2080, and more sensitive to the assumed starting base at 2019. For these reasons, the Authority has accepted NERA's connections growth rate for the period 2020 to 2080 for the illustrative purpose of this section.

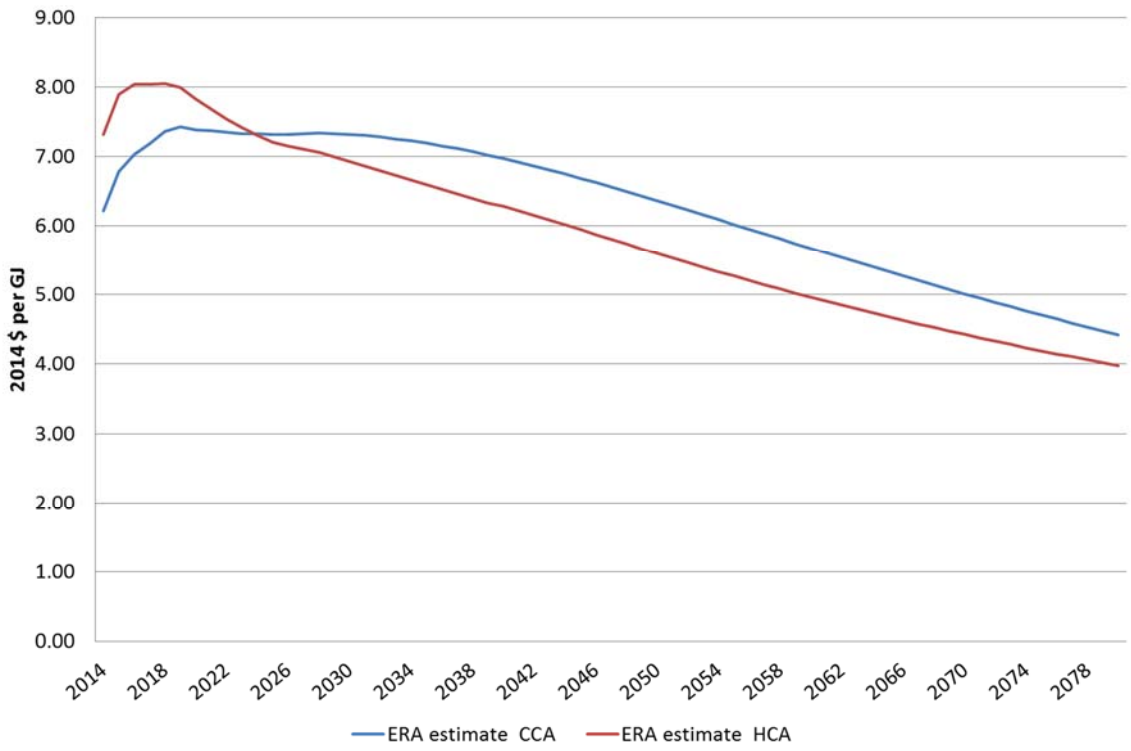
508 See Australian Bureau of Statistics, *Population projections, Australia, 2012 (base) to 2101*, catalogue 3222.0.

509 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 13, pp. 24-25.

unprecedented boom in Western Australia. It was also a period prior to the significant decline in the average annual consumption of B1 residential customers; that is, before the impact of improved housing standards and changes in energy preferences by consumers took full effect.

1022. With the lower capital expenditure assumptions, consistent with the Authority's scenario set out in Figure 35, the shape of the indicative revenue and unit cost curves change markedly (Figure 36). Both the CCA and HCA depreciation approach curves exhibit a declining cost trend over time in the Authority's capital expenditure scenario.

Figure 36 Total revenue per GJ ($ real)



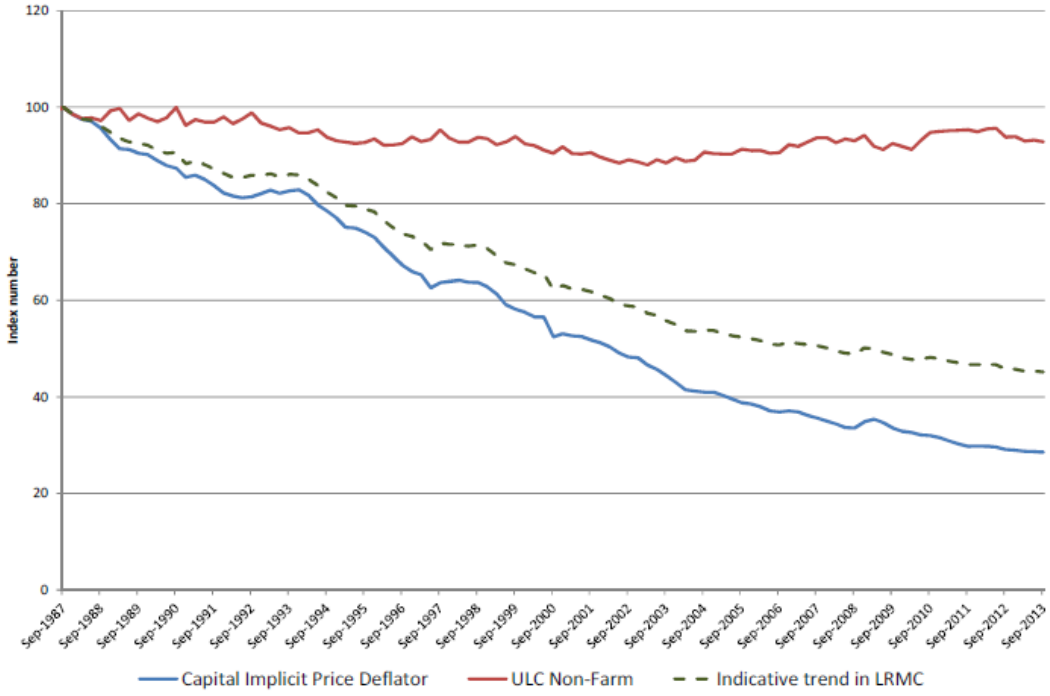
Source: ERA estimates, informed by NERA modelling.

Future LRMC path

1023. The second part of NERA's claim is the declining LRMC of the provision of gas pipeline services. NERA presents evidence, which it purports to be the implicit price deflator for the services provided by ATCO, in Figure 37. In particular, NERA implies that the capital price deflator trend in Figure 37 is based on published Australian Bureau of Statistics (**ABS**) data relating to 'Electricity, Gas, Water and Waste Services'.[510]

[510] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 13, p. 22.

Figure 37 Constant price indices: indicative LRMC trend, capital implicit price deflator and unit labour costs (non-farm)



Source: ATCO Gas Australia, Access Arrangement Information*, 17 March 2014, Appendix 13, p. 25.*

1024. However, investigation by the Authority suggests that NERA would appear to have used total capital expenditure data from the ABS industry series 'Other selected industries' to calculate the capital implicit price deflator in Figure 37.[511] The Authority notes that the composition of this Other selected industries sector includes:[512]

- Electricity, Gas, Water and Waste Services (Division D);
- Construction (Division E);
- Wholesale Trade (Division F);
- Retail Trade (Division G);
- Transport, Postal and Warehousing (Division I);
- Information Media and Telecommunications (Division J);
- Finance and Insurance (Division K, excluding ANZSIC class 6330, Superannuation Funds);
- Rental, Hiring and Real Estate Services (Division L);
- Professional, Scientific and Technical Services (Division M);
- Other selected services: Accommodation and Food Services (Division H);
  - Administrative and Support Services (Division N);

511 NERA note that in footnote 22 of its report that it used ABS tables 5625.0 Table 1E and Table 3B for the purpose of its calculation. These tables only include the main industries, including 'Other selected industries'.

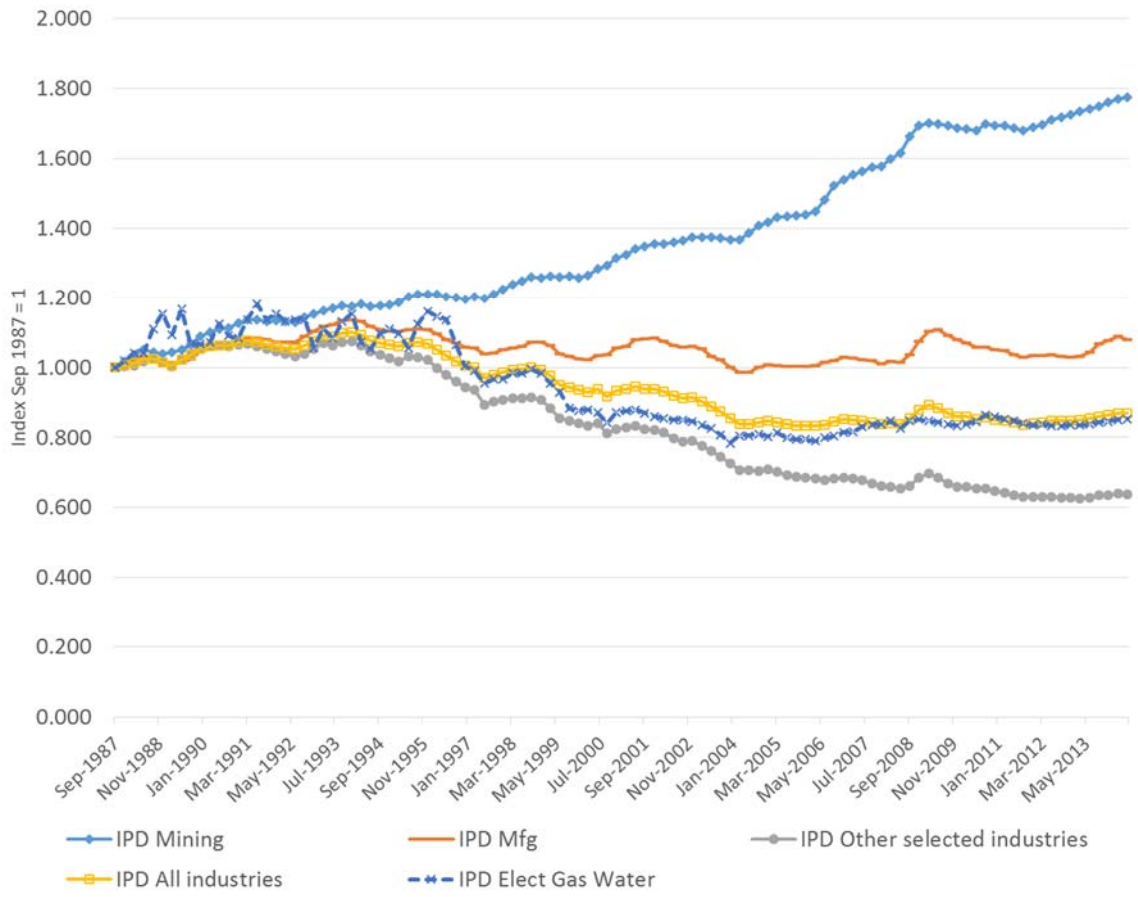
512 Explanatory notes in Australian Bureau of Statistics, *5625.0 – Private New Capital Expenditure and Expected Expenditure*, Australia, June 2014.

- Arts and Recreation Services (Division R);
- Other Services (Division S).

1025. Much of the declining trend in the implicit price in this Other selected industries series has been driven by services sectors with significant exposure to information technologies. However, gas pipeline services are capital intensive in a physical sense and not as exposed to this trend.

1026. To explore this further, the Authority estimated its own capital implicit price deflator series for Other selected industries, based on the data that is published by the ABS. In addition, the ABS provided the Authority with unpublished estimates of the chain volume expenditure for the Electricity, gas, water and waste industry, which allowed the Authority to estimate the implicit capital price deflator for that industry (Figure 38).

Figure 38 Capital implicit price deflators (IPD), by industry, 1987 to 2014



Note: IPD is Implicit Price Deflator

Source: ERA estimates, informed by ABS catalogue 5625.0 tables 2A and 3b, as well as unpublished ABS chain volume estimates for capital expenditure for the Electricity, gas, water and waste industries.

1027. It is apparent from Figure 38 that the evidence on the long run price of capital for the Electricity, gas and water industry is mixed. While there was a concerted downward trend in the price deflator in the period 1995 to 2003, this will have reflected the productivity gains unlocked by the microeconomic reform of the industry during that period. Since that time the trend has reverted to that seen prior to 1995, with a flat to slightly rising capital implicit price deflator, which diverges away from that of Other selected industries. When combined with rising wage outcomes for the industry, as

noted by NERA,[513] this suggests that the overall trend for the Electricity, gas, water and waste price index, and hence its LRMC, is flat or even slightly increasing.

1028. The long term estimates are necessarily indicative, but on the basis of its analysis the Authority is not convinced that the LRMC of ATCO's services will decline strongly into the future. It is entirely feasible, given the relatively mature nature of gas pipeline technology, that LRMC could remain flat.

1029. Given its analysis on the shape of the revenue per GJ curve, and the potential for fairly flat LRMC, the Authority does not agree with NERA's analysis and concludes that there is no strong evidence to suggest that the gap between unit prices and LRMC is likely to be reduced by shifting to HCA for depreciation. Furthermore, given potential outcomes for LRMC – of flat or at most slightly declining costs over time – the CCA approach could provide for a superior approach in terms of signalling efficient use over time, as compared to HCA.

Impact of HCA approach on consumers

1030. Importantly, the Authority considers that the magnitude of the revenue increase in the short to medium term in the change to HCA is significant, even if smeared over a number of years, as proposed by ATCO in its transition approach. The Authority notes that there would be on average a 1.5 per cent increase in revenues over the 2014–19 access arrangement period, all other things equal, if ATCO used the transition method for depreciation. The transition approach therefore results in significant price pressure.[514] The Authority does not consider that this is in the interests of *all* consumers; current consumers would be paying significantly higher tariffs, all other things being equal, while future customers pay lower tariffs. Given the lack of justification for this on efficiency grounds, this implies there is, in effect, a subsidy from current customers to future customers.

1031. In its submission on the proposed revision of the GDS access arrangement, Kleenheat Gas expressed concern with the short to medium term impact of the proposed transition from CCA to HCA. Kleenheat Gas states that higher tariffs in the short term will create a barrier to entry for some customers connecting to natural gas and that this is counterintuitive to promoting efficient growth in the natural gas market.

1032. The Authority considers that, even if the additional revenues from the change of approach are offset to a degree by falls in other building block components, the price impact cannot be ignored. Customers would be entitled to expect prices to fall if the other cost components are reduced. The regulatory regime is not intended to shield a service provider from such reductions.

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513 For evidence on rising wages in the Energy and water sector, see ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 13, Figure 4.2, p. 24.

514 This consideration applies irrespective of whether overall tariffs are increasing or decreasing. As noted by the ACT in its decision, considerations of the impact of the depreciation method on the stability of the tariff path, and hence on the efficient growth in the market for reference services, should be separated from the impacts of other factors influencing tariffs (Australian Competition Tribunal, *Application by APA GasNet Australia (Operations) Pty Limited (No 2) [2013] ACompT 8*, 19 September 2013, p. 51).

Further impacts of the HCA approach

1033. The Authority also considers that the CCA approach has advantages in signalling efficient use of the GDS both now and in the future.

1034. The Authority considers that the proposed HCA approach unnecessarily discourages demand early in an asset's life (due to the relatively higher prices at this time) and then encourages greater use near the end of its life (due to relatively lower prices). The Authority is therefore of the view that the proposed HCA approach could discourage efficient gas usage and upstream and downstream investment at the current time, given the higher tariffs that result.

1035. Furthermore, as ATCO's assets near the end of their useful lives, over utilisation might be encouraged through inefficiently low prices. This may also lead to inefficient over-investment in their own assets by upstream and downstream users of the pipeline. Over utilisation of ATCO's assets may also result in the replacement being required sooner than otherwise necessary.

1036. At the same time, ATCO's proposed HCA approach leads to a lower depreciated historical cost valuation of the capital base relative to the CCA approach. This may create an incentive for ATCO to replace assets sooner than may otherwise be the case, so as to be able to earn a higher return on the replacement cost of a new asset.

1037. The steeper recovery profile of revenues under ATCO's approach also means that all future capital expenditure will be recovered more quickly. Any step up in capital expenditure will cause a greater step up in revenues than would be the case under the CCA approach. The Authority considers the resulting incentives under the HCA approach are not consistent with efficient development of the market.

Conclusion of Authority regarding whether HCA approach promotes efficient growth in the market for reference services

1038. The Authority considers that ATCO's proposed HCA depreciation approach – and equally, its transition approach – are not depreciation schedules in which the reference tariff, varies, over time, in a way that promotes efficient growth in the market for reference service. ATCO's proposed HCA approach, combined with the associated transition approach, is not consistent with the criteria in rule 89(1)(a) of the NGR, because it would:

- not promote efficient growth in the market for reference services as the Authority is of the view that – once the approach in NERA's analysis is appropriately configured (as described in paragraphs 1017 to 1022) – prices under the HCA approach are likely to diverge to a greater extent from LRMC than under the CCA approach (as described in paragraphs 1023 to 1029);
- lead to an unnecessary price shock in the near term (and potential price shocks in the future as significant assets are replaced), thereby unnecessarily discouraging demand due to the resulting relatively higher prices and thereby lead to potential inefficient investment in the pipeline itself, as well as by users upstream and downstream (as further described in paragraphs 1030 to 1032);
- act to discourage efficient management of the pipeline assets, particularly as the assets near the end of their effective lives, which will lead to the potential inefficient use of the assets of upstream and downstream users during that time, and potential distortions in incentives for investment by those users during that time (as further described in paragraphs 1033 to 1037).

NGR 89(1)(b) – (e) – consistency of HCA approach with applicable criteria

1039. The Authority considers that generally both the HCA and CCA depreciation approaches meet the requirements of NGR 89(1)(b) to (d), as both approaches:

- enable assets to be depreciated over their economic lives (NGR 89(1)(b));
- allow for adjustments reflecting changes in the expected economic lives of particular assets (NGR 89(1)(c));
- allow for assets to be depreciated only once (NGR 89(1)(d));
- allow for the service provider's reasonable needs for cash flow to meeting financing, non-capital and other costs (NGR 89(1)(e)).

Compliance with requirements of the NGL

1040. For the reasons outlined in paragraphs 1023 – 1037 above, the Authority considers that ATCO's proposed HCA approach is not consistent with the National Gas Objective with regard to the promotion of efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers. Further, the Authority considers that the HCA approach leads to subsidies from current to future consumers, which is not in the long term interests of all consumers.[515]

1041. The Authority considers that ATCO's proposed HCA depreciation approach does not comply with the Revenue and Pricing Principles under the NGL as it increases the risk of potential under or over utilisation of the pipeline at particular points in time, with attendant economic costs.

1042. Therefore, Authority does not approve ATCO's proposed HCA transition approach for depreciation, as ATCO's proposed HCA transition approach:

- is not consistent with rule 89(1)(a) of the NGR; and
- does not comply with the National Gas Objective under the NGL.

1043. The Authority requires that ATCO adopt the CCA approach for its depreciation schedule for the regulatory asset base. The Authority considers that the CCA approach is consistent with the applicable criteria under rule 89(1) of the NGR, and complies with the NGL. Unlike the HCA, the CCA approach has advantages in:

- signalling efficient use of the GDS both now and in the future, thereby achieving efficient growth in the market of reference services;
- encouraging efficient production and investment decisions by the service provider, as well as by upstream and downstream consumers;
- avoiding price shocks for consumers, both for the forthcoming access arrangement, and also at the end of the economic lives of major assets;
- avoiding subsidies between current and future consumers, thereby ensuring outcomes that are in the long term interests of consumers with respect to price.

1044. The Authority notes that the CCA approach may be achieved in a nominal building block model by using the AER's PTRM approach to depreciation. Table 52 sets out

[515] Rule 40(2) of the NGR notes that the Authority may insist on a change to an aspect of a depreciation schedule governed by rule 89 if it considers change necessary to correct non-compliance with a provision of the Law or an inconsistency between the schedule and the applicable criteria.

the Authority's required depreciation amounts for the fourth access arrangement period, derived using the CCA approach.

Table 52 Authority's Approved Forecast Depreciation Calculation: 2014 to 2019

Nominal $ million	July to Dec 2014	2015	2016	2017	2018	2019	Total
Forecast depreciation on indexed capital base 1 July 2014 (straight line depreciation on indexed CCA capital base)	15.06	36.23	39.98	43.22	46.80	50.58	231.87

Source: ERA, GDS Tariff Model, October 2014.

1045. Table 53 shows the projected capital base at 31 December 2019.

Table 53 Authority's Approved Projected Capital Base: 2014 to 2019

Real $ million at 30 June 2014	July to Dec 2014	2015	2016	2017	2018	2019
Closing capital base	1,021.44	1,054.34	1,069.09	1,077.36	1,082.63	1,079.82

Source: ERA, GDS Tariff Model, October 2014.

Depreciation for rolling forward capital base

1046. Clause 9.1(a) of ATCO's proposed access arrangement provides for the calculation of the opening capital base for the GDS for the next access arrangement period. ATCO proposed that depreciation over the Current Access Arrangement Period is to be the sum of:

> i) depreciation as forecast; and
>
> (ii) depreciation of any unanticipated Regulatory Capital Expenditure for the Current Access Arrangement Period (being depreciation calculated in accordance with Clause 3 of Annexure B of this Access Arrangement.).

1047. Clause 9.1(b) of ATCO's proposed access arrangement provides that for the calculation of the opening capital base for the GDS for the next access arrangement period the capital assets in existence at 30 June 2014 are to be indexed for inflation to 1 January 2020.

1048. Clause 9.1(c) of ATCO's proposed access arrangement provides that for the calculation of the opening capital base for the GDS for the next access arrangement period, no amounts other than the amount in paragraph (b) are to be indexed for inflation.

1049. The Authority notes that, in accordance with rule 90 of the NGR, ATCO has proposed to depreciate the capital base for the next access arrangement period based on the forecast capital expenditure for the forthcoming access arrangement period. The Authority accepts that this part of ATCO's clause 9.1(a) complies with the requirements of rule 90 of the NGR. However, the Authority requires that clause 9.1(a) make clear that depreciation will be based on the current cost accounting approach.

1050. The Authority does not accept ATCO's proposals in clause 9.1(b) and 9.1(c). As discussed in paragraph 1042, the Authority does not approve ATCO's proposed

transitional depreciation method and therefore rejects ATCO's proposal to only index the capital assets in existence at 30 June 2014 in clauses 9.1(b) and 9.1(c).

1051. The Authority requires ATCO to calculate the opening capital base for the GDS for the Next Access Arrangement Period by escalating it at the rate of inflation as measured by the CPI All Groups, Weighted Average of Eight Capital Cities.

Asset lives

1052. ATCO has adopted the same asset lives that were approved by the Authority in the third access arrangement period, apart from high pressure mains. In the case of high pressure mains, ATCO has proposed revising the life of high pressure steel and plastic mains down from 120 years to 80 years and 60 years, respectively.

1053. EMCa reviewed ATCO's proposal to reduce the economic asset lives of its high pressure steel and plastic pipelines. EMCa considers ATCO's proposal is reasonable and in line with industry practice. EMCa's review of the lives adopted by other distribution businesses revealed that a 120 year life is far higher than the lives assumed by any distribution pipeline owner for both steel (50-80 years) and plastic (50-80 years) high pressure mains.[516]

1054. The Authority has considered EMCa's advice regarding high pressure pipelines and is satisfied that ATCO's proposed asset lives meet the requirements of rule 88 and is consistent with the applicable criteria in rule 89 of the NGR.

1055. ATCO proposes that the life for all assets remains the same as that which was adopted in the third access arrangement period other than in relation to high pressure assets. However, it appears that ATCO has reduced the economic life for vehicles from 10 years to 5 years in Table 78 of its access arrangement information.[517] ATCO introduced a new asset class for vehicles in the fourth access arrangement period that just contains fleet. Vehicles were part of the equipment and vehicles asset class in the third access arrangement period, which had an asset life of 10 years.

1056. ATCO has not identified this proposed change in asset lives for vehicles or provided any justification for the reduction in asset lives. Therefore, the Authority is not satisfied the proposed 5 year asset life for vehicles is consistent with the applicable criteria of rule 89 of the NGR. The Authority requires ATCO to justify why changing the asset life for vehicles from 10 to 5 years is consistent with rule 89 of the NGR.

Required Amendment 11.

The Authority requires that ATCO adopt the current cost accounting approach to depreciation, based on the indexed value of the calculated real depreciation and amend section 9 (Depreciation) to ensure that it is consistent with the current cost accounting approach.

The Authority requires that ATCO amend section 9.1 of its access arrangement as follows:

516 EMCa, *Review of Technical Aspects of the Proposed Access Arrangement*, June 2014, pp. 136-137.

517 ATCO Gas Australia, *Access Arrangement Information, 17 March 2014*, Table 78, p. 222.

(a) For the calculation of the nominal (indexed) Opening Capital Base for the WAGN AGA GDS for the Next Access Arrangement Period, depreciation over the Current Access Arrangement Period is to be calculated in accordance with the real straight line depreciation method – where the real opening capital base in any year is divided by the remaining asset life – and then converted to nominal terms by applying indexation to the calculated real annual depreciation, and is to be the sum of:

(i) indexed real depreciation on the Opening Capital Base over the Current Access Arrangement Period;

(ii) indexed real depreciation of the forecast Capital Expenditure for the Current Access Arrangement Period (being the amount of forecast Capital Expenditure used for the purpose of determining Haulage Tariffs for the Current Access Arrangement Period); and

(iii) indexed real depreciation of any unanticipated Regulatory Capital Expenditure for the Current Access Arrangement Period (being depreciation calculated in accordance with Clause 3 of Annexure B of this Access Arrangement).

(b) For the calculation of the Opening Capital Base for the WAGN AGA GDS for the Next Access Arrangement Period, each of:

(i) the nominal (indexed) Opening Capital Base (end of period) for the Current Access Arrangement Period adjusted for any difference between estimated and actual nominal (indexed) Capital Expenditure included in that Opening Capital Base. This adjustment must also remove any benefit or penalty associated with any difference between the estimated and actual capital expenditure;

(ii) nominal (indexed) Conforming Capital Expenditure made, or to be made, during the Current Access Arrangement Period;

(iii) any nominal (indexed) amounts added to the Capital Base under rule 82, rule 84, and rule 86 of the National Gas Rules;

(iv) nominal (indexed) depreciation over the Current Access Arrangement Period (calculated in accordance with paragraph 9.1(a));

(v) nominal (indexed) value of redundant assets identified during the course of the Current Access Arrangement Period; and

(vi) the nominal (indexed) value of Pipeline Assets disposed of during the Current Access Arrangement Period;

all indexed consistent with the rate of inflation as measured by the CPI All Groups, Weighted Average of Eight Capital Cities as at 31 December of each regulatory year.

The Authority requires that ATCO change the asset life for vehicles to ten years or provide justification to the Authority that the reduction to 5 years is consistent with rule 89 of the NGR.

Taxation

Regulatory Requirements

1057. Rule 76(c) of the NGR provides for the estimated cost of corporate income tax as a building block for total revenue.

1058. Rule 87A of the NGR elaborates on how to calculate the estimated cost of corporate income tax:

> 87A. Esimated cost of corporate income tax
>
> (1) The estimated cost of corporate income tax of a service provider for each regulatory year of an access arrangement period (ETC_t) is to be estimated in accordance with the following formula:
>
> $ETC_t = (ETI_t \times r_t)\ (1-\gamma)$
>
> Where
>
> ETI_t is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of reference services if such an entity, rather than the service provider, operated the business of the service provider;
>
> r_t is the expected statutory income tax rate for that regulatory year as determined by the [ERA]; and
>
> γ is the value of imputation credits.

ATCO's Proposed Changes

1059. ATCO has proposed to estimate the cost of corporate income tax directly by multiplying its estimated taxable income by an assumed statutory income tax rate of 30 per cent. Any estimated tax losses are carried forward to offset against taxable income. ATCO has reduced its estimated amount of tax payable by the value of imputation credits.

1060. ATCO has calculated taxable income as assessable income less tax deductible costs that are recognised by the Australian Taxation Office (**ATO**), as follows:[518]

- Net cost of service
- *plus* Capital contributions.
- *minus* Forecast operating expenditure.
- *minus* Proposed depreciation of the Tax Asset Base (**TAB**), which includes capital contributions, and depreciation of customer contributed commercial meter sets. ATCO has calculated proposed tax depreciation on a straight-line basis.
- *minus* Debt servicing costs, which ATCO has calculated by multiplying the debt portion of the opening capital base[519] by the debt to equity ratio (assumed at 60 per

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518 ATCO Gas Australia, *Tariff Model*, September 2014.

519 ATCO has used a different opening capital base to the RAB based on applying an historical cost accounting depreciation approach to the RAB in nominal dollars to derive an opening capital base for the debt servicing cost calculation in the tax module.

cent) and ATCO's proposed nominal cost of debt (cost of debt risk margin plus nominal risk free rate).

- *equals* Estimated taxable income.[520]

1061. ATCO initially proposed a corporate income tax building block of $40.47 million over the fourth access arrangement period.[521] Table 54 shows ATCO's updated estimated corporate income tax by year for the fourth access arrangement period, based on updated IT operating expenditure and capital expenditure, and updated UAFG operating expenditure.

Table 54 ATCO's Proposed Estimated Cost of Corporate Income Tax (AA4)

Real $ million at June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Estimated Cost of Corporate Income Tax	2.61	7.17	7.77	10.19	12.67	13.56	53.95
Value of Imputation Credits	(0.65)	(1.79)	(1.94)	(2.55)	(3.17)	(3.39)	(13.49)
ATCO's Proposed Estimated Cost of Corporate Income Tax Net of Imputation Credits	**1.95**	**5.38**	**5.83**	**7.64**	**9.50**	**10.17**	**40.47**

Source: ATCO Gas Australia, Tariff Model, September 2014.

1062. Ernst & Young was engaged by ATCO to estimate the opening TAB at 1 July 2014 by taking into account the following:

- The date the business was first subject to tax.
- Tax value of assets at that date, separating between the Regulatory Asset Base (**RAB**) and non-RAB.
- Profile of RAB when first subject to tax, including any capital expenditure that took place before the business was first regulated.
- Rolling forward of TAB from when first subjected to tax to commencement of post-tax approach, taking into account tax depreciation, actual capital expenditure and asset disposals.

1063. The Ernst & Young consultant noted that he was instructed by ATCO to make the following assumptions:[522]

> a. The data provided to me in respect of the assets held by ATCO Gas Australia as at 30 June 2000, and subsequent acquisitions and disposals to 30 June 2011, contained in the tax fixed asset registers is a complete record. Further, I have assumed that all assets listed in the schedules provided existed as at this date and were the property of ATCO Gas Australia for the period they are shown as being owned by ATCO Gas Australia. I have assumed, except where otherwise stated, that the cost data and acquisition date provided to me for these assets is accurate.
>
> b. As at 30 June 2000, AlintaGas Networks (the former name of ATCO Gas Australia) was privatised. At this date, accounting and tax values for regulated tax assets were

520 ATCO also accounts for carried forward tax losses in this calculation.

521 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 82, p. 263.

522 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 26: Review of regulated tax asset base for regulated revenue purposes, p. 5.

established. Division 58 of ITAA97 provides special rules which apply in calculating deductions for the decline in value of depreciating assets and balancing adjustments for assets which were held by an exempt entity and are subsequently held by a taxable entity.

c. I have been advised a reconciliation was performed at the time of privatisation by KPMG and a methodology was devised to ensure all assets were transferred with the correct descriptions, cost, acquisition date, accumulated depreciation and written down value. I have sighted a high level reconciliation of the broad asset categories and values allocated at the date of privatisation, however I have not sighted confirmation that the methodology proposed was enacted in full. I have compared the tax written down value set out in the reconciliation document and an AlintaGas internal memorandum regarding the KPMG analysis dated 9 May 2001 to the tax written down value as at 30 June 2000 in the detailed fixed asset register provided to me by ATCO Gas Australia, and note these values differ by approximately 5.5 per cent (with the detailed register disclosing a lower written down value).

ATCO Gas Australia has provided me with a reconciliation of this difference. This difference is primarily constituted of Work in Progress (WIP) and non-regulated assets of non-distribution entities within the group. The remaining unidentified discrepancy is approximately 0.2 per cent of the total tax written down value. My conclusion is that the tax written down value of the privatised regulated assets as set out in the detailed fixed asset register as at 30 June 2000 is appropriate.

d. As at 23 July 2003, AlintaGas Networks was acquired by WA Network Holdings (previously Alinta Network Holdings), and the tax base values of the regulated assets were reset for tax purposes. A step down in value of approximately $72m was included in the tax base.

e. As at 29 July 2011, ATCO Australia acquired 100 per cent of WA Gas Networks (subsequently renamed ATCO Gas Australia). As part of this acquisition, the tax base values of the regulated assets were reset for tax purposes, which resulted in a step up in the tax base.

f. For the purpose of calculating a regulated tax asset base, income tax consolidation adjustments which reset the tax bases of the regulated assets have been disregarded. We discuss the rationale for this further in the paper.

g. I have accepted the estimated additions for the period 1 July 2011 to 30 June 2014, and the forecast additions for each subsequent period to the year ended 31 December 2019, that I have been provided with.

h. As part of determining the opening depreciable starting base, I have reviewed the effective lives applied to the assets by ATCO Gas Australia.

1064. ATCO notes that Ernst & Young calculated the opening TAB at 1 July 2014 from:[523]

ATCO Gas Australia's fixed asset register as at 23 July 2003, including all contributed and gifted assets. The fixed asset register has been restated to 30 June 2000 by removal of accumulated depreciation and additions subsequent to that date.

Additions and disposals for the periods ending 31 December 2000, 31 December 2001, 31 December 2002, 31 December 2003, 31 December 2004, 31 December 2005, 31 December 2006, 31 December 2007, 31 December 2008, 31 December 2009, 30 June 2010 and 30 June 2011, including all contributed and gifted assets.

Forecast additions and disposals for the periods ending 30 June 2012, 30 June 2013 and 30 June 2014.

[523] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 260.

Depreciation based on effective lives used for depreciation purposes using the prime cost method.

1065. Ernst & Young has calculated the opening TAB as at 1 July 2014 as $495,305,697.[524] This TAB:[525]

- excludes unregulated assets;
- includes commercial meters in the initial capital base;
- excludes land on the basis that it is not depreciable for tax purposes;
- incorporates contributed and gifted assets, which Ernst & Young states is required by the income tax legislation; and
- uses the prime cost method of depreciation.[526]

1066. The Ernst & Young consultant noted the following:[527]

> As at 29 July 2011, ATCO Australia acquired 100 per cent of WA Gas Networks (subsequently renamed ATCO Gas Australia). As part of this acquisition, the tax base values of the regulated assets were reset for tax purposes, which resulted in a step up in the tax base.
>
> For the purpose of calculating a regulated tax asset base, income tax consolidation adjustments which reset the tax bases of the regulated assets have been disregarded.

1067. Ernst & Young has not elaborated on the rationale for disregarding resets to the tax asset base as at 29 July 2011, upon ATCO acquiring the assets that constitute the GDS.

1068. ATCO has rolled forward the TAB for the fourth access arrangement period from 1 July 2014 to 31 December 2019 by adding capital expenditure (including capital contributions) and deducting depreciation.

1069. Table 55 presents ATCO's calculation of the closing TAB for the fourth access arrangement period.

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524 This value is in nominal dollars.

525 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 26: Review of regulated tax asset base for regulated revenue purposes, p. 8.

526 Ernst & Young state (ATCO Gas Australia 2014, *Access Arrangement Information: 1 July 2014 – 31 December 2019 (AA4)*, www.erawa.com.au, March, Appendix 26: Review of regulated tax asset base for regulated revenue purposes, p. 8):

> …the prime cost method of depreciation is an election which is generally available under the provisions of the ITAA97. This method appears reasonable for the purposes of this exercise, as prime cost depreciation provides a consistent annual deduction over the life of an asset and it also appears to be consistent with the approach used by other regulatory authorities where a post-tax WACC is adopted.

527 Ernst & Young, Review of regulated tax asset base for regulated revenue purposes – ATCO Gas Australia, 18 December 2013.

Table 55 ATCO's Proposed Closing Tax Asset Base (AA4)

$ million nominal	July to Dec 2014	2015	2016	2017	2018	2019
Opening Tax Asset Base	497.49	518.82	573.90	633.84	696.91	761.33
ATCO's Forecast Capital Expenditure	46.51	109.73	121.23	126.50	129.09	134.53
ATCO's Forecast Depreciation	25.18	54.65	61.29	63.43	64.67	69.91
ATCO's Proposed Closing Tax Asset Base	**518.82**	**573.90**	**633.84**	**696.91**	**761.33**	**825.96**

Source: ATCO Gas Australia, Tariff Model, September 2014.

Submissions

1070. The Authority did not receive submissions in relation to ATCO's estimated cost of corporate income tax in the GDS access arrangement revision proposal.

Considerations of the Authority

1071. The Authority has assessed ATCO's proposed opening TAB and estimated cost of corporate income tax. The Authority has reviewed the following:

- ATCO's inclusion of capital contributions in the opening capital base.
- ATCO's inclusion of commercial meters in the initial capital base, and depreciation of commercial meters in its calculated tax depreciation.
- Tax asset lives that ATCO has proposed for calculating tax depreciation.
- Whether ATCO has included uncommissioned assets in the TAB.
- ATCO's tax depreciation methodology.
- ATCO's proposed cost of debt risk margin and nominal risk free margin for the calculation of debt servicing costs.

1072. The Authority has also revised ATCO's proposed taxable income in light of this Draft Decision's updated forecast operating expenditure, proposed opening and projected capital base.

Capital Contributions

1073. ATCO has proposed to include capital contributions and gifted assets in the TAB for the purpose of calculating tax depreciation. ATCO's consultant Ernst & Young states:

> Customer contributions and gifted assets should generally be taxable to ATCO Gas Australia in the year that the income is derived as a non-cash business benefit[528] or as ordinary income in the hands of ATCO Gas Australia.
>
> For ATCO Gas Australia, as the holder of the contributed asset, the corresponding deduction for the asset received should be over time, based on the relevant asset's effective life and nature. Therefore, there is a timing difference between when the income is assessed to ATCO Gas Australia and when the corresponding deduction (where available) can be claimed by ATCO Gas Australia.

[528] Section 21A ITAA36.

> I understand that contribution revenue and the corresponding asset received are recorded at an equal value, which is the fair value. I have been advised the value of contributed and gifted assets for the purpose of this review generally ranged from negligible to approximately $6.2m per year).
>
> As the above approach is consistent with the requirements of the tax legislation I have not removed the contributed assets from the opening depreciable tax base.

1074. The Authority accepts that capital contributions may lead to a tax liability for ATCO. However, the Authority does not consider that this tax liability should be included for the purpose of the calculating ATCO's regulated revenue.

1075. Including the capital contributions in the tax calculations for determining the regulated revenue would lead to *all* of ATCO's customers paying for a proportion of the contributed assets, to the extent that they generate a tax liability. This effect arises because if the value of a capital contribution is included in the regulatory taxation account, it would be counted as income for tax purposes in the year of receipt, resulting in a tax liability due in the same year. The related tax expense would then be passed through to all customers in that year, through the building block revenue calculations.[529]

1076. Ultimately, the tax expense paid by all customers may be less than the tax liability paid in the first year, as ATCO and thus its customers receive a reduction in the required tax cash flows over time, due to the depreciation of the contributed asset in the regulatory TAB.[530]

1077. Nonetheless, it is clear that including the contributed or gifted asset in the tax calculations increases the revenue requirement on all customers in the first year of the contribution. It is also clear that despite some net subsequent revenue reduction provided by the TAB depreciation, all customers ultimately end up paying a portion of the cost of the contributed asset. The cost paid by all the network customers is associated with the tax liability for the contributed asset, which would otherwise have been passed on to the user of the asset.

1078. The Authority considers that:[531]

- tax costs associated with capital contributions may not necessarily be associated with efficient costs - capital contributions are not included in the RAB, and thus are not evaluated in terms of rule 79 of the NGR that sets out the criteria for conforming capital expenditure as that incurred by a prudent service provider acting efficiently, and justified on economic, safety or regulatory grounds.
- to allow tax costs that are not associated with efficient costs to be charged to all customers would be inconsistent with the NGO and rule 87A of the NGR;

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529 The initial tax liability would be 30 per cent of the contribution, due in the year that the contribution was made. Circularity – for example relating to the requirement to pay tax on the additional compensation in the tax building block for the initial tax liability – lifts the initial payment from 30 per cent to around 43 per cent. Taking account of imputation credits on the effective tax rate, the net tax cost reduces to a 'grossed up' tax expense of around 18 per cent of the initial capital contribution or gifted asset value (assuming gamma is 0.5). This tax expense would be added to the required tax cash flows that are compensated in ATCO's revenue in that year.

530 Subsequent depreciation of the contributed asset through the TAB reduces the initial 18 per cent tax expense in NPV terms. The extent of the reduction will depend on the assumed asset life of the contributed asset and the time value of money (given by the WACC). In this example, the NPV tax cost might fall to around 15 per cent, given typical asset lives and WACC values.

531 For a detailed assessment of each of these points, see Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network*, 5 September 2012, pp. 243-251.

- it is unlikely that existing customers gain any benefit from contributed or gifted assets;
- the service provider does have a tax liability associated with a contribution, but given the objective of economic efficiency and the associated principle of 'user pays', this should be recovered from the contributor – to do otherwise would lead to a subsidy from the existing customer base to the contributing entity and the user of the asset;
- the service provider and the contributor are best placed to work out the commercial terms of the tax implications of any contribution, taking into account their business interests and tax positions.

1079. For the reasons outlined above, the Authority does not approve ATCO's proposal to include capital contributions and gifted assets in the TAB for the purpose of calculating tax depreciation. The Authority requires ATCO to calculate taxation expense in a manner that excludes capital contributions and gifted assets as such an approach is a preferable alternative to the proposal provided by ATCO and is an approach that complies the NGL and the NGR.

Commercial Meters

1080. ATCO includes commercial meters in its initial capital base, and depreciation of commercial meters in its calculated tax depreciation. ATCO has explained that commercial meter sets are not included in the RAB as costs for commercial meters are recovered either upfront from retailers, or through user specific charges.[532] According to ATCO, commercial meter sets are included in the asset base from which tax depreciation is calculated because ATCO remains the owner of the meter sets.

1081. The Authority does not accept ATCO's proposed inclusion of commercial meters in the initial capital base, and depreciation of commercial meters in tax depreciation, on the following basis:

- tax costs associated with commercial meters may not necessarily be associated with efficient costs;
- to allow tax costs that are not associated with efficient costs to be charged to all customers would be inconsistent with the National Gas Objective; and
- the service provider does have a tax liability associated with the commercial meter charge, but given the objective of economic efficiency and the associated principle of 'user pays', this should be recovered from the user – to do otherwise would lead to a subsidy from the existing customer base to the user.

1082. The Authority requires ATCO to exclude depreciation of commercial meters from tax depreciation, as such an approach is more consistent with the objectives and requirements of the NGL and the NGR.

Tax Asset Lives

1083. In order to calculate tax depreciation, ATCO has made asset life assumptions for the TAB.[533] Most of ATCO's assumptions can be justified by current taxation legislation or

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532 ATCO Gas Australia, *Email response to ERA43*, 11 August 2014.

533 ATCO Gas Australia, *Tariff Model*, September 2014.

taxation rulings. The Authority accepts ATCO's asset life assumptions that are consistent with current taxation legislation or taxation rulings.

1084. ATCO has confirmed to the Authority that its asset life assumptions for some TAB asset classes 'could be out of line with current income tax regulations'.[534] ATCO has quoted Australian Taxation Office (**ATO**) Ruling TR2013/4 in its justification. Following ATCO's response to an Authority question on asset lives, the Authority notes that TR2013/4 is no longer a current ATO Ruling and was replaced with TR2014/4 on 1 July 2014.

1085. The Authority notes that for the sections of TR2014/4 that are relevant to ATCO's assets there were no changes to either the asset categories or the effective asset lives between the two rulings.

1086. Table 56 lists ATCO's proposed asset lives for the TAB by asset class, and compares them to the following:

- Tax asset lives allowable under ATO Ruling TR2014/4 and the Income Tax Assessment Act (**ITAA**) 1997.
- Regulatory asset lives in the RAB.

[534] ATCO Gas Australia, *Email response to ERA6*, 19 June 2014.

Table 56 ATCO Proposed Tax Asset Lives and ATO Tax Asset Lives

Asset Category	ATCO Proposed Asset Life for TAB	Asset Life as per ATO Ruling or ITAA1997[535]	ATCO Proposed Asset Life for RAB
High pressure mains - steel	20	20	80
High pressure mains - PE	20	20	60
Medium pressure mains	20	20	60
Medium/low pressure mains	20	20	60
Low pressure mains	20	20	60
Regulators	40	40	40
Secondary gas stations	40	40	40
Buildings	**100**	**100** **33.3** **35**	**40**
Meter and service pipes	15	15	25
Equipment and vehicles	**20**	**8-15**	**10**
Vehicles	**20**	**8-15**	**5**
Information Technology	4	4	5
Full retail contestability	**20**	**N/A**	**5**

Source: ATCO Gas Australia, Access Arrangement Information, Table 80. ATCO Gas Australia, Tariff Model, September 2014. Australian Taxation Office, Ruling 2014/4. Income Tax Assessment Act 1997 – Section 40.102. ATCO Gas Australia, Email response to ERA6, 19 June 2014.

1087. ATCO has confirmed that its asset life assumptions for meters purchased before January 2008 which have a tax life of 25 years, full retail contestability, vehicles and equipment and vehicles 'could be out of line with current income tax regulations'.[536]

1088. For meters purchased before January 2008, the Authority accepts ATCO's explanation that there is no requirement to retrospectively apply an updated tax asset life for meters purchased before January 2008. As a result, these meters will be depreciated over a life of 25 years.

1089. For full retail contestability, the asset class cannot be directly matched to an asset class in the taxation legislation or in the ATO's taxation ruling. ATCO provided further information that the category of full retail contestability predominately consisted of IT assets.[537] As a result, the Authority has determined that the effective asset life for full retail contestability for the TAB should be 4 years. Revising the tax asset life to 4 years will result in the asset being fully depreciated by the end of 2008 and require an adjustment to be made to the opening tax base as at 1 July 2014.

1090. The two remaining asset classes that ATCO has stated have lives that are inconsistent with relevant taxation legislation are equipment and vehicles and vehicles. ATCO has provided information that vehicles included in the equipment and vehicles category

535 ATO Taxation Ruling TR 2014/4, 1 July 2014, and *Income Tax Assessment Act 1997*, Section 40.102.

536 ATCO Gas Australia, *Email response to ERA6*, 19 June 2014.

537 ATCO Gas Australia, *Email response to ERA6*, 19 June 2014.

relate to when ATCO leased vehicles and that the vehicles in the asset category vehicles relate to vehicles purchased by ATCO as part of their new approach to fleet management. In ATCO's access arrangement information document, ATCO indicates that vehicles have a 5 year replacement cycle. This is consistent with their RAB effective life.

1091. ATCO originally proposed TAB effective lives of 20 years for both equipment and vehicles and vehicles. In ATCO's email response to an Authority question (ERA6), ATCO provided some information regarding tax lives and the written down values for certain asset classes which revised the TAB effective lives to 14 years for equipment and vehicles and 13 years for vehicles. Based on available taxation legislation and ATO rulings for the different types of equipment and vehicles, the Authority has determined a TAB life for equipment and vehicles and vehicles to be 10 years.

1092. For buildings, ATCO has confirmed that the asset class includes depots, ATCO's Jandakot headquarters and other site structures, two blue flame kitchens and leasehold improvements.

1093. The Authority has also noted that ATCO has selected for buildings the longest asset life that is allowed by the ATO, and which corresponds to concrete buildings. Moreover, the Authority has compared ATCO's proposed tax asset life for buildings with tax asset lives used by other gas distribution networks in Australia in Table 57.

Table 57 Tax Asset Life for Buildings Used by Benchmark Gas Distribution Networks

Network	Building Asset Life for TAB
Envestra Victoria 2013-2017	40
Envestra Albury 2013-2017	40
SP AusNet 2013 - 2017	40
ATCO – Proposed 2014 - 2019	100

Source: ATCO Gas Australia, Access Arrangement Information, Table 80. Envestra Victoria, Access Arrangement Information, 1 January 2013 – 31 December 2017. Envestra Albury, Access Arrangement Information, 1 January 2013 – 31 December 2017. SP Ausnet, Access Arrangement Information, 1 January 2013 – 31 December 2017.

1094. As noted above ATCO has chosen an effective life of 100 years for the asset category of buildings. 100 years is an allowable asset life under TR2014/4 for Brick, stone or concrete structures, to the extent that they form an integral part of plant and machinery.

1095. As ATCO's asset category of buildings includes a combination of depots, the Jandakot head office and other site structures, the use of the maximum allowable 100 years appears excessive as it is unlikely that all structures included in the buildings category would form an integral part of plant and machinery.

1096. As a result of the above, the Authority has determined not to approve ATCO's proposal that the effective life for ATCO's assets category of buildings for the TAB is 100 years. The Authority requires ATCO to amend the effective life for ATCO's assets category of buildings from 100 years to 40 years. An effective life of 40 years for buildings makes ATCO's TAB and RAB effective lives consistent, is in line with industry benchmarking as evidenced above and complies with the NGL and NGR.

1097. The Ernst & Young consultant has noted:[538]

> I have not been advised of any specific reasons for the choice to use these longer self-assessed effective lives.

1098. Table 58 lists the asset lives that the Authority has determined to be appropriate for the TAB.

Table 58 Authority Determined Tax Asset Lives

Asset Category	ATCO Proposed Asset Life for TAB	Authority Determined Asset Life for TAB
High pressure mains - Steel	20	20
High pressure mains - PE	20	20
Medium pressure mains	20	20
Medium/low pressure mains	20	20
Low pressure mains	20	20
Regulators	40	40
Secondary gas stations	40	40
Buildings	**100**	**40**
Meter and service pipes to 31 December 2007	25	25
Meter and service pipes from 1 January 2008	15	15
Equipment and vehicles	**20**	**10**
Vehicles	**20**	**10**
Information Technology	4	4
Full retail contestability	**20**	**4**

Source: ATCO Gas Australia, Access Arrangement Information, Table 80. ATCO Gas Australia, Tariff Model, September 2014.

1099. The Authority notes that the following Authority decisions may further impact asset lives in the TAB:

- Exclusion of some of ATCO's proposed capital expenditure from conforming capital expenditure for the opening capital base and the projected capital base for the fourth access arrangement period.
- Exclusion of capital contributions from the TAB.
- Exclusion of depreciation of commercial meters from tax depreciation.

1100. The Authority requests that ATCO clarify any such impacts in its proposed response to this Draft Decision.

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538 Ernst & Young, *Review of regulated tax asset base for regulated revenue purposes – ATCO Gas Australia*, 18 December 2013.

Tax Depreciation Methodology

1101. In order to reflect ATO practice that assets may only be included in the tax asset register on an "as commissioned" basis, ATCO has assumed that assets are installed and are ready for use in the middle of each financial year. ATCO has thus started to apply tax depreciation in the same year as capital expenditure, but at half the amount for the first financial year.[539]

1102. The Authority considers that the rolled forward TAB should include commissioned assets only. The Authority recognises that there is a lag between spending capital expenditure and commissioning the relevant assets. Therefore, the Authority has updated ATCO's tax depreciation calculation by maintaining a one-year lag between spending capital expenditure and commissioning the relevant asset. The Authority requires that ATCO update the rolled forward TAB to ensure that the tax asset register includes commissioned assets only.

1103. ATCO has applied the straight line method to calculate tax depreciation. The Authority notes that diminishing value depreciation is an option under tax law.

1104. In implementing the NGR requirement to move to a post-tax model consistent with the requirements of rule 87A, the Authority considers that ATCO's tax liabilities going forward should align with the tax liabilities of a benchmark efficient entity. The Authority considers that a benchmark efficient entity would seek to minimize its tax liabilities. Accordingly, the Authority has decided to require ATCO to apply the diminishing value method to calculate tax depreciation for capital expenditure over the fourth access arrangement period.

1105. The Authority has therefore applied the diminishing value method to calculate tax depreciation for capital expenditure incurred over the fourth access arrangement period. The Authority has noted that if ATCO adopts diminishing value depreciation for capital expenditure incurred over the fourth access arrangement period, then ATCO would incur higher tax depreciation. This would lead to lower income tax payments.[540] This outcome is in line with the Authority's expected outcome for a benchmark efficient entity.

Debt Servicing Costs

1106. The Authority has amended ATCO's forecast debt servicing costs to reflect its revised decision on the opening RAB, and revised cost of debt risk margin and nominal risk free rate as noted in the Rate of Return chapter of this Draft Decision.

1107. The Authority also notes that ATCO has used a capital base value which is written down using the historic cost depreciation method, for the purposes of determining the debt servicing costs used as the interest shield in the tax calculations. The broad effect of this approach is to reduce the RAB and the corresponding debt servicing cost, reduce the interest tax shield, increase taxable profit, and thus increase the tax cash flow that is recompensed in the building block model.

1108. This depreciation method is not consistent with the current cost accounting (**CCA**) depreciation approach used to determine the RAB for other purposes in the building block approach, as discussed in the Depreciation chapter of this Draft Decision. In

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539 ATCO Gas Australia, *Tariff Model*, September 2014.

540 ERA, *GDS Tariff Model*, September 2014.

particular, this debt shield approach is not consistent with the RAB used for the purposes of determining the revenue, through the application of the WACC or the allowance for deprecation. The latter calculation correctly uses the CCA depreciation method for determining the RAB.

1109. The Authority considers that the two approaches should be consistent, otherwise the taxation cash flows will not be correct or consistent with the approach used to determine revenue.

1110. The Authority therefore requires that ATCO use the RAB derived using the CCA depreciation method for determining the debt service costs used in the taxation calculations.

Authority Approved Estimated Cost of Corporate Income Tax

1111. The Authority has updated ATCO's estimated cost of corporate income tax based on the above decisions. Moreover, the Authority has based ATCO's taxable income on smoothed tariff revenue, as being the closest estimate to actual accounting revenue that tax would be based on.[541]

1112. Table 59 shows the Authority's estimated cost of corporate income tax for the fourth access arrangement period.

Table 59 Authority Approved Estimated Cost of Corporate Income Tax (AA4)

Real $ million at June 2014	July to Dec 2014	2015	2016	2017	2018	2019	Total
Estimated Cost of Corporate Income Tax	8.04	-	-	-	-	-	8.04
Value of Imputation Credits	(4.02)	-	-	-	-	-	(4.02)
Authority Approved Estimated Cost of Corporate Income Tax Net of Imputation Credits	**4.02**	**-**	**-**	**-**	**-**	**-**	**4.02**

Source: ERA, GDS Tariff Model, October 2014.

1113. The Authority has calculated taxable income as assessable income less tax deductible costs that are recognised by the ATO, as follows:[542]

- Smoothed tariff revenue
- *plus* Revenues from prudent discounts.
- *plus* Ancillary service revenues.
- *minus* Approved forecast operating expenditure.
- *minus* Depreciation of the TAB, which excludes capital contributions, and depreciation of customer contributed commercial meter sets. The Authority has applied accelerated depreciation on assets acquired from the beginning of the access arrangement period.

541 Authority notes that AER bases taxable income on the net cost of service, as does ATCO's proposal.

542 ATCO Gas Australia, *Tariff Model*, September 2014.

- *minus* Debt servicing costs, which the Authority has calculated by multiplying the debt portion of the opening RAB by the debt to equity ratio (assumed at 60 per cent) and the Authority's nominal cost of debt (cost of debt risk margin plus nominal risk free rate) based on the Rate of Return chapter of this Draft Decision.
- *equals* Estimated taxable income.[543]

1114. The Authority has also updated ATCO's closing TAB for the fourth access arrangement period as follows:

- Updated initial capital base to exclude commercial meters.
- Updated opening tax asset base to exclude capital contributions.
- Updated forecast capital expenditure based on this Draft Decision.
- Updated tax depreciation by excluding depreciation of commercial meters, revising tax asset lives and depreciation methodology.

1115. The Authority notes that ATCO's TAB is smaller than ATCO's RAB. The main driver for this is that the TAB depreciates faster than the RAB, as tax asset lives are generally shorter than regulatory asset lives.

1116. Table 60 lists the Authority's estimated closing tax asset base by year over the fourth access arrangement period.

Table 60 Authority Approved Estimated Closing Tax Asset Base (AA4)

$ million nominal	July to Dec 2014	2015	2016	2017	2018	2019
Opening Tax Asset Base	477.37	482.98	502.77	500.79	495.12	492.47
Authority Forecast Capital Expenditure	28.37	70.24	55.56	52.16	52.62	47.41
Authority Forecast Depreciation	22.76	50.46	57.55	57.82	55.28	57.44
Authority Approved Estimated Closing Tax Asset Base	**482.98**	**502.77**	**500.79**	**495.12**	**492.47**	**482.44**

Source: ERA, GDS Tariff Model, October 2014.

1117. The Authority notes that the estimated cost of corporate income tax is zero from 2015 to 2019 as a result of the following:

- Significantly higher tax depreciation than regulatory depreciation, as a result of the tax asset lives being shorter than regulatory asset lives; and
- Debt servicing costs, which the Authority has applied on the real Regulatory Asset Base.[544]

1118. Table 61 breaks down the calculation of the Authority approved estimated cost of corporate income tax.

543 ATCO also accounts for carried forward tax losses in this calculation.

544 Under the PTRM model, AER applies the interest expense on the nominal Regulatory Asset Base. The Authority is concerned that AER's approach double counts for inflation.

Table 61: Authority Approved Calculation of Estimated Cost of Corporate Income Tax (AA4)

Nominal $ million	July to Dec 2014	2015	2016	2017	2018	2019	Total
Revenue							
Tariff Revenue (smoothed)	96.95	133.67	139.65	144.96	150.21	155.64	821.09
Prudent Discount Revenue	0.68	1.35	0.84	0.56	0.62	0.68	4.73
Ancillary Service Revenue	0.34	0.65	0.71	0.75	0.78	0.82	4.05
Total - Revenue	97.97	135.67	141.20	146.27	151.61	157.14	829.87
Expenses							
Operating Expenditure	32.26	64.46	66.16	67.77	70.48	72.43	373.56
Debt Servicing Costs	16.03	33.43	35.17	36.48	37.59	38.62	197.31
Tax Depreciation	22.76	50.46	57.55	57.82	55.28	57.44	301.29
Total - Expenses	70.87	147.59	158.08	161.25	162.51	167.63	867.92
Tax							
Net Income	27.11	(11.91)	(16.88)	(14.98)	(10.89)	(10.48)	
Taxable Income (including any tax loss carried forward)	27.11	(11.91)	(28.79)	(43.78)	(54.67)	(65.16)	
Estimated Cost of Corporate Income Tax	8.13	-	-	-	-	-	8.13
Value of Imputation Credits	(4.07)	-	-	-	-	-	(4.07)
Authority Approved Estimated Cost of Corporate Income Tax Net of Imputation Credits	**4.07**	**-**	**-**	**-**	**-**	**-**	**4.07**

Source: ERA, GDS Tariff Model, October 2014.

1119. The Authority notes that even if the Authority's estimated cost of income tax for ATCO in line with a benchmark efficient entity is zero for 2015 to 2019, the building block methodology guarantees ATCO a positive return on equity for these years.

Required Amendment 12.

The Authority requires that ATCO update the calculation of the estimated cost of income tax as per Table 59.

The Authority also requires that ATCO revise the TAB as per Table 60, to implement the following:

- Exclude capital contributions from the calculation.
- Exclude commercial meters from the calculation.
- Base taxable income on smoothed tariff revenue.
- Use the nominal (indexed) opening RAB derived using the current cost accounting depreciation method for determining the debt service costs used in the taxation calculations.

The Authority requires that ATCO:

- Update asset lives for the TAB as per Table 58.
- Update the rolled forward TAB to ensure that it includes commissioned assets only.
- Apply the diminishing value method to calculate tax depreciation for capital expenditure over the fourth access arrangement period.
- Update the cost of debt risk margin and nominal risk free margin for the calculation of debt servicing costs.

Return on Working Capital

Regulatory Requirements

1120. The NGL (WA) and NGR do not make specific reference to the cost of working capital used by a service provider.

1121. Rule 76 of the NGR provides that total revenue is to be determined for each regulatory year of the access arrangement period using the building block approach. The cost of working capital is not specifically included as a building block.

ATCO's Proposed Changes

1122. ATCO proposes to include a return on working capital of $1.26 million in nominal dollars over the course of the fourth access arrangement period, as part of the total revenue building blocks shown in Table 79 of the access arrangement information and reproduced below as Table 62.[545] The current access arrangement does not allow for a return on working capital.[546]

Table 62 ATCO's Proposed Return on Working Capital (AA4)

Nominal $ million	July to Dec 2014	2015	2016	2017	2018	2019
Prior Year Tariff Revenue	84.27	181.49	188.71	202.82	218.42	234.86
Expenses						
Forecast Capital Expenditure	45.87	108.40	119.81	124.97	127.43	132.73
Forecast Operating Expenditure	36.88	77.03	79.83	83.60	87.98	91.89
Total Expenses	82.74	185.43	199.64	208.56	215.41	224.62
Working Capital Requirement						
Receivables (18 days)	4.16	8.95	9.31	10.00	10.77	11.58
Payables (15 days)	(3.40)	(7.62)	(8.20)	(8.57)	(8.85)	(9.23)
Inventory (0.89% of capital expenditure)	0.41	0.96	1.07	1.11	1.13	1.18
Working Capital Requirement	1.16	2.29	2.17	2.54	3.05	3.53
Return on Working Capital at WACC = 8.53%[547]	0.10	0.20	0.19	0.22	0.26	0.30

Source: ATCO Gas Australia, Tariff Model, September 2014.

1123. ATCO states that working capital is a stock of funds a business must maintain to pay costs as they fall due.[548] A cost arises as a result of the misalignment (on average)

545 Real $ million at 30 June 2014.

546 Economic Regulation Authority, Final Decision on WA Gas Networks Pty Ltd proposed revised access arrangement for the Mid-West and South-West Gas Distributions System, 28 February 2011, p. 107.

547 Total return on working capital in Table 67 does not equal $1.26 due to rounding.

548 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 264.

between incurring the costs of providing services and recovering the revenues associated with the provision of those services.[549] The return on working capital thus reflects the cost of maintaining these funds.

1124. ATCO states that it has estimated its working capital amount using the "working capital cycle model as previously accepted by the ERA for Western Power".[550] ATCO's working capital cycle is made up of three core components:

- Inventory
- Accounts payable (creditor payments)
- Accounts receivables (debtor collection)

1125. ATCO's proposed inventory component is 0.89 per cent. ATCO states that this is determined from the average level of inventory as a percentage of the forecast capital expenditure program for the fourth access arrangement period.[551] ATCO has applied this percentage to forecast capital expenditure.

1126. ATCO's proposed accounts payable (creditor payment) days is 15 days. ATCO states that this is determined from the standard terms of payment with its suppliers.[552] ATCO has applied these payment terms to forecast operating and capital expenditure.

1127. ATCO's proposed accounts receivable days is 18 days. ATCO states that this is determined from its meter reading cycles and payment terms in its contracts.[553] ATCO has used the revenue from the year prior to calculate its receivable requirement.

Submissions

1128. None of the submissions made to the Authority on the proposed revisions to the access arrangement address the provision for a return on working capital.

Considerations of the Authority

1129. Besides the access arrangement information, the Authority does not have any other information available to it when considering whether to approve ATCO's proposal for a working capital amount. The Authority has not received any submissions on ATCO's working capital proposal. The Authority notes that it has previously adopted the working capital cycle model proposed by ATCO in its Western Power Final Decision.[554] However, the information provided in ATCO's proposed revised access arrangement submission alone is not sufficient to verify ATCO's claims that a return on working capital is necessary. As stated in paragraph 1123, the requirement for working capital arises due to the misalignment in timing between the receipt of income and the payment of expenses. Accordingly, the Authority has further examined the

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549 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 264.

550 Ibid.

551 Ibid.

552 Ibid.

553 Ibid.

554 Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network*, 5 September 2012, p. 260.

calculations performed by ATCO for its working capital cycle model, in order to verify its claims that a return on working capital is required.

1130. The Authority has sought further clarification from ATCO as to how it produced the components in paragraphs 1125, 1126 and 1127, specifically the inputs used to calculate the inventory as a percentage of capital expenditure, creditors and receivables as per Table 83 in ATCO's access arrangement information.[555]

1131. ATCO has provided the Authority with further information stating that its forecast for inventory as a percentage of capital expenditure was calculated by taking the average of monthly inventory levels from its general ledger for the years of 2011, 2012 and 2013. These were then divided by actual capital expenditure in each year to determine an inventory as a percentage of capital expenditure figure for each year. The three percentages were then averaged to produce an inventory as a percentage of capital expenditure figure of 0.89 per cent.[556]

1132. For creditor payment days, ATCO states that it has taken creditor balances from its general ledger for the 12 month period beginning November 2012 to October 2013 and calculated an average monthly creditor balance. This was then divided by the average of capital expenditure and operating expenditure (excluding UAFG) over the same period to produce the creditor payment days figure of 15 days.[557]

1133. For receivable days, ATCO states that it has taken the receivables balances from its general ledger for the 12 month period beginning November 2012 to October 2013 and calculated an average monthly receivable balance. This was then divided by the total haulage revenue over the same period to produce a receivable days figure of 18 days.[558]

1134. The Authority considers that ATCO has adopted a reasonable methodology in producing its forecast return on working capital. However, as a result of various required amendments in this Draft Decision, ATCO will also be required to amend its return on working capital amount in Table 83 of the access arrangement information because of changes to the tariff revenue, forecast operating expenditure, forecast capital expenditure and the weighted average cost of capital as set out in Table 63. The Authority has also made an adjustment to remove the double counting of inflation, as a result of using nominal dollars multiplied by the nominal weighted average cost of capital.[559]

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555 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 264.

556 ATCO Gas Australia, *Email response to ERA46 and ERA47*, 11 August 2014.

557 Ibid.

558 Ibid.

559 Nominal dollars and the nominal weighted average cost of capital both factor in the presence of inflation. Without making an adjustment to remove the double counting of inflation in both figures, ATCO's return on working capital amount would be overstated and incorrect.

Table 63 Authority Approved Return on Working Capital (AA4)

Nominal $ million	July to Dec 2014	2015	2016	2017	2018	2019
Tariff Revenue	96.95	133.67	139.64	144.96	150.21	155.64
Expenses						
Forecast Capital Expenditure	32.26	64.46	66.16	67.77	70.48	72.43
Forecast Operating Expenditure	28.37	70.24	55.56	52.16	52.62	47.41
Total Expenses	60.63	134.70	121.72	119.93	123.10	119.84
Working Capital Requirement						
Receivables (18 days)	9.48	6.59	6.87	7.15	7.41	7.68
Payables (15 days)	(4.94)	(5.54)	(4.99)	(4.93)	(5.06)	(4.92)
Inventory (0.89% of capital expenditure)	0.25	0.63	0.49	0.46	0.47	0.42
Working Capital Requirement	4.79	1.68	2.37	2.68	2.82	3.17
Return on Working Capital at WACC = 5.94%	0.14	0.10	0.14	0.16	0.17	0.19
Inflationary gain	(0.05)	(0.04)	(0.06)	(0.06)	(0.07)	(0.07)
Return on Working Capital	**0.09**	**0.06**	**0.09**	**0.10**	**0.10**	**0.11**

Source: ERA, GDS Tariff Model, October 2014.

Required Amendment 13.

The value of return on working capital for the fourth access arrangement must be amended to reflect the values shown in Table 63 of this Draft Decision.

Allocation of Total Revenue between Reference Services and Other Services

Regulatory Requirements

1135. Rule 93 of the NGR requires that total revenue is allocated between reference services and other services on the basis of an allocation of costs. As an alternative to cost allocation, rule 93 provides for services other than reference services to be classed as rebateable services, with part of the revenue from sale of these services to be rebated or refunded to users of reference services.

> 93 Allocation of total revenue and costs
>
> 1) Total revenue is to be allocated between reference and other services in the ratio in which costs are allocated between reference and other services.
>
> 2) Costs are to be allocated between reference and other services as follows:
>
> a) costs directly attributable to reference services are to be allocated to those services; and
>
> b) costs directly attributable to pipeline services that are not reference services are to be allocated to those services; and
>
> c) other costs are to be allocated between reference and other services on a basis (which must be consistent with the revenue and pricing principles) determined or approved by the [Authority].
>
> 3) The [Authority] may, however, permit the allocation of the costs of rebateable services, in whole or part, to reference services if:
>
> a) the [Authority] is satisfied that the service provider will apply an appropriate portion of the revenue generated from the sale of rebateable services to provide price rebates (or refunds) to the users of reference services; and
>
> b) any other conditions determined by the [Authority] are satisfied.
>
> 4) A pipeline service is a rebateable service if:
>
> a) the service is not a reference service; and
>
> b) substantial uncertainty exists concerning the extent of the demand for the service or of the revenue to be generated from the service; and
>
> c) the market for the service is substantially different from the market for any reference service.

ATCO's Proposed Changes

1136. In order to determine the total revenue that is to be recovered from reference haulage service tariffs, ATCO has subtracted the Net Present Value (**NPV**) of ancillary service revenue and the NPV of prudent discount revenue from the NPV of total revenue derived through the building block methodology. ATCO has then solved for price paths that align the NPV of total revenue with the NPV of forecast tariff revenues.

1137. ATCO has proposed to continue offering the same ancillary services in the fourth access arrangement period as the third access arrangement period. Ancillary services cover the following services: applying a meter lock, removing a meter lock, deregistering a delivery point, disconnecting a delivery point, and reconnecting a delivery point.

1138. ATCO has proposed to calculate ancillary service tariffs on a cost recovery basis. Table 64 provides ATCO's proposed forecast ancillary service revenues for the fourth access arrangement period.

Table 64 ATCO's Proposed Ancillary Service Revenues (AA4)

Nominal $ millions	July-Dec 2014[560]	2015	2016	2017	2018	2019
ATCO's Proposed Ancillary Service Revenues (AA4)	0.43	0.65	0.72	0.76	0.80	0.85

Source: ATCO Gas Australia, Tariff Model, September 2014.

1139. ATCO initially estimated forecast revenues from customers that receive prudent discounts at $4.7 million over the fourth access arrangement period.[561] Upon the repeal of carbon tax legislation, ATCO updated its proposed forecast revenues from customers that receive prudent discounts to account for lower customer tariffs as a result of the removal of the carbon tax.

1140. ATCO forecasts that the number of customers receiving prudent discounts will decrease from 14 to 11 during the fourth access arrangement period. ATCO also forecasts that no additional customers will receive prudent discounts over the fourth access arrangement period.[562]

1141. Table 65 shows ATCO's proposed revenues from customers that receive prudent discounts in the fourth access arrangement period.

Table 65 ATCO's Proposed Revenues from Customers that Receive Prudent Discounts (AA4)

Nominal $ millions	July-Dec 2014	2015	2016	2017	2018	2019
ATCO's Proposed Revenues from Customers that Receive Prudent Discounts (AA4)	0.68	1.35	0.84	0.56	0.62	0.68

1142. Source: ATCO Gas Australia, Tariff Model, September 2014.Table 66 shows the NPV of ATCO's proposed tariff revenues for the fourth access arrangement period, which ATCO derives by subtracting the NPV of ancillary service revenues and revenues from customers that receive prudent discounts from total revenues calculated through the cost of service.

560 The revenue for each ancillary service for Jul-Dec 2014 is calculated by multiplying the charging parameter with part of the annual activity volume.

561 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Table 90, p. 277.

562 ATCO has adjusted tariffs directly for the carbon tax repeal, without updating the prudent discount numbers to reflect that tariffs will be adjusted through prudent discounts.

Table 66 ATCO's Proposed Tariff Revenues (AA4)

Nominal $ millions	NPV
ATCO's Proposed Total Revenues	919.63
ATCO's Proposed Ancillary Service Revenues (AA4)	3.81
ATCO's Proposed Revenues from Customers that Receive Prudent Discounts (AA4)	3.24
ATCO's Proposed Haulage Tariff Revenues	912.58

Source: ATCO Gas Australia, Tariff Model, September 2014.

Submissions

1143. The Authority has not received any submissions in relation to ATCO's allocation of total revenue between reference services and other services in the proposed revised access arrangement.

Considerations of the Authority

1144. The Authority has also determined the total revenue that is to be recovered from reference haulage service tariffs by subtracting the NPV of ancillary service revenue and the NPV of prudent discount revenue from the NPV of total revenue derived through the building block methodology.

1145. The Authority has computed a different total revenue figure to that proposed by ATCO due to the Authority's required adjustments to the revenue building block components, which have been explained in previous chapters of this Draft Decision. As per the Ancillary Service tariff chapter of this Draft Decision, the Authority has also adjusted ancillary service revenues.

1146. The Authority has adjusted tariffs in 2015, and has kept them constant in real terms from 2015 to 2019 such that the present value of the total revenue is identical to the net cost of service. For the B3 standing charge, the Authority has applied a separate adjustment to increase it gradually from 2015 to the avoidable cost recovery level in 2019.

1147. Table 67 shows the NPV of the Authority approved tariff revenues for the fourth access arrangement period, derived by subtracting the NPV of ancillary service revenues and revenues from customers that receive prudent discounts from total revenues calculated through the cost of service.

Table 67 Authority Approved Tariff Revenues (AA4)

Nominal $ millions	NPV
Authority Approved Total Revenues	692.69
Authority Approved Ancillary Service Revenues (AA4)	4.06
Authority Approved Revenues from Customers that Receive Prudent Discounts (AA4)	3.35
Authority Approved Haulage Tariff Revenues	685.28

Source: ERA, GDS Tariff Model, October 2014.

Required Amendment 14.

The value of tariff revenues to be allocated for the calculation of haulage tariffs for the fourth access arrangement period must be amended to reflect Table 67 of this Draft Decision.

Reference Tariffs

Haulage Tariffs

Regulatory Requirements

1148. Rule 92 of the NGR discusses the equalisation of revenues from charged tariffs with calculated tariff revenue.

> 92. Revenue Equalisation
>
> 2) The reference tariff variation mechanism must be designed to equalise (in terms of present values):
>
> a) forecast revenue from reference services over the access arrangement period; and
>
> b) the portion of total revenue allocated to reference services for the access arrangement period.

1149. Rule 94 of the NGR sets out the requirements for the determination of reference tariffs for distribution pipelines.

> 94. Tariffs – distribution pipelines
>
> 1) For the purpose of determining reference tariffs, customers for reference services provided by means of a distribution pipeline must be divided into tariff classes.
>
> 2) A tariff class must be constituted with regard to:
>
> a) the need to group customers for reference services together on an economically efficient basis; and
>
> b) the need to avoid unnecessary transaction costs.
>
> 3) For each tariff class, the revenue expected to be recovered should lie on or between:
>
> a) an upper bound representing the stand alone cost of providing the reference service to customers who belong to that class; and

b) a lower bound representing the avoidable cost of not providing the reference service to those customers.

4) A tariff, and if it consists of 2 or more charging parameters, each charging parameter for a tariff class:

a) must take into account the long run marginal cost for the reference service or, in the case of a charging parameter, for the element of the service to which the charging parameter relates;

b) must be determined having regard to:

i) transaction costs associated with the tariff or each charging parameter; and

ii) whether customers belonging to the relevant tariff class are able or likely to respond to price signals.

5) If, however, as a result of the operation of subrule (4), the service provider may not recover the expected revenue, the tariffs must be adjusted to ensure recovery of expected revenue with minimum distortion to efficient patterns of consumption.

6) The [Authority's] discretion under this rule is limited.

1150. Rule 96 of the NGR covers provisions for prudent discounts.

96. Prudent discounts

1) Despite the other provisions of this Division, the [Authority] may, on application by a service provider, approve a discount for a particular user or prospective user or a particular class of users or prospective users.

2) The [Authority] may only approve a discount under this rule if satisfied that:

a) the discount is necessary to:

i) respond to competition from other providers of pipeline services or other sources of energy; or

ii) maintain efficient use of the pipeline; and

b) the provision of the discount is likely to lead to reference or equivalent tariffs lower than they would otherwise have been.

Note:

Even though a user's incremental load is retained at a discounted price, overall tariffs may be lower because of the user's contribution to fixed costs.

3) If the [Authority] approves a discount under this rule, the [Authority] may also approve allocation of the cost, or part of the cost, of providing the discount to the costs of providing a reference or other service in one or more future access arrangement periods.

4) In this rule:

equivalent tariff means the tariff that is likely to have been set for a service that is not a reference service if the service had been a reference service.

ATCO's Proposed Changes

Tariff classes

1151. ATCO has proposed that the existing tariff classes continue into the fourth access arrangement period with the same charging parameters.

1152. ATCO's tariff classes are as follows:

- Tariff Class A1 – approximately 70 customers that require in excess of 35 TJ/year supplied at high or medium pressures, a contracted peak rate of 10 GJ or more per hour and user specific delivery facilities.
- Tariff Class A2 – approximately 110 customers that require volumes of gas in excess of 10 TJ/year but less than 35 TJ/year supplied at high or medium pressures, a contracted peak rate of less than 10 GJ/hour or above 10 TJ/hour and user specific delivery facilities.
- Tariff Class B1 – approximately 1,400 customers that require volumes of gas that do not exceed 10 TJ/year supplied at high or medium pressures, a contracted peak rate of less than 10 GJ/hour, and possibly user specific delivery facilities.
- Tariff Class B2 – approximately 10,000 large residential and small industrial customers that can be supplied from the medium and low pressure parts of the GDS. These small use customers can be supplied using up to 20 metres of service pipe, a standard pressure regulator and a standard 12m^3/hour meter.
- Tariff Class B3 – more than 670,000 residential and small industrial customers that can be supplied from the medium and low pressure parts of the GDS. These customers use less than 20 metres of service pipe. Currently these customers utilize a standard 8m^3/hour meter (AL8). ATCO proposes to include a larger 10m^3/hour meter in the standard delivery facilities for these customers in the fourth access arrangement period.

1153. ATCO states that the five tariff classes achieve a balance between grouping customers together on an economically efficient basis, and avoiding unnecessary transaction costs associated with a multitude of tariff classes.[563]

Reference tariff charging parameters

1154. ATCO does not propose to change the charging parameters for reference tariffs in the fourth access arrangement period. ATCO proposes to present usage charges for A2, B1, B2 and B3 customers per day rather than per year.

1155. Table 68 shows ATCO's charging parameters for reference tariffs for the fourth access arrangement period.

[563] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 271.

Table 68 Reference Tariff Charging Parameters (AA4)

Tariff Class	Service Element	Charging Parameter
A1	Fixed charge for using the distribution system	Standing Charge ($/year)
	Fixed charge for the network capacity utilized	Demand Charge ($/MHQ GJ/km)
	Variable charge based on throughput	Usage Charge ($/GJ/km)
	Charge to reflect specific costs associated with customer for service pipe, regulators, metering and telemetry	User Specific Charge ($)
A2	Fixed charge for using the distribution system	Standing Charge ($/year)
	Variable charge based on throughput	Usage Charge ($/GJ/day)
	Charge to reflect specific costs associated with customer for service pipe, regulators, metering and telemetry	User Specific Charge ($)
B1	Fixed charge for using the distribution system	Standing Charge ($/year)
	Variable charge based on throughput	Usage Charge ($/GJ/day)
	Charge to reflect specific costs associated with customer for service pipe, regulators, metering and telemetry	User Specific Charge ($)
B2	Fixed charge for using the distribution system	Standing Charge ($/year)
	Variable charge based on throughput	Usage Charge ($/GJ/day)
B3	Fixed charge for using the distribution system	Standing Charge ($/year)
	Variable charge based on throughput	Usage Charge ($/GJ/day)

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Table 89, p. 273.

Adjustments to the standing charges for B3 reference tariff customers

1156. ATCO proposes to increase the standing charge parameter associated with B3 reference tariff customers. ATCO has also included 2 GJ of gas consumption in the standing charge. ATCO proposes to offset the increase in the standing charge with a decrease in the usage charge to retain the proportion of revenue to be recovered from B3 customers.

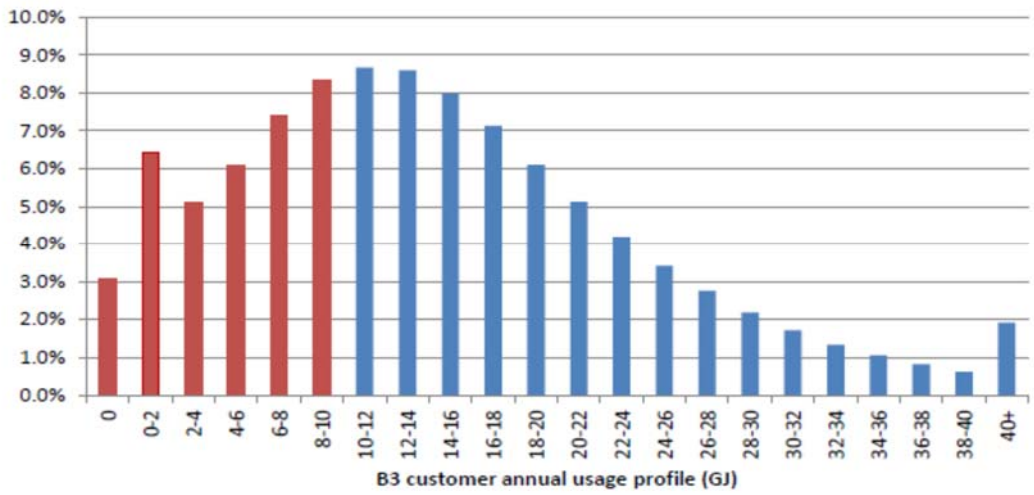
1157. ATCO has made the changes to ensure that the avoidable costs of connecting every B3 customer is recovered, and provide efficient price signals to new customers. ATCO has calculated the avoidable costs of connecting B3 customers as the net present value of the costs of a standard meter, standard regulator and average length of service pipe.

1158. ATCO has provided the following analysis to demonstrate the impact that this change will have on B3 customers.[564]

1159. Figure 39 shows the percentage of B3 customers by annual consumption based on ATCO's consumption profile in 2013.

[564] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 275.

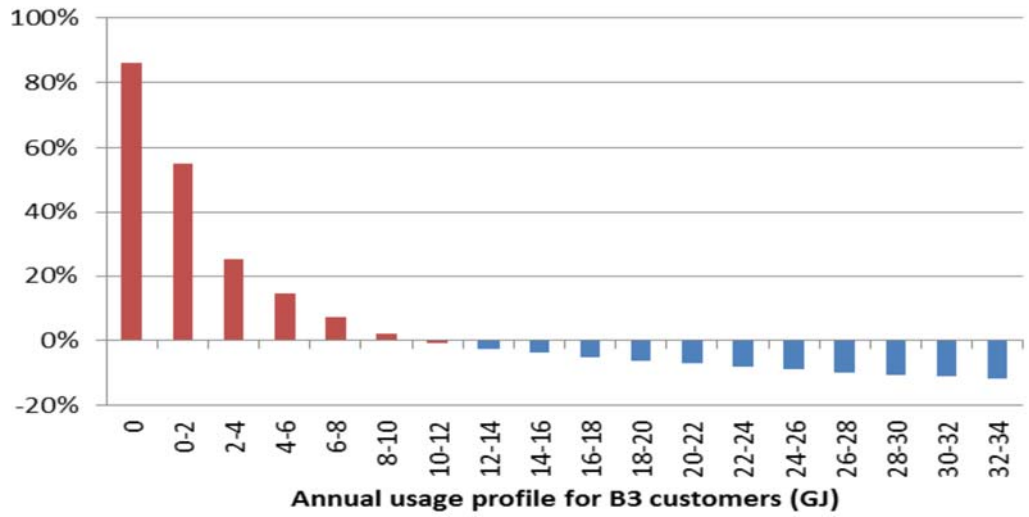
Figure 39 Distribution of Annual Consumption of B3 Customers in 2013



Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 87, p. 275.

1160. Figure 40 shows the price impact on a B3 customer moving to the proposed tariff in the fourth access arrangement period. The price impact ranges from increases of 86 per cent to decreases greater than 12 per cent.

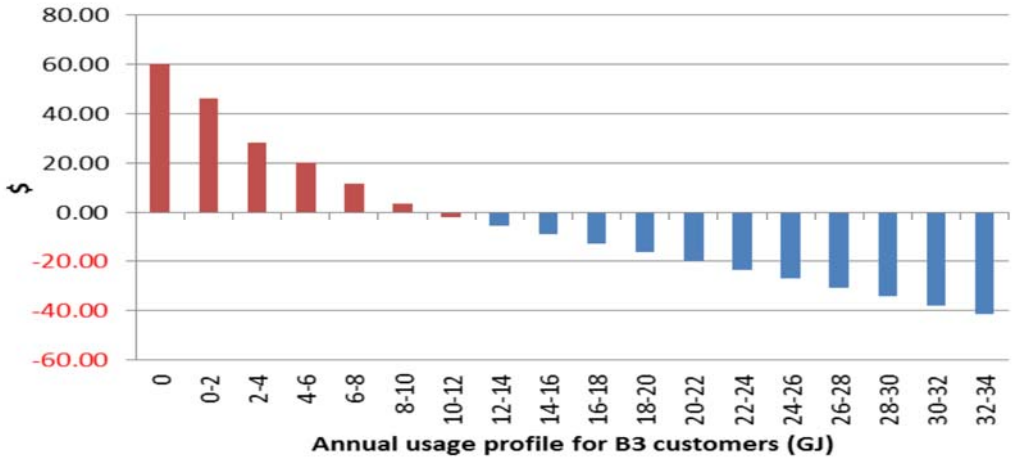
Figure 40 Price Impact on B3 Customers of ATCO's Proposed B3 Price Path (%)



Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 88, p. 275.

1161. Figure 41 illustrates the increase in the annual network charge to a B3 customer based on consumption. The largest annual network bill increase is $60, which is the difference between the current annual standing charge and the new annual standing charge.

Figure 41 Price Impact on B3 Customers of ATCO's Proposed B3 Price Path ($)



Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 89, p. 276.

Haulage tariffs

1162. ATCO has calculated its proposed reference tariffs for the fourth access arrangement period as follows:[565]

- Multiplied each charging parameter under each tariff class in the third access arrangement period by customer number and usage forecasts for each fourth access arrangement period tariff.
- Applied adjustments to the standing charge for B2[566] and B3 customers starting on 1 January 2015.
- Adjusted each charging parameter by the same amount until the revenue generated by the reference tariffs is equalised with the total revenue to be recovered from reference service customers.

1163. ATCO considers that this method complies with rule 92(2) of the NGR.

1164. As per rule 94 (3) of the NGR, ATCO has calculated the avoidable costs, standalone costs and expected revenue for each tariff class to confirm that expected revenue falls between avoidable costs and standalone costs.

1165. According to ATCO:

- the avoidable cost of providing a particular reference service is the cost that would not be incurred if the service were no longer provided;[567]
- the stand alone cost of providing a particular reference service is the cost that would be incurred by an efficient service provider entering the market for gas distribution services and providing only that reference service.[568]

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565 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Tables 90 and 92, pp. 281-282.

566 In the Access Arrangement Information, ATCO only discusses its proposal of increasing the standing charge for B3 customers.

567 ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Appendix 27, p. 1.

568 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 27, p. 3.

1166. ATCO has calculated avoidable costs for each tariff class by summing up avoidable operating expenditure (excluding UAFG), return on and depreciation of avoidable capital expenditure and avoidable UAFG, calculated as follows:[569]

- Avoidable operating expenditure (excluding UAFG) [570]: reviewed costs in each cost centre to identify costs that would not be incurred if the tariff class was no longer provided with the reference service, and summed up such costs for each tariff class.
- Return on and depreciation of avoidable capital expenditure[571]: identified avoidable capital projects for each tariff class, and proportion of avoidable capital expenditure for such projects by tariff class (expenditure on medium/low pressure mains), and calculated the return on and depreciation of this capital expenditure. ATCO has calculated return and depreciation using a methodology that is consistent with that used in the total revenue calculation. ATCO considered that forecast capital expenditure on high pressure mains was not avoidable, as it is required to provide new and replacement haulage capacity necessary to customers in all tariff classes.
- Avoidable UAFG[572]: reviewed number of customers and usage in each tariff class, accounted for measurement errors at gate stations and errors associated with interval meters, and corrected temperature for measurements made by non-interval meters.

1167. ATCO has calculated standalone costs for each tariff class by summing up standalone operating expenditure, and return on and depreciation of standalone capital expenditure, calculated as follows:

- Standalone operating expenditure: subtracted avoidable costs for each tariff class from total costs for the tariff class.
- Return on and depreciation of standalone capital expenditure: identified proportion of capital base at 30 June 2014 and forecast capital expenditure that is required to provide haulage services to each tariff class on a standalone basis, and calculated the return on and depreciation of this capital expenditure. ATCO has calculated return and depreciation using a methodology that is consistent with that used in the total revenue calculation – that is, a straight line depreciation over the stand alone asset lives, and return on the opening asset base at the rate of return.[573]

1168. Table 69 shows ATCO's estimated expected revenue, avoidable costs and standalone costs by tariff class over the fourth access arrangement period.

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569 ATCO Gas Australia, *Access Arrangement - Appendix 27*, 17 March 2014.

570 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 27, p. 1.

571 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 27, p. 2.

572 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 27, p. 1.

573 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Appendix 27, p. 4.

Table 69 ATCO's Estimated Expected Revenue, Avoidable Costs and Standalone Costs by Tariff Class (AA4)

Real $ million at 30 June 2014	A1	A2	B1	B2	B3
Expected Revenue (NPV)	42.35	38.17	51.24	53.65	727.17
Avoidable Cost	5.29	4.86	6.31	6.81	75.37
Standalone Cost	407.98	531.80	635.30	652.61	827.58

Source: ATCO, Tariff Model, September 2014

1169. ATCO expected that a final decision on the proposed revised access arrangement for the fourth access arrangement period would not be provided prior to the commencement of the access arrangement period on 1 July 2014. ATCO has calculated the reference tariffs based on the assumption that the tariffs will be effective from 1 January 2015.[574]

1170. Since submitting the proposed revised access arrangement on 17 March 2014, ATCO has submitted a revised tariff model on 1 September 2014. ATCO's tariff model contains the following updates:

- updated operating expenditure to account for updated IT operating expenditure and updated UAFG operating expenditure;
- updated return and depreciation to account for updated IT capital expenditure; and
- updated tariffs at 1 July 2014 to account for prudent discount adjustments as a result of the repeal of carbon tax legislation.

1171. ATCO's current reference tariffs and its proposed reference tariffs for haulage services A1, A2, B1, B2, and B3 are shown in Table 70.

[574] ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 281.

Table 70 ATCO's Current and Proposed Haulage Reference Tariffs (AA4)

Nominal $	Units	1-July-14	1-Jan-15	1-Jan-16	1-Jan-17	1-Jan-18	1-Jan-19
Reference tariff A1							
Standing charge	$/year	46,742.47	49,122.48	51,623.67	54,252.22	57,014.61	59,917.65
Demand charge							
First 10 km	$/GJ km	197.00	207.03	217.58	228.65	240.30	252.53
Distance > 10 km	$/GJ km	103.69	108.97	114.52	120.35	126.48	132.92
Usage charge							
First 10 km	$/GJ km	0.04180	0.04392	0.04616	0.04851	0.05098	0.05358
Distance > 10 km	$/GJ km	0.02088	0.02194	0.02306	0.02424	0.02547	0.02677
Reference tariff A2							
Standing charge	$/Year	25,879.11	27,196.81	28,581.60	30,036.91	31,566.31	33,173.59
First 10 TJ	$/GJ	2.50	2.63	2.76	2.90	3.05	3.20
Volume > 10 TJ	$/GJ	1.34	1.41	1.48	1.56	1.63	1.72
Reference tariff B1							
Standing charge	$/Year	1,303.65	1,370.03	1,439.79	1,513.10	1,590.14	1,671.11
First 5 TJ	$/GJ	4.98	5.23	5.50	5.78	6.07	6.38
Volume > 5 TJ	$/GJ	4.27	4.49	4.72	4.96	5.21	5.47
Reference tariff B2							
Standing charge	$/Year	326.67	349.71	367.52	386.23	405.90	426.57
First 100 GJ	$/GJ	8.31	8.66	9.10	9.56	10.05	10.56
Volume > 100 GJ	$/GJ	4.95	5.16	5.42	5.70	5.99	6.29
Reference tariff B3							
Standing charge	$/Year	70.98	134.83	141.70	148.91	156.50	164.46
First 2 GJ[575]	$/GJ	13.95	nil	nil	nil	nil	nil
Volume > 2 and <10 GJ	$/GJ	13.95	9.96	10.47	11.00	11.56	12.15
Volume > 10 GJ	$/GJ	6.02	4.30	4.52	4.75	4.99	5.24

Source: ATCO Gas Australia, Tariff Model, September 2014

Submissions

1172. Both Alinta and Kleenheat presented submissions to the Authority in relation to ATCO's proposed haulage tariffs. Both retailers considered that recovering a higher portion of the revenue requirement through fixed charges does not necessarily send more appropriate price signals to customers.[576] Kleenheat specifically notes that an increase to standing charges for B3 customers could be counterintuitive to promoting efficient growth. Alinta considers that price signals to customers would not be achieved

unless retailers obtain agreement from the Government to pass through tariff increases.[577] Kleenheat notes that the current regulated retail natural gas tariff structure may limit the effectiveness of price signals by ATCO to B3 customers.[578] Moreover, Alinta considers that low consumption residential customers will wear a disproportionate amount of cost in comparison with their overall usage. According to Alinta, costs should be apportioned across customers incrementally utilising the network, not through higher fixed costs.

1173. Further, Alinta elaborated that the impact of network price increases may be worn exclusively by retailers if there is misalignment between ATCO's new tariffs and the Government's retail tariff decision. This will be exacerbated in a competitive market where new entrant retailers are able to make offers to high use customers, leaving the incumbent to supply low use customers at below cost. On the other hand, Alinta considered that if retailers were able to pass through network cost increases to customers, ATCO's proposal to increase the standing charge for B3 customers would result in material price volatility worn by customers with low consumption (0-5GJ). These customers may choose to disconnect. Alinta considered that this would be contrary to ATCO's proposed marketing campaign, aimed at increased connections and consumption. Alinta also stated that if a customer disconnected without paying for the removal of the meter, the retailer would continue to pay ATCO the standing charges for the site.

Considerations of the Authority

1174. The Authority approves ATCO's proposal not to revise the tariff classes or tariff charging parameters from the third access arrangement period. The Authority notes that ATCO has adjusted the values in relation to tariff charging parameters to reflect daily rather than annual usage. The Authority understands that ATCO currently charges retailers based on daily consumption. Therefore, ATCO's adjustment ensures that the access arrangement aligns with current practice. The Authority accepts this adjustment.

1175. ATCO has proposed to increase the standing charge for B3 customers while decreasing usage charges by an equivalent amount, in order to reflect the avoidable capital costs of connecting a B3 customer. The Authority has reviewed ATCO's proposal to increase the standing charge for B3 customers in terms of the following:

- Proposal to reflect the avoidable capital costs of connecting a B3 customer in the standing charge.
- Proposed method to re-calculate the B3 standing charge.
- Price path towards the re-calculated B3 standing charge and usage charges.

1176. The Authority agrees with ATCO's proposal to reflect the avoidable capital costs of connecting a B3 customer in the standing charge. The Authority notes the views of Alinta and Kleenheat with respect to increasing fixed charges, however, in this case,

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575 The standing charge for B3 customers includes 2GJ of consumption from 2015 onwards.

576 Alinta Energy, Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement, 21 May 2014, p. 8. Kleenheat Gas, Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement, 21 May 2014, p. 2.

577 Alinta Energy, Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement, 21 May 2014, p. 8.

578 Kleenheat Gas, Submission on Proposed Revisions to the Mid-West and South-West Gas Distribution System Access Arrangement, 21 May 2014, p. 2.

the Authority considers that ATCO should be allowed to at least recover the avoidable capital costs of connecting a B3 customer. The Authority considers that this proposal would provide efficient price signals as follows:

- In the case that retailers pass on the standing charge increase to customers, customers would factor in the cost reflective charge in their decision to connect/stay connected to gas.
- In the case that retailers do not pass on the standing charge increase to customers, retailers would factor in the cost reflective charge in their decision whether or not to disconnect delivery points that are no longer current gas customers.

1177. The Authority notes that ATCO's proposal to reflect the avoidable capital costs of connecting a B3 customer in the standing charge reduces ATCO's risk of B3 customer revenue being lower than forecast. This is because ATCO would recover the bulk of the cost of the B3 customer connection through the standing charge, irrespective of how much gas the customer consumes.

1178. As noted above, ATCO has calculated the avoidable costs of a customer connection as the cost of a standard meter, standard regulator and average length of service pipe. ATCO has assumed an asset life for these three assets of 25 years. ATCO has re-calculated the B3 standing charge as the net present value of the avoidable costs using a discount factor that includes its inflation and WACC assumptions.

1179. The Authority has reconciled ATCO's assumed avoidable costs with the access arrangement information. However, the Authority has not benchmarked these costs. The Authority has decided to accept ATCO's assumed avoidable costs. Moreover, the Authority has confirmed that the 25-year asset life assumption is consistent with ATCO's RAB asset lives in the proposed revised access arrangement.

1180. The Authority has updated the discount factor (used to calculate a net present value) to re-calculate the B3 standing charge based on its approved inflation assumption and approved WACC as per the Rate of Return section of this Draft Decision. Therefore, the Authority has revised ATCO's re-calculated standing charge from $128.30 to $99.63.

1181. Under the *National Gas Access (WA) (Local Provisions) Regulations 2009*, the Authority is required to consider the impact on customers and retailers when determining the price path for small use customers. The Authority considers that the moving from the current B3 standing charge of $70.98 to $99.63 in one year will have a significant impact on small use customers and retailers. As a result, the Authority has decided to implement the increased standing charge gradually from 2015 to 2019.

1182. In order to ensure that B3 customers are not allocated an unfair share of revenue to be recovered as a result of the standing charge increase, the Authority has calculated B3 usage charges as follows:

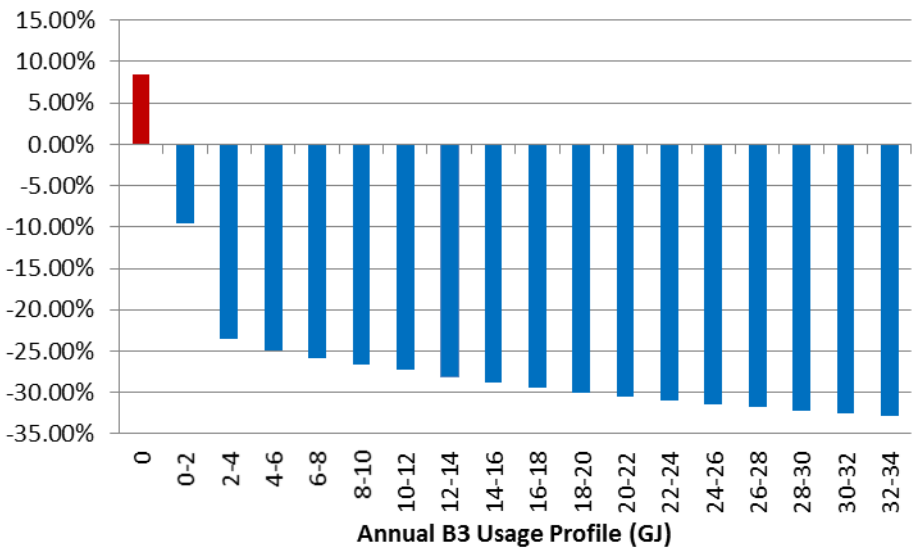
- For 2015:
  - Decrease usage charges by the full extent of the revenue adjustment of this Draft Decision.
  - Set the revenue allocation to the B3 tariff class in 2015 at the 2014 level of 80.9 per cent.[579]

[579] ATCO Gas Australia, *Tariff Model*, September 2014.

- For 2016-2019:
  - Set the bill of an average B3 user to remain constant in real terms, which covers standing and usage tariffs. Effectively, this indicates a further reduction in the average B3 usage tariffs to offset the increase in the standing charge in real terms.

1183. The Authority has evaluated the impact of its approved B3 standing and usage charge price path on B3 customers based on B3 customer profile data provided by ATCO. Figure 42 shows the expected network gas bill impact (in real terms) of the Authority's approved B3 tariff price path on B3 customers by usage bracket for 2015 only. As shown in Figure 42, only customers that do not use any gas will face a tariff increase in 2015 of around 8.42 per cent. For all other B3 customers, the usage tariff decrease will more than offset the standing charge increase.

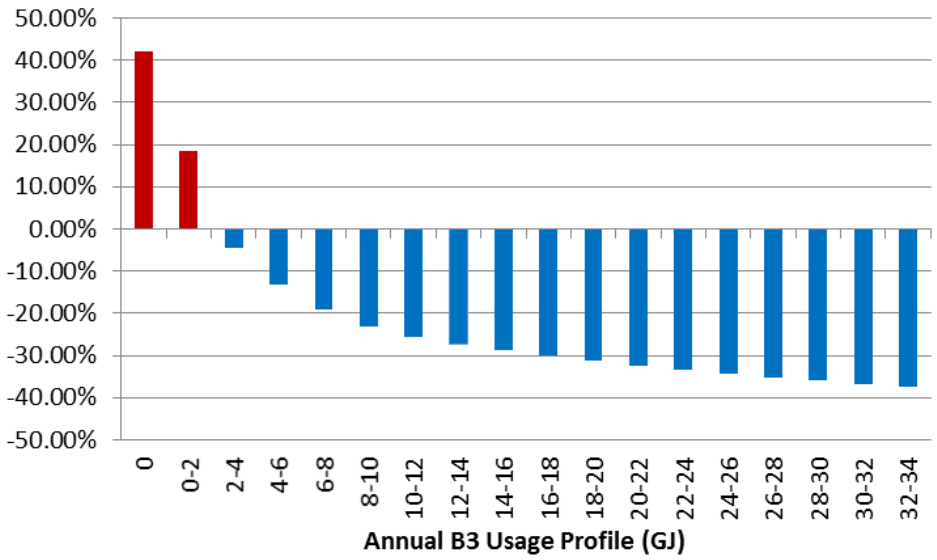
Figure 42 Price Impact (Real) on B3 Customers of the Authority Approved B3 Price Path, 2014-2015 (%)



Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Figure 88, p. 275. ERA, GDS Tariff Model, October 2014.

1184. Figure 43 shows the expected network gas bill impact (in real terms) of the Authority's approved B3 tariff price path on B3 customers by usage bracket for 2014-2019. As shown in Figure 43, only customers that use 0-2 GJ of gas will face a tariff increase (in real terms) over the fourth access arrangement period. For all other B3 customers, the usage tariff decrease will more than offset the standing charge increase.

Figure 43 Price Impact (Real) on B3 Customers of the Authority Approved B3 Price Path, 2014– 2019 (%)



1185. The Authority has updated GDS haulage tariffs based on updated total revenue, as per the Total Revenue section of this Draft Decision. The Authority has decided to implement the following price paths:[580]

- For A1, A2, B1 and B2 tariff classes:
  - Decrease haulage tariffs by the full extent of the revenue adjustment in 2015.
  - Fix haulage tariffs in real terms from 2015 till 2019.
- For B3 tariff class:
  - Increase standing charge gradually to $99.63 in real 30 June 2014 dollar terms by 2019.
  - Decrease usage charges by the full extent of the revenue adjustment in 2015.
  - Decrease usage charges in real terms from 2015 till 2019.

1186. The Authority has not been able to update ATCO's avoidable cost and standalone cost calculations to test whether the expected revenue by tariff class would still be between the two as per rule 94 of the NGR. The Authority requires ATCO to provide this calculation in response to this Draft Decision.

1187. The Authority's approved haulage reference tariffs for each tariff class are set out in nominal dollars in Table 71 and real dollars in Table 72.

580 The Authority has assumed that tariffs in the revised access arrangement will be passed on to customers.

Table 71 Authority Approved (Nominal) Haulage Reference Tariffs (AA4)

Nominal $	Units	1-July-14	1-Jan-15	1-Jan-16	1-Jan-17	1-Jan-18	1-Jan-19
Reference tariff A1							
Standing charge	$/year	46,742.47	32,701.06	33,433.56	34,182.47	34,948.16	35,731.00
Demand charge							
First 10 km	$/GJ km	197.00	137.82	140.91	144.07	147.29	150.59
Distance > 10 km	$/GJ km	103.69	72.54	74.17	75.83	77.53	79.26
Usage charge							
First 10 km	$/GJ km	0.04180	0.02924	0.02990	0.03057	0.03125	0.03195
Distance > 10 km	$/GJ km	0.02088	0.01461	0.01494	0.01527	0.01561	0.01596
Reference tariff A2							
Standing charge	$/Year	25,879.11	18,105.04	18,510.59	18,925.23	19,349.16	19,782.58
First 10 TJ	$/GJ	2.50	1.75	1.79	1.83	1.87	1.91
Volume > 10 TJ	$/GJ	1.34	0.94	0.96	0.98	1.00	1.02
Reference tariff B1							
Standing charge	$/Year	1,303.65	912.03	932.46	953.35	974.71	996.54
First 5 TJ	$/GJ	4.98	3.48	3.56	3.64	3.72	3.81
Volume > 5 TJ	$/GJ	4.27	2.99	3.05	3.12	3.19	3.26
Reference tariff B2							
Standing charge	$/Year	326.67	228.54	233.66	238.89	244.24	249.71
First 100 GJ	$/GJ	8.31	5.81	5.94	6.08	6.21	6.35
Volume > 100 GJ	$/GJ	4.95	3.46	3.54	3.62	3.70	3.78
Reference tariff B3							
Standing charge	$/Year	70.98	78.66	86.64	94.94	103.57	112.54
First 2 GJ[581]	$/GJ	13.95	nil	nil	nil	nil	nil
Volume > 2 and <10 GJ	$/GJ	13.95	10.01	9.60	9.17	8.71	8.23
Volume > 10 GJ	$/GJ	6.02	3.70	3.55	3.39	3.22	3.04

Source: ERA, GDS Tariff Model, October 2014.

[581] The standing charge for B3 customers includes 2GJ of consumption from 2015 onwards.

Table 72 Authority Approved (Real) Haulage Reference Tariffs (AA4)

Real $ millions at June 2014	Units	1-July-14	1-Jan-15	1-Jan-16	1-Jan-17	1-Jan-18	1-Jan-19
Reference tariff A1							
Standing charge	$/year	46,227.59	31,632.28	31,632.28	31,632.28	31,632.28	31,632.28
Demand charge							
First 10 km	$/GJ km	194.83	133.32	133.32	133.32	133.32	133.32
Distance > 10 km	$/GJ km	102.55	70.17	70.17	70.17	70.17	70.17
Usage charge							
First 10 km	$/GJ km	0.04134	0.02828	0.02828	0.02828	0.02828	0.02828
Distance > 10 km	$/GJ km	0.02065	0.01413	0.01413	0.01413	0.01413	0.01413
Reference tariff A2							
Standing charge	$/Year	25,594.04	17,513.31	17,513.31	17,513.31	17,513.31	17,513.31
First 10 TJ	$/GJ	2.47	1.69	1.69	1.69	1.69	1.69
Volume > 10 TJ	$/GJ	1.33	0.91	0.91	0.91	0.91	0.91
Reference tariff B1							
Standing charge	$/Year	1,289.29	882.23	882.23	882.23	882.23	882.23
First 5 TJ	$/GJ	4.93	3.37	3.37	3.37	3.37	3.37
Volume > 5 TJ	$/GJ	4.22	2.89	2.89	2.89	2.89	2.89
Reference tariff B2							
Standing charge	$/Year	323.07	221.07	221.07	221.07	221.07	221.07
First 100 GJ	$/GJ	8.22	5.62	5.62	5.62	5.62	5.62
Volume > 100 GJ	$/GJ	4.90	3.35	3.35	3.35	3.35	3.35
Reference tariff B3							
Standing charge	$/Year	70.20	76.09	81.97	87.86	93.75	99.63
First 2 GJ[582]	$/GJ	13.80	nil	nil	nil	nil	nil
Volume > 2 and <10 GJ	$/GJ	13.80	9.68	9.08	8.48	7.89	7.29
Volume > 10 GJ	$/GJ	5.95	3.58	3.36	3.14	2.92	2.70

Source: ERA, GDS Tariff Model, October 2014.

[582] The standing charge for B3 customers includes 2GJ of consumption from 2015 onwards.

Required Amendment 15.

The Authority requires that ATCO update its calculation of the B3 standing charge, in addition to all haulage tariff price paths, as per Table 72 of this Draft Decision.

The Authority also requires that ATCO provide the Authority with updated avoidable costs and standalone costs by tariff class in response to this Draft Decision.

Haulage Tariff Variation Mechanism

Regulatory Requirements

1188. Rules 92 and 97 of the NGR set out requirements for an access arrangement to include a mechanism for variation of reference tariffs over the course of an access arrangement period.

92. Revenue equalisation

1) A full access arrangement must include a mechanism (a reference tariff variation mechanism) for variation of a reference tariff over the course of an access arrangement period.

2) The reference tariff variation mechanism must be designed to equalise (in terms of present values):

   a) forecast revenue from reference services over the access arrangement period; and

   b) the portion of total revenue allocated to reference services for the access arrangement period.

3) However, if there is an interval (the interval of delay) between a revision commencement date stated in a full access arrangement and the date on which revisions to the access arrangement actually commence:

   a) reference tariffs, as in force at the end of the previous access arrangement period, continue without variation for the interval of delay; but

   b) the operation of this subrule may be taken into account in fixing reference tariffs for the new access arrangement period.

97. Mechanics of reference tariff variation

1) A reference tariff variation mechanism may provide for variation of a reference tariff:

   a) in accordance with a schedule of fixed tariffs; or

   b) in accordance with a formula set out in the access arrangement; or

   c) as a result of a cost pass through for a defined event (such as a cost pass through for a particular tax); or

   d) by the combined operation of 2 or more or the above.

2) A formula for variation of a reference tariff may (for example) provide for:

   a) variable caps on the revenue to be derived from a particular combination of reference services; or

   b) tariff basket price control; or

   c) revenue yield control; or

   d) a combination of all or any of the above.

3) In deciding whether a particular reference tariff variation mechanism is appropriate to a particular access arrangement, the [ERA] must have regard to:

   a) the need for efficient tariff structures; and

   b) the possible effects of the reference tariff variation mechanism on administrative costs of the [ERA], the service provider, and users or potential users; and

   c) the regulatory arrangements (if any) applicable to the relevant reference services before the commencement of the proposed reference tariff variation mechanism; and

d) the desirability of consistency between regulatory arrangements for similar services (both within and beyond the relevant jurisdiction); and

e) any other relevant factor.

4) A reference tariff variation mechanism must give the [ERA] adequate oversight or powers of approval over variation of the reference tariff.

5) Except as provided by a reference tariff variation mechanism, a reference tariff is not to vary during the course of an access arrangement period.

ATCO's Proposed Changes

1189. ATCO's current access arrangement[583] sets out a price path in which reference tariffs for all reference services were set and varied with a formula which meant that ATCO bore the risk of variations in volume. This meant that if volumes varied from the approved forecasts, reference service revenue would be different from that forecast.

1190. ATCO has proposed to amend the tariff variation mechanism for haulage tariffs in the fourth access arrangement period. ATCO's proposed tariff variation mechanism is as follows:

- Revenue yield per delivery point for B2 and B3 tariff class customers; and
- Weighted average price cap for A1, A2 and B1 tariff class customers.

Tariff Variation Mechanism for B2 and B3 Tariff Class Customers

1191. ATCO has proposed to amend the tariff variation mechanism for B2 and B3 haulage tariffs for the fourth access arrangement period.[584] Instead of continuing to apply the current tariff basket price control, ATCO has proposed a revenue yield per delivery point[585] price control. Under its proposed revenue yield price control, ATCO would:

- Set forecast average number of delivery points and "allowed" revenue per delivery point for each year of the fourth access arrangement period in the access arrangement.
- At the end of each year of the fourth access arrangement period, calculate actual revenue per delivery point.
- When consumption per customer is less (higher) than forecast in a given year, the actual revenue per customer would be lower (higher) than the set forecast revenue per delivery point in the access arrangement. Under (over) recovered revenue per delivery point will be added (subtracted) to the corresponding tariffs two years following the given year.

1192. Table 73 includes ATCO's forecast average number of delivery points and forecast revenue per delivery point for B2 and B3 customers for the fourth access arrangement period.

583 Access Arrangement for the Mid-West and South-West Gas Distribution Systems, Revised by reason of and pursuant to orders of the Australian Competition Tribunal made on 8 June 2012, Annexure B.

584 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Annexure B.

585 A delivery point is defined as a point, including a flange or joint, specified in a Service Agreement and in the Delivery Point Register, as a point at which [User] is entitled to take delivery of Gas from [Service Provider] out of the GDS. A delivery point is equivalent to a customer or a connection.

Table 73 ATCO's Forecast Revenue per Delivery Point for B2 and B3 Customers (AA4)

	1 July 2014	1 January 2015	1 January 2016	1 January 2017	1 January 2018	1 January 2019
B2 Forecast Average Number of Delivery Points	9,932	10,346	10,792	11,270	11,781	12,326
B2 Allowed Revenue per Delivery Point (Real $ at 30 Jun 2014)	553.69	1,045.20	1,041.40	1,043.49	1,048.41	1,054.11
B3 Forecast Average Number of Delivery Points	664,763	679,549	694,284	708,948	723,542	738,065
B3 Allowed Revenue per Delivery Point (Real $ at 30 Jun 2014)	116.88	213.77	218.86	224.55	230.58	236.81

Source: ATCO Tariff Model, September 2014

1193. ATCO states that this application of a revenue yield control will be unique to the GDS, as the GDS faces circumstances unlike those in other jurisdictions, including risks associated with weather.[586] However, it notes that ATCO Gas in Canada has adopted a similar approach– known as the "weather deferral account"[587] - which has the effect of "offsetting revenue risk where temperatures are different to those forecast."

1194. ATCO states that gas consumption during the second and third access arrangement periods has been lower than forecast, which has led to significant under-recovery of revenue. ATCO states that the majority of costs associated with providing gas haulage services are fixed, which means that a reduction in consumption levels does not result in a cost reduction. ATCO also considers that there is little that it can do to address the decline in average consumption per customer. ATCO considers that a revenue yield per customer price control would manage the risk of declining average consumption. ATCO has stated that its revenue yield price control proposal for B2 and B3 customers would minimise the risk of under-recovery of revenues if actual usage is lower than forecast.

Tariff Variation Mechanism for A1, A2 and B1 Tariff Class Customers

1195. ATCO proposes a tariff basket annual tariff variation mechanism in the form of a weighed average price cap for A1, A2 and B1 customers.[588] ATCO states that a tariff basket approach provides more flexibility to adjust prices in response to changes in cost relativities amongst the tariff classes, variation from forecast volumes and variation from forecast customer numbers. ATCO considers that a weighted average price cap for A1, A2 and B1 customers will provide more efficient price signals.

586 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 289.

587 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 290.

588 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 284-285.

Cost Pass-Through Events and Notice Period

1196. ATCO has amended its cost pass-through events to include direct and indirect regulatory costs, to the extent that such costs can be demonstrated to have been reasonably excluded from the forecast conforming capital expenditure or forecast operating expenditure.

1197. ATCO has proposed to reduce the notice period for a tariff variation from 90 business days to 40 business days[589], in order to ensure that the necessary Consumer Price Index (**CPI**) statistics of the Australian Bureau of Statistics (**ABS**) are available as per the tariff variation formula.

Submissions

1198. In its submission, Alinta has outlined the following difficulties that would be faced by retailers in passing on tariff increases in line with ATCO's proposed revenue yield price control for B2 and B3 customers:

- Retailers are only entitled to increase their regulated gas tariffs by CPI each financial year. If a retailer wants to increase the tariff above this amount, it must request that the government amend the tariff regulations, being the *Energy Coordination (Gas Tariffs) Regulations 2000* (WA).
- Any volatility in ATCO prices year to year increases the risk to retailers of not being able to pass through any cost increases.
- Contracts can have a network pass-through clause that allows retailers to pass through the impact of network cost changes. If retailers are able to pass through network cost increases, ATCO's revenue yield proposal will result in material price volatility worn by customers.
- As natural gas competes with electrical, solar and LPG products, volatile prices make it more challenging for customers to make an informed product choice based on energy costs.
- Price volatility can also make it more challenging for customers to make a choice between gas retailers.
- Retailers often provide customers, particularly small business customers that tend to contract for up to three years, with a bundled retail price. If prices are volatile, the only way that retailers can offer such a product is by adding a risk premium.

1199. According to Alinta, the primary purpose of the price cap regime is to incentivise ATCO to operate efficiently given that it would be able to keep the benefit of any efficiency gains obtained during the access arrangement period. Alinta notes that the traditional price cap methodology places the risk of declining customer numbers and usage onto the entity accountable, thereby incentivising it to at least maintain its customer base at forecast usage levels. Alinta considers that a tariff variation mechanism that removes risk associated with declining customer numbers and usage may not provide incentives to ATCO to operate efficiently. Alinta states that ATCO's proposed revenue yield tariff variation mechanism is inconsistent with the *National Gas Access (WA) Local Provisions Regulations 2009*, and does not fairly apportion risk amongst

[589] Annexure B of the Proposed Access Arrangement 2014 states 40 business days; however, the Access Arrangement Information refers to 45 business days.

participants in the gas market. Alinta considers that it is not equitable for retailers to wear price risks, while the network operator does not wear any price risks.

1200. Finally, Alinta considers that the benefit of ATCO's proposed spend on an intensive business development and marketing campaign is questionable if it has proposed a revenue yield price control that ensures that it is not significantly impacted whether the campaign is effective or not.

Considerations of the Authority

1201. As per rule 92(2) of the NGR, the Authority has ensured that the approved tariff variation mechanisms for A1, A2, B1, B2 and B3 tariff classes equalise the net present value of haulage tariff revenue and total revenue allocated to haulage services. This is discussed in the Allocation of Total Revenue between Haulage Services and Other Services chapter of this Draft Decision.

1202. As discussed in the Rate of Return chapter of this Draft Decision, the Authority has decided to annually update the Debt Risk Premium (**DRP**) parameter of the WACC. ATCO has not proposed to annually update the DRP. The Authority has decided not to update the tariffs annually in response to the DRP update, but rather to adjust tariffs in the fifth access arrangement period to reflect the DRP updates. This is covered in the Fixed Principles chapter of this Draft Decision.

1203. The Authority has assessed the following in relation to NGR requirements, and has taken into account Alinta's submission in response to ATCO's proposed revised access arrangement:

- ATCO's proposed revenue yield price control for B2 and B3 customers;
- ATCO's proposed tariff basket annual tariff in the form of a weighted average price cap for A1, A2 and B1 customers;
- ATCO's proposed cost pass-through mechanism; and
- ATCO's proposed changes to the Authority's oversight powers for assessment and approval of haulage tariff variation mechanisms.

1204. Pursuant to rule 97(3) of the NGR, the Authority must have regard to the following matters when deciding whether a tariff variation mechanism is appropriate to a particular access arrangement:

- the need for efficient tariff structures;
- the possible effects of the tariff variation mechanism on the administrative costs of the Authority, ATCO, and users or potential users;
- the regulatory arrangements applicable to the relevant reference services before the commencement of the proposed tariff variation mechanism;
- the desirability of consistency between regulatory arrangements for similar services (both within and beyond Western Australia); and
- any other relevant factor.

1205. The tariff variation mechanism must have the effect of giving the Authority adequate oversight or powers of approval over variation of the reference tariff.[590] Accordingly,

[590] Rule 97(4) of the NGR.

this is a factor that the Authority must have regard to in determining whether ATCO's proposed tariff variation mechanism is appropriate.

1206. The Authority notes that, in accordance with regulation 7 of the *National Gas Access (WA) (Local Provisions) Regulations 2009*, it must also take into account the possible impact (economic or otherwise[591]) of the proposed tariff variation mechanism on small use customers and retailers.

Tariff Variation Mechanism for B2 and B3 Tariff Class Customers

1207. The Authority has assessed ATCO's proposed haulage tariff variation mechanism for B2 and B3 customers, having regard to the matters set out in rule 97(3) and rule 97(4) of the NGR, as well as the *National Gas Access (WA) (Local Provisions) Regulations 2009*.

1208. For the reasons set out below, the Authority has decided not to accept ATCO's proposed revenue yield per delivery point (customer) price control. Instead, the Authority requires ATCO to maintain the current reference tariff variation mechanism of the approved current access arrangement for B2 and B3 customers.

1209. The Authority has analysed the link between its decision to reject ATCO's proposed revenue yield price control and ATCO's accepted rate of return based on its risk portfolio in the Rate of Return chapter of this Draft Decision.

1210. The Authority notes that ATCO has cited lower than forecast consumption as an argument to implement a revenue yield per customer. ATCO considers that there is little that it can do to address the decline in average consumption per customer. However, the Authority agrees with the observation in Alinta's submission that ATCO has submitted a proposal for a significantly increased business development and marketing operating expenditure to address declining demand. The Authority discusses ATCO's proposed business development and marketing operating expenditure in the Operating Expenditure chapter of this Draft Decision.

1211. In effect, ATCO's proposed revenue yield per delivery point transfers usage risk from ATCO to future users in the form of higher forward looking tariffs. The Authority is concerned about the significant usage risk, as demand forecasts for the GDS have been higher than actual demand for both the second and third access arrangement periods.[592] ATCO states that it has addressed this through an updated forecasting methodology. However, ATCO has not provided sufficient information to satisfy the Authority that ATCO's updated demand forecasting methodology addresses the problems that gave rise to historical inaccuracy in GDS demand forecasts.

1212. The Authority also notes that allowing a revenue yield per delivery point would not incentivise ATCO to present a best estimate of the forecast customer numbers and usage for B2 and B3 customers. This is because ATCO would not be negatively impacted in cases where it overestimates B2 or B3 customer usage, as ATCO proposes to pass this risk onto customers through higher tariffs through the proposed revenue yield per delivery point tariff variation mechanism. The Authority also considers that the lack of incentive for ATCO to forecast accurately highlights an inconsistency between ATCO's proposed revenue yield and the NGO. Due to the lack

591 National Gas Access (WA) (Local Provisions) 2009, regulation 7(2).

592 ATCO Gas Australia, Access Arrangement Information, 17 March 2014, section 5.3, p. 43.

of incentive to forecast accurately, the Authority considers that ATCO's proposal does not promote efficient investment in the GDS for the long-term interests of consumers.

1213. The Authority considers that ATCO's proposed revenue yield per delivery point (customer) does not allocate risks efficiently. In particular, the Authority does not consider that it is consistent with efficient risk allocation to pass on a historical forecasting risk to customers in the form of possible higher tariffs through a revenue yield per delivery point (customer) price control.

1214. The Authority understands that under ATCO's proposed tariff variation mechanism, ATCO will calculate the average revenue per delivery point per year for B2 and B3 customers as per metering and billing data. This would mean that ATCO would consolidate customer consumption data for a given year, audit it, and match it with billing data to calculate an average revenue per delivery point/customer. ATCO would need to ensure that only correct bills are considered, and that bill corrections are incorporated. ATCO would then input the revenue variance into its proposed haulage tariff variation formula to calculate tariffs. ATCO would then apply the new tariffs to retailers. The retailers may choose to absorb the tariff changes, pass them on to customers as they occur (if possible under tariff regulations), or pass them on to customers through a premium (if possible under tariff regulations).

1215. The Authority considers that ATCO's proposed tariff variation mechanism will incur additional administrative costs as follows:

- Costs to ATCO, of auditing metering data, matching it to corrected billing data, calculating an average revenue variance, updating the tariff variation formula and implementing the updated tariff with retailers.
- Costs to retailers, of designing and implementing arrangements for an annual update of tariffs based on metering and consumption data. These arrangements would be implemented between ATCO and retailers to communicate accurate customer and consumption data and required tariff updates. These arrangements would also need to be implemented in the billing process between the retailer and its customers (if passed on). Retailers are also likely to incur additional costs to audit metering and billing data.
- Costs to customers, of unforeseen tariff increases in case revenue variance results in higher tariffs that retailers pass on to customers. The Authority is particularly concerned that customers may face price shocks under ATCO's proposal.
- Costs to the Authority, of reviewing ATCO's demand forecast, in addition to annual demand and billing data, in order to verify ATCO's revenue yield calculations and revenue variance to be applied in the tariff variation formula.

1216. The Authority does not consider that the haulage tariff variation mechanism proposed by ATCO is consistent with similar arrangements within and outside the jurisdiction. The Authority also notes that there is no precedent for a revenue yield per delivery point (customer) price control within Western Australia for natural gas or electricity service providers, nor is the Authority aware of any other examples elsewhere in Australia. The Authority notes that a revenue yield control has been used by at least one other service provider in the past in the Eastern states of Australia. ActewAGL, the gas distribution business in the Australian Capital Territory, has used a revenue yield per kWh price control, which places volume risk on ActewAGL. The ATCO proposal shifts volume risk to customers.

1217. For the following reasons, the Authority does not consider that ATCO's proposed mechanism would ensure that the Authority has adequate oversight of its proposed revenue yield tariff variation:

- ATCO has provided a tariff variation formula that does not further allocate the tariff variation to the standing or variable component of the tariff, presumably leaving that for ATCO to determine;
- ATCO has not outlined a procedure by which it would supply evidence for revenue variance calculations to the Authority; and
- ATCO has not provided a sufficiently broken down demand forecast, by tariff class and usage bracket, which would enable the Authority to verify its revenue yield per customer calculations.

1218. The Authority has assessed ATCO's proposed haulage tariff variation mechanism for B2 and B3 customers under the criteria outlined in rule 7 of the *National Gas Access (WA) (Local Provisions) 2009*. The Authority considers that ATCO's proposed revenue yield per delivery point tariff variation mechanism may result in price shocks to retailers and B2 and B3 customers that are small-use customers (if passed on).

Tariff Variation Mechanism for A1, A2 and B1 Tariff Class Customers

1219. The Authority accepts ATCO's proposed weighted average price cap for A1, A2 and B1 customers for the fourth access arrangement period.

1220. The Authority has considered the weighted average price cap for A1, A2 and B1 customers and considers that it is consistent with the NGR, in particular having regard to rule 97:

- ATCO's proposed weighted average price cap allows more scope to restructure tariffs if required, which ensures efficient tariff structures;
- ATCO's proposed weighted average price cap is not too dissimilar to the regulatory arrangements that are currently applicable to the A1, A2 and B1 customers;
- Being similar to current arrangements, the Authority does not foresee a material impact of ATCO's proposed weighted average price cap on the administrative costs of the Authority, ATCO, and users or potential users; and
- ATCO's proposed weighted average price cap is consistent with regulatory arrangements for similar services (both within and beyond Western Australia).

Cost Pass-Through Events and Notice Period

1221. ATCO has amended its cost pass-through events to include direct and indirect regulatory costs, to the extent that such costs can be demonstrated to have been reasonably excluded from the forecast conforming capital expenditure or forecast operating expenditure. In the current access arrangement, regulatory costs are part of the tariff variation formula. Actual regulatory costs are currently assessed against forecasts, and any over or under spend is reflected in the tariff. ATCO's proposal now only includes any over spend as a result of unforseen costs related to existing regulatory obligations and increases in license fees. The Authority notes the following in relation to ATCO's proposed amendment:

- ATCO's proposed amendment is asymmetric, in that it only addresses higher than forecast regulatory costs. Unforeseen benefits may reduce ATCO's regulatory costs.

- The Authority will find it difficult to reconcile regulatory cost pass throughs relating to ATCO's proposed amendment with corresponding regulatory cost forecasts in operating expenditure and capital expenditure.
- ATCO's proposed amendment does not provide the right incentives for ATCO to focus on cost efficiencies.

1222. Therefore, the Authority rejects ATCO's proposal to include increased regulatory costs as a cost pass-through.

1223. ATCO has amended clauses 3.1(iii)(A), 3.1(iv) and 3.2 in Annexure B of the access arrangement to expand the scope of the particular cost which it can claim as a cost pass-through from currently direct costs to both direct and indirect costs. In the absence of any detailed explanation from ATCO for this change, the Authority is not satisfied that it is consistent with the requirements of rule 97(3) of the NGR and the Authority rejects this change and requires the wording of the clause to be amended to only include direct costs. The Authority considers that the addition of "indirect" costs introduces ambiguity to the interpretation of these clauses during the access arrangement period.

1224. As noted in discussion in the Operating Expenditure chapter of this Draft Decision, ATCO has engaged in a competitive tender process for unaccounted for gas and has agreed with an external party on contractual terms for the fourth access arrangement period.[593] As a result, the Authority does not consider that it is necessary to maintain clause 3.1(v) of Annexure B of the access arrangement which allows for a cost pass-through event for a change in the price of unaccounted for gas given that this has been contractually determined.

1225. ATCO has proposed to reduce the notice period for tariff variation from 90 business days to 40 business days, in order to ensure that the necessary CPI statistics of ABS are available as required in the tariff variation formula.

1226. In light of its decision to reject ATCO's proposed revenue yield price control and regulatory cost pass throughs, the Authority considers that 40 days is sufficient to assess ATCO's proposed tariff variation. The Authority accepts ATCO's proposal to reduce the notice period for tariff variation from 90 business days to 40 business days. The Authority notes that no other changes are proposed to the notice procedure as outlined in the current access arrangement.

Required Amendment 16.

The Authority requires that ATCO remove references to revenue yield in Annexure A, and remove clause 2 and clause 3 (B) and update all the formulas in Annexure B of the Access Arrangement to reflect the following:

> To maintain the current tariff variation mechanism for B2 and B3 customers for the fourth access arrangement period as in the approved current access arrangement;

[593] ATCO Gas Australia, Letter to the ERA, 30 July 2014.

> To exclude cost pass-throughs for regulatory costs (clause 3.1 (iii) (B) of Annexure B); and

The Authority also requires that ATCO reword clause 3.1 (iii) (A) in Annexure B as follows:

> "Conforming Capital Expenditure or Conforming Operating Expenditure as a direct result of a Change in Law or Tax Change."

The Authority requires that ATCO reword clause 3.1 (iv) in Annexure B as follows:

> "ATCO Gas Australia incurs Conforming Capital Expenditure or Conforming Operating Expenditure as a direct result of any Law that imposes a fee or Tax on greenhouse gas emissions or concentrations; and for avoidance of doubt, this expenditure includes only direct capital or direct operating expenditure associated with preparation for, compliance with the Laws which implement, and the participation in, the Emissions Trading Scheme; and liability only for direct capital or direct operating expenditure transferred to ATCO Gas Australia from another entity as a direct result of accordance with the Emissions Trading Scheme."

The Authority requires the removal of clause 3.1(v) in Annexure B.

The Authority requires that ATCO reword clause 3.2 in Annexure B as follows: "If a Cost Pass Through Event occurs, ATCO Gas Australia must notify the ERA of the Cost Pass Through Event, and may vary one or more Haulage Tariffs to recover only direct Conforming Operating Expenditure and depreciation of and return on direct Conforming Capital Expenditure incurred or forecast to be incurred by ATCO Gas Australia (or on ATCO Gas Australia's behalf) as a direct result of the Cost Pass Through Event, provided that these costs have not already been recovered by ATCO Gas Australia.

A consequential amendment is required to clause 4.2. The Authority requires ATCO to amend the wording of clause 4.2 to read:

"ATCO Gas Australia will use its best endeavours to give the ERA a variation report at least 40 Business Days before the date on which the Haulage Tariff is to be varied as a result of a Cost Pass Through Event, and that report shall contain the following information:

(a) a statement of reasons for the variation of the Haulage Tariff as a result of the Cost Pass Through Event;..."

Ancillary Service Tariffs

Regulatory Requirements

1227. Rule 94 of the NGR sets out the requirements for the determination of reference tariffs for distribution pipelines. Rule 94 of the NGR is reproduced above under the Haulage Service Tariffs chapter of this Draft Decision.

ATCO's Proposed Changes

1228. ATCO has proposed to continue offering the same ancillary services in the fourth access arrangement period as currently offered in the third access arrangement period. These services are requested by retailers, and are as follows:

- Applying a meter lock: apply lock to a valve that is part of the delivery facility, in order to prevent gas from being received at the corresponding delivery point. This service applies to B3 customers.
- Removing a meter lock: remove lock that has been applied to a valve to prevent gas from being received at the corresponding delivery point. This service applies to B3 customers.
- Deregistering a delivery point: deregister a delivery point permanently by removing the delivery facility, removing the delivery point (in accordance with the Retail Market Rules) and removing the delivery point from the delivery register. This service applies to all customers.
- Disconnecting a delivery point: disconnect a delivery point physically to prevent gas from being delivered to the delivery point. This service applies to B2 and B3 customers.
- Reconnecting a delivery point: reconnect a delivery point to allow gas to be delivered to the delivery point. This service applies to B2 and B3 customers.

1229. Annexure C of the proposed Access Arrangement sets out the reference tariffs associated with the ancillary services and the associated reference tariff variation mechanism.

1230. ATCO has proposed to calculate ancillary service tariffs on a cost recovery basis. ATCO has calculated the cost of ancillary services as follows:

- Calculate costs for each ancillary service per unit of activity. ATCO has forecast a decrease in such costs as a result of more efficient work practices and competitive tender for meter lock services.[594]
- Forecast activity volume for each ancillary service based on historical averages.[595]
- Inflate activity volumes for *applying a meter lock* and *removing a meter lock* based on growth in B3 customers.[596]

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594 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, pp. 279-280.

595 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 280.

596 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 280.

- Grow activity volume for *deregistering a delivery point* by one per cent annually to reflect demolitions as a result of re-zoning.[597]
- Grow activity volume for *disconnecting a delivery point* and *reconnecting a delivery point* in line with historical trends.[598]

1231. Table 74 sets out ATCO's proposed ancillary service tariffs and revenue.

Table 74 ATCO Proposed Ancillary Service Tariffs, Volumes and Revenues (AA4)

	July-Dec 2014[599]	2015	2016	2017	2018	2019
Applying a meter lock						
Charging parameter ($/activity)	54.75	40.25	40.25	40.25	40.25	40.25
Activity volume (/year)	2,600	2,678	2,758	2,841	2,926	3,014
Revenue (Real $ millions at 30 June 2014)	0.06	0.11	0.11	0.11	0.12	0.12
Removing a meter lock						
Charging parameter ($/activity)	19.31	15.77	15.78	15.78	15.78	15.78
Activity volume (/year)	2,300	2,369	2,440	2,513	2,589	2,666
Revenue (Real $ millions at 30 June 2014)	0.02	0.04	0.04	0.04	0.04	0.04
Deregistering a delivery point						
Charging parameter ($/activity)	164.54	105.37	107.42	109.52	111.66	113.83
Activity volume (/year)	1,907	2,097	2,181	2,202	2,224	2,247
Revenue (Real $ millions at 30 June 2014)	0.13	0.22	0.23	0.24	0.25	0.26
Disconnecting a delivery point						
Charging parameter ($/activity)	110.11	80.63	88.20	88.44	88.70	88.96
Activity volume (/year)	1,400	1,442	1,485	1,530	1,576	1,623
Revenue (Real $ millions at 30 June 2014)	0.06	0.12	0.13	0.14	0.14	0.14
Reconnecting a delivery point						
Charging parameter ($/activity)	148.08	108.91	117.35	117.55	117.76	117.97
Activity volume (/year)	1,288	1,327	1,366	1,407	1,450	1,493
Revenue (Real $ millions at 30 June 2014)	0.08	0.14	0.16	0.17	0.17	0.18

Source: ATCO Gas Australia, Access Arrangement Information, 17 March 2014, Tables 94 and 95, pp. 280-281. ATCO Gas Australia, Tariff Model, September 2014.

Submissions

1232. The Authority has not received any submissions in relation to ATCO's proposed ancillary service tariffs in its proposed revised access arrangement.

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597 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 280.

598 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 280.

599 The revenue for each ancillary service for Jul-Dec 2014 is calculated by multiplying the charging parameter with part of the annual activity volume.

Considerations of the Authority

1233. The Authority has assessed ATCO's proposed method for calculating ancillary service tariffs for the fourth access arrangement period against the requirements of rule 94 of the NGR.

1234. The Authority agrees with ATCO's overall method. The Authority approves ATCO's proposed ancillary service tariffs for the fourth access arrangement period. As noted in paragraph 316, the Authority has assumed that these services are externally sourced by ATCO. The Authority requires ATCO to confirm this and if these services are provided using internal resources, further justification on the efficiency of these costs. The Authority also requires that ATCO justify whether the ancillary service revenue to be recovered for each customer lies between an upper bound (the stand alone cost of providing the reference service to the customer) and a lower bound (the avoidable cost of not providing the reference service to the customer) as per rule 94(3) of the NGR.

1235. The Authority has adjusted ATCO's escalation of activity volumes for *applying a meter lock* and *removing a meter lock* based on the Authority's adjusted growth in B3 customers rather than ATCO's forecast growth in B3 customers. The Authority's adjusted growth in B3 customers is discussed in the Demand Forecast chapter of this Draft Decision. To ensure compliance with rule 94(5) of the NGR, the Authority has adjusted ATCO's activity volumes and corresponding revenues for *applying a meter lock* and *removing a meter lock* from 2015 to 2019.

1236. Table 75 shows the Authority's adjusted ancillary service volumes and revenues for the fourth access arrangement period.

Table 75 Authority Approved Ancillary Service Volumes and Revenues (AA4)

	July-Dec 2014[600]	2015	2016	2017	2018	2019
Applying a meter lock						
Charging parameter ($/activity)	54.75	40.25	40.25	40.25	40.25	40.25
Activity volume (/year)	2,600	2,632	2,689	2,723	2,756	2,791
Revenue (Real $ millions at 30 June 2014)	0.06	0.11	0.11	0.11	0.11	0.11
Removing a meter lock						
Charging parameter ($/activity)	19.31	15.77	15.78	15.78	15.78	15.78
Activity volume (/year)	2,300	2,328	2,420	2,469	2,544	2,619
Revenue (Real $ millions at 30 June 2014)	0.02	0.04	0.04	0.04	0.04	0.04
Deregistering a delivery point						
Charging parameter ($/activity)	164.54	105.37	107.42	109.52	111.66	113.83
Activity volume (/year)	1,907	2,097	2,181	2,202	2,224	2,247
Revenue (Real $ millions at 30 June 2014)	0.13	0.22	0.23	0.24	0.25	0.26
Disconnecting a delivery point						
Charging parameter ($/activity)	110.11	80.63	88.20	88.44	88.70	88.96
Activity volume (/year)	1,400	1,442	1,485	1,530	1,576	1,623
Revenue (Real $ millions at 30 June 2014)	0.06	0.12	0.13	0.14	0.14	0.14
Reconnecting a delivery point						
Charging parameter ($/activity)	148.08	108.91	117.35	117.55	117.76	117.97
Activity volume (/year)	1,288	1,327	1,366	1,407	1,450	1,493
Revenue (Real $ millions at 30 June 2014)	0.08	0.14	0.16	0.17	0.17	0.18

Required Amendment 17.

The Authority requires that ATCO adjust the ancillary service volumes and tariffs as per Table 75 of this Draft Decision.

The Authority requires ATCO to confirm that ancillary services are provided by external resources, and if these services are provided using internal resources, further justification on the efficiency of these costs.

The Authority requires that ATCO justify whether the ancillary service revenue to be recovered for each customer lies between an upper bound (the stand alone cost of providing the reference service to the customer) and a lower bound (the avoidable cost of not providing the reference service to the customer) as per rule 94(3) of the NGR.

600 The revenue for each ancillary service for Jul-Dec 2014 is calculated by multiplying the charging parameter with part of the annual activity volume.

Ancillary Service Tariff Variation Mechanism

Regulatory Requirements

1237. Rules 92 and 97 of the NGR set out requirements for an access arrangement to include a mechanism for variation of reference tariffs during an access arrangement period. Rules 92 and 97 of the NGR are reproduced above under the Haulage Tariff Variation Mechanism chapter of this Draft Decision.

ATCO's Proposed Changes

1238. ATCO has proposed to vary ancillary service tariffs in the fourth access arrangement period based on the Wage Price Index (**WPI**) for Western Australia.[601] ATCO's ancillary service tariff variation mechanism for the third access arrangement period varied tariffs based on the Consumer Price Index (**CPI**) – Weighted Average for Eight Capital Cities.

Submissions

1239. The Authority has not received any submissions in relation to ATCO's proposed ancillary service tariff variation mechanism in its proposed revised access arrangement.

Considerations of the Authority

1240. ATCO has not provided an explanation for its proposed change to the ancillary service tariff variation mechanism pursuant to which ancillary service tariff variations are determined by reference to the WPI. Moreover, ATCO states in its revised access arrangement information that it proposes to vary ancillary service tariffs by CPI, contrary to what is stated in Annexure C of the access arrangement, that is that ATCO proposes to vary ancillary service tariffs by WPI.[602]

1241. The Authority has decided to reject ATCO's proposed ancillary service tariff variation mechanism which increases ancillary service tariffs by WPI given the lack of rationale provided by ATCO as to the need for this change. Pursuant to rule 72(1)(k) of the NGR, the service provider's access arrangement information must include a rationale for any proposed reference tariff variation mechanism. The Authority has decided that ATCO's ancillary service tariff variation mechanism should continue to be based on CPI – Weighted Average for Eight Capital Cities.

Required Amendment 18.

The Authority requires that ATCO amend Annexure C of the Access Arrangement to reflect the Authority's decision that the ancillary service tariff variation be varied based on the Consumer Price Index – Weighted Average for Eight Capital Cities.

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601 ATCO Gas Australia, *Access Arrangement for the Mid-West and South-West Gas Distribution Systems*, 17 March 2014, Annexure C, p. 45.

602 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 284.

Other Access Arrangement Provisions

Application Procedure

Regulatory Requirements

1242. NGR Rule 112 - Request for access, provides that a prospective user 'may' request a scheme pipeline service provider to provide a pipeline service for the prospective user.

112. Requests for access

1) A prospective user may request a scheme pipeline service provider to provide a pipeline service for the prospective user.

2) The request must be made in writing and must:

   a) state the time or times when the pipeline service will be required and the capacity that is to be utilised; and

   b) identify the entry point where the user proposes to introduce natural gas to the pipeline or the exit point where the user proposes to take natural gas from the pipeline or, if the requested service is a haulage service, both entry and exit point; and

   c) state the relevant technical details (including the proposed gas specification) for the connection to the pipeline, and for ensuring safety and reliability of the supply of natural gas to, or from, the pipeline.

3) The service provider must, within 20 business days after the date of the request, respond to the request:

   a) by informing the prospective user:

      (i) whether the service provider can provide the requested pipeline service; and

      (ii) if so, the terms and conditions on which the service provider is prepared to provide the requested pipeline service;

   b) by informing the prospective user that the service provider needs to carry out further investigation to determine whether it can provide the requested pipeline service and setting out a proposal for carrying out the further investigation including:

      (i) a statement of the nature of the investigation; and

      (ii) a plan (including a time schedule) for carrying out and completing the investigation; and

      (iii) a statement of the reasonable costs of the investigation the prospective user would be required to meet.

4) If the service provider informs the prospective user that it cannot provide the requested pipeline service, the service provider must:

   a) provide the prospective user with written reasons explaining why the requested pipeline service cannot be provided; and

   b) if there is some prospect that it will become possible to provide the requested service at some time in the future – give details (which must be as specific as the circumstances reasonably allow) of when capacity to provide the requested service is likely to become available and, if possible, nominate a specific date.

5) If the service provider responds to the request by proposing further investigation, the following provisions apply:

a) if the parties have not agreed on the service provider's proposal or some negotiated modification of it within 20 business days after the date of the response – the service provider is taken to have rejected the prospective user's request; and

b) if the parties agree on the service provider's proposal or on some negotiated modification of it within 20 business days after the date of the response – the service provider must carry out the investigation in accordance with the agreement and, on the conclusion of the investigation, inform the prospective user whether it can, or cannot, provide the requested pipeline service and comply with other relevant requirements of this rule.

ATCO's Proposed Changes

1243. ATCO has proposed an amendment to the access arrangement application procedure. Clause 5.5(a) of the current access arrangement lists preconditions to and restrictions on the provision of services. ATCO's proposed revised access arrangement adds a new precondition that the prospective user satisfies the service provider's reasonable minimum prudential and insurance requirements (clause 5.5(a)(x)). [603]

1244. Clause 5.5(b) of the proposed revised access arrangement purports to grant ATCO the right to remove, add to or vary one or more of the pre-conditions listed in clause 5.5(a).

Submissions

1245. The Authority did not receive any submissions that related to the application procedure for the proposed revised access arrangement.

Considerations of the Authority

1246. The Authority notes that clause 5.5(a)(x) of the proposed revised access arrangement appears to restate the elements of clause 1(a)(iii)(B) of the proposed revised template haulage contract. The Authority has not identified any benefit achieved by this duplication, but has identified associated risks. Specifically, the Authority is concerned about inconsistent wording (the clauses are not identical) and the tendency for duplication to complicate the ongoing task of maintaining consistency in an access arrangement. Accordingly, clause 5.5(a)(x) of the proposed revised access arrangement should be deleted.

1247. Several paragraphs listed under clause 5.5(a) in the current access arrangement are similar to clause 5.5(a)(x) in that they set out preconditions that may be better left to be addressed in the template haulage contract.

1248. Clause 5.5(a)(vi) requires the prospective user to satisfy ATCO that it will comply with the approved System Pressure Protection Plan – a precondition very similar to the condition precedent set out in clause 1(a)(iii)(A) in the proposed revised template haulage contract. Accordingly, the Authority has decided that clause 5.5(a)(vi) of the proposed revised access arrangement should be deleted.

1249. Clause 5.5(a)(xi) commits the user to comply with gas quality specifications under the service agreement. This commitment appears superfluous given the user obligations

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[603] ATCO Gas Australia, *Access Arrangement for the Mid-West and South-West Gas Distribution Systems*, 17 March 2014, Clause 5.5, pp. 12-14.

imposed under the proposed revised template haulage contract, including the obligation to ensure compliance with the gas quality specifications (clause 6.1(a)) and the obligation to indemnify the service provider if it fails to do so (clause 6.5). Accordingly, clause 5.5(a)(xi) of the proposed revised access arrangement should be deleted.

1250. Clause 5.5(b) of the proposed revised access arrangement raises a separate concern for the Authority. The clause purports to allow ATCO to modify the preconditions and requirements for providing access to reference services.

1251. The Authority considers that ATCO's proposed clause 5.5(b) grants broad powers to the service provider to introduce additional preconditions. The qualification that ATCO's rights under clause 5.5(b) would be "subject to the National Gas Access Law" does not address the Authority's concern. Access seekers are likely to face time pressures that would make it difficult to justify using dispute resolution procedures to test the limitations imposed by that phrase. Moreover, the service provider is already protected by an extensive set of preconditions and the Authority cannot see why it requires the discretion to impose additional preconditions. Therefore, the Authority has decided that clause 5.5(b) of the proposed revised access arrangement should be deleted.

Required Amendment 19.

Clauses 5.5(a)(vi), 5.5(a)(x), 5.5(a)(xi) and 5.5(b) of the proposed revised access arrangement should be deleted.

Capacity Trading Requirements

Regulatory Requirements

1252. The NGR provides for capacity trading requirements.

105. Capacity trading requirements

1) Capacity trading requirements must provide for transfer of capacity:

   a) if the service provider is registered as a participant in a particular gas market – in accordance with rules or Procedures governing the relevant gas market; or

   b) if the service provider is not so registered, or the relevant rules or Procedures do not deal with capacity trading – in accordance with this rule.

2) A user may, without the service provider's consent, transfer, by way of subcontract, all or any of the user's contracted capacity to another (the third party) with the following consequences:

   a) the transferor's rights against, and obligations to, the service provider are (subject to paragraph (b)) unaffected by the transfer; but

   b) the transferor must immediately give notice to the service provider of:

      i) the subcontract and its likely duration; and

      ii) the identity of the third party; and

      iii) the amount of the contracted capacity transferred.

3) A user may, with the service provider's consent, transfer all or any of the user's contracted capacity to another (the third party) with the following consequences:

a) the transferor's rights against, and obligations to, the service provider are terminated or modified in accordance with the capacity trading requirements; and

b) a contract arises between the service provider and the third party on terms and conditions determined by or in accordance with the capacity trading requirements.

4) The service provider must not withhold its consent under subrule (3) unless it has reasonable grounds, based on technical or commercial considerations, for doing so.

5) An adjustment of rights and liabilities under subrule (3) does not affect rights or liabilities that had accrued under, or in relation to, the contract before the transfer took effect.

6) The capacity trading requirements may specify in advance conditions under which consent will or will not be given, and conditions to be complied with if consent is given.

ATCO's Proposed Changes

1253. ATCO has proposed only minimal revisions to the current access arrangement in relation to capacity trading requirements.[604]

1254. The changes relate to updating the service provider's name from WAGN to ATCO Gas Australia, and updating cross-references to clauses in the Template Haulage Contract.

Submissions

1255. The Authority did not receive any submissions that related to capacity trading requirements.

Considerations of the Authority

1256. The Authority has considered ATCO's proposed revisions to the capacity trading requirements of the proposed revised access arrangement.

1257. ATCO's proposed inclusion of clause 14.3(c)(iii) in the template haulage contract (discussed further below) prompted a comparison between clauses 14.2 and 14.3 of the proposed revised template haulage contract and section 6 of the proposed revised access arrangement. This revealed some inconsistencies between the two. Specifically:

- template haulage contract clause 14.2 appears to have a similar meaning to access arrangement clause 6.3(a), but different wording. Likewise, proposed revised template haulage contract clauses 14.3(a); 14.3(c)(i); 14.3(c)(ii); 14.3(c)(iv); and 14.3(b); appear to have similar meanings, though different wordings, to access arrangement clauses 6.3(b); 6.4(a)(i); 6.4(a)(ii); 6.4(a)(iii); 6.3(c); and 6.3(b) respectively.
- access arrangement clause 6.3(b)(ii) does not appear to have a corresponding equivalent in the template haulage contract.

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604 ATCO Gas Australia, *Access Arrangement for the Mid-West and South-West Gas Distribution System*, 17 March 2014, section 6, p. 15.

- template haulage contract clause 14.3(c)(iii) does not appear to have a corresponding equivalent in the access arrangement.

1258. The Authority considers that the overlap on these matters in section 6 of the access arrangement and clause 14 of the proposed revised template haulage contract complicates the task of interpretation.

1259. It is a requirement under rule 48(f) of the NGR that an access arrangement must set out the capacity trading requirements. The Authority considers that this requirement can be met by the inclusion of the detailed capacity trading requirements in either, rather than in both, section 6 of the access arrangement or clause 14 of the template haulage contract. It is likely to be most convenient to the parties for their haulage contract to set out any capacity trading requirements within the agreement. Accordingly, the Authority considers that the template haulage contract is the better instrument in which to set out the detail of the capacity trading requirements that will apply to reference services under the access arrangement.

1260. As a result, the Authority considers that clause 6.1 of the proposed revised access arrangement should be retained, but amended to explain that reference services include qualified rights for a user to transfer capacity. Clauses 6.2 to 6.4 of the access arrangement should be deleted.

Required Amendment 20.

Clause 6.1 of the access arrangement should be amended as follows:

> 6.1 Capacity Trading Requirements to be specified in the Service Agreement
>
> A User's right to transfer its contracted capacity to another person will be set out in the User's Service Agreement with ATCO Gas Australia. The terms and conditions for the transfer of contracted capacity for Haulage Services are set out in clause 14 of the Template Haulage Contract. <u>In accordance with the Template Haulage Contract, a user will have qualified rights to transfer some or all of its contracted capacity for Haulage Services to one or more third parties.</u>

Clauses 6.2 to 6.4 of the access arrangement should be deleted.

Extension and Expansion Requirements

Regulatory Requirements

1261. The NGR provides for extension and expansion requirements.

> 104 Extension and expansion requirements
>
> 1) Extension and expansion requirements may state whether the applicable access arrangement will apply to incremental services to be provided as a result of a particular extension to, or expansion of the capacity of, the pipeline or may allow for later resolution of that question on a basis stated in the requirements.
>
> 2) Extension and expansion requirements included in a full access arrangement must, if they provide that an applicable access arrangement is to apply to incremental services, deal with the effect of the extension or expansion on tariffs.

3) The extension and expansion requirements cannot require the service provider to provide funds for work involved in making an extension or expansion unless the service provider agrees.

1262. Extension and expansion requirements are defined under section 2 of the NGL(WA).

2. Extension and expansion means –

a) the requirements contained in an access arrangement that, in accordance with the Rules, specify—

i) the circumstances when an extension to, or expansion of the capacity of, a covered pipeline is to be treated as forming part of the covered pipeline; and

ii) whether the pipeline services provided or to be provided by means of, or in connection with, spare capacity arising out of an extension to, or expansion of the capacity of, a covered pipeline will be subject to the applicable access arrangement applying to the pipeline services to which that arrangement applies; and

iii) whether an extension to, or expansion of the capacity of, a covered pipeline will affect a reference tariff, and if so, the effect on the reference tariff; and

b) any other requirements specified by the Rules as extension and expansion requirements; …

1263. In addition to the definitions under section 2 of the NGL(WA), the NGL(WA) also provides for extension and expansion requirements.

18. Certain extensions to, or expansion of the capacity of, pipelines to be taken to be part of a covered pipeline

For the purposes of this Law—

a) an extension to, or expansion of the capacity of, a covered pipeline must be taken to be part of the covered pipeline; and

b) the pipeline as extended or expanded must be taken to be a covered pipeline, if, by operation of the extension and expansion requirements under an applicable access arrangement, the applicable access arrangement will apply to pipeline services provided by means of the covered pipeline as extended or expanded.

1264. Under rule 100 of the NGR, the extension and expansion policy must also be consistent with the National Gas Objective.

ATCO's Proposed Changes

1265. ATCO has proposed only minimal revisions to the current access arrangement in relation to extension and expansion requirements.[605]

1266. The changes relate to updating the service provider's name from WAGN to ATCO Gas Australia, and the capitalising of the term Business Days, as this term is defined in the proposed access arrangement glossary.

[605] ATCO Gas Australia, *Access Arrangement for the Mid-West and South-West Gas Distribution System*, 17 March 2014, section 7, p. 17.

1267. All expansions of the capacity of the covered GDS are to be covered under the access arrangement. Expansions would not affect reference tariffs during the access arrangement period.

1268. All extensions of medium and low pressure pipelines of the covered GDS are to be covered under the access arrangement. Such extensions would not affect reference tariffs during the access arrangement period.

1269. ATCO will apply to the Authority in writing in relation to extensions of high pressure pipelines of the covered GDS. The Authority would then decide whether or not such extensions are to be covered under the access arrangement.

Submissions

1270. The Authority did not receive any submissions that related to the extension and expansion requirements of the proposed access arrangement.

Considerations of the Authority

1271. Neither the access arrangement nor the access arrangement information include definitions of what constitutes a low pressure, medium pressure or high pressure pipeline.

1272. The glossary in the access arrangement information includes a definition of what constitutes a Medium Pressure/Low Pressure System but this still does not distinguish between what is medium and what is low pressure, the definition groups the two together.

1273. The glossary in the access arrangement information contains a definition for a High Pressure Pipeline Extension but not what is a high pressure pipeline. The definition of a High Pressure Pipeline Extension is as follows:

> High Pressure Pipeline Extension - means for the purpose of the Template Haulage Contract an extension to <Service Provider> Covered Pipeline with a direct connection to a transmission pipeline that provides reticulated gas to a new development or an existing development not serviced with reticulated gas.

1274. Section 7 of the Access Arrangement on Extensions and Expansion Requirements distinguishes between High Pressure Pipeline Extensions (section 7.1) and extensions of medium and low pressure pipelines (section 7.2).

1275. Extensions under section 7.2 of the Access Arrangement treats medium and low pressure pipelines as part of the covered pipeline and accordingly covered by the Access Arrangement.

1276. If ATCO proposes an extension under section 7.1 of the Access Arrangement using high pressure pipelines of the covered pipeline it must apply in writing to the Authority for a decision on whether the proposed extension will be taken to form part of the covered pipeline and will be covered by the Access Arrangement.

1277. Taking into account the proposed section 7 of the Access Arrangement and the definition of a High Pressure Pipeline Extension, then an extension using high pressure that does not have a direct connection to a transmission pipeline would not fall into either section 7.1 or 7.2.

1278. Accordingly, amendments are required to both the Acess Arrangement and the glossary to ensure that all pipelines are adequately defined and all extensions to the different pipeline categories are captured under either section 7.1 or 7.2 of the Access Arrangement.

1279. In reviewing this issue and identifying the gap in that some high pressure pipelines are not defined under this policy, the Authority has considered the appropriate treatment for these high pressure pipelines. The Authority considers that there may be high pressure pipeline extensions, which are not directly connected to a transmission pipeline, which are of a significant size that warrant a consideration of whether these pipelines should be covered, while others may warrant automatic coverage. The Authority has reviewed what may be an appropriate threshold for determining under which section (7.1 or 7.2) a high pressure pipeline extension falls into. The Authority has determined that any high pressure pipeline extensions greater than 1,000kPa and over 25km in length should also be captured by section 7.1 of the proposed Access Arrangement.

Required Amendment 21.

Include definitions in the access arrangement on what constitutes a low pressure, medium pressure and high pressure pipeline in the access arrangement.

Amend section 7.2 Extensions of medium and low pressure pipelines to include high pressure pipelines not captured by the High Pressure Pipeline Extension definition.

Amend the definition of a High Pressure Pipeline Extension as follows: “means for the purpose of the Template Haulage Contract and for section 7 of the Access Arrangement an extension to <Service Provider> Covered Pipeline with a direct connection to a transmission pipeline that provides reticulated gas to a new development or an existing development not serviced with reticulated gas <u>or an extension to <Service Provider> Covered Pipeline with a Maximum Allowable Operating Pressure of greater than 1,000kPa and greater than 25km in length.</u>

Changing Receipt Points and Delivery Points

Regulatory Requirements

1280. The NGR provides for changing receipt and delivery points.

106. Change of receipt or delivery point by user

(1) An access arrangement must provide for the change or a *receipt or delivery point* in accordance with the following principles:

a) a user may, with the service provider’s consent, change the user’s receipt or delivery point;

b) the service provider must not withhold its consent unless it has reasonable grounds, based on technical or commercial considerations, for doing so.

(2) The access arrangement may specify in advance conditions under which consent will or will not be given, and conditions to be complied with if consent is given.

ATCO's Proposed Changes

1281. ATCO has proposed only minimal revisions to the current access arrangement in relation to changing receipt points and delivery points.[606]

1282. The changes relate to updating the service provider's name from WAGN to ATCO Gas Australia, and updating cross-references to clauses in the Template Haulage Contract.

Submissions

1283. The Authority did not receive any submissions that related to the changing of receipt points and delivery points.

Considerations of the Authority

1284. The Authority has considered and accepted ATCO's proposed minor revisions to the changing of receipt points and delivery points of the current access arrangements.

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606 ATCO Gas Australia, *Access Arrangement for the Mid-West and South-West Gas Distribution System*, 17 March 2014, section 8, p. 19.

Fixed Principles

Regulatory Requirements

1285. Rule 99 of the NGR provides for an access arrangement to include fixed principles.

> 99. Fixed principles
>
> 1) A full access arrangement may include a principle declared in the access arrangement to be fixed for a stated period.
>
> 2) A principle may be fixed for a period extending over 2 or more access arrangement periods.
>
> 3) A fixed principle approved before the commencement of these rules, or approved by the [ERA] under these rules, is binding on the [ERA] and the service provider for the period for which the principle is fixed.
>
> 4) However:
>
> a) the [ERA] may vary or revoke a fixed principle at any time with the service provider's consent; and
>
> b) if a rule is inconsistent with a fixed principle, the rule operates to the exclusion of the fixed principle.

ATCO's Proposed Changes

1286. ATCO has proposed to revise its current access arrangement in relation to fixed principles.[607]

1287. ATCO proposes that the existing fixed principles that are due to expire on 25 August 2015 be retained for a further ten years.[608] Clause 11.1 of ATCO's proposed access arrangement sets out the fixed principles approved by the Authority on 25 August 2005 for a period of ten years. The fixed principles are as follows:

> (a) the financing structure (being a 60/40 debt/equity ratio) that has been assumed for the purposes of determining the Rate of Return for the WAGN GDS;
>
> (b) the straight-line method of depreciation for each group of assets referred to in part 9; and
>
> (c) that FRC costs that are incurred, or are expected to be incurred, in the delivery of Reference Services are included as a component of Operating Expenditure;
>
> (d) the inclusion of:
>
> (i) HHV Costs that are Conforming Capital Expenditure in the Opening Capital Base for the WAGN GDS at the Revision Commencement Date; and
>
> (ii) in Total Revenue HHV Costs that are Operating Expenditure for the Next Access Arrangement Period in respect of the WAGN GDS,
>
> in respect of which Reference Tariffs have been varied as a Cost Pass Through Event.'

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607 ATCO Gas Australia, *Access Arrangement for the Mid-West and South-West Gas Distribution System*, 17 March 2014, pp. 22-24.

608 ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, Section 14.4, p. 297.

1288. ATCO proposes to add a principle to the existing fixed principles in clause 11.2 of the current access arrangement, which was approved by the Authority for ten years commencing on 1 January 2011. ATCO has not addressed this proposed addition in the access arrangement information. Clause 11.2 of ATCO's proposed access arrangement sets out the fixed principles approved by the Authority for a period of ten years commencing on 1 January 2011, and includes a new principle (a):

> (a) the Cost Pass Through Events and variation mechanism set out in clause 3 of Annexure B;
>
> (b) the inclusion of:
>
> (i) Physical Gate Point Costs that constitute Conforming Capital Expenditure in the Opening Capital Base for the WAGN GDS for the Next Access Arrangement Period; and
>
> (ii) Physical Gate Point Costs that constitute Conforming Operating Expenditure in Total Revenue for the Next Access Arrangement Period in respect of the WAGN GDS,
>
> in respect of which Reference Tariffs have been varied as a Cost Pass Through Event.

1289. Moreover, ATCO proposes to add two new fixed principles 11.3 and 11.4 to address the following:

- Calculation of depreciation from 1 July 2015 until 1 January 2030 under ATCO's proposed transition from Current Cost Accounting (**CCA**) to Historical Cost Accounting (**HCA**).
- Application of revenue over/under recovery under ATCO's proposed revenue yield price control for B2 and B3 tariff class customers in the fifth access arrangement period.

Submissions

1290. Kleenheat Gas has expressed concern with the short to medium-term impact of ATCO's proposed transition from CCA to HCA.

1291. Alinta has outlined difficulties that would be faced by retailers in passing on tariff increases in line with ATCO's proposed revenue yield price control for B2 and B3 customers. Alinta has also noted that ATCO's proposed revenue yield tariff variation mechanism is inconsistent with access regulations, and does not fairly apportion risk amongst participants in the gas market.

Considerations of the Authority

1292. The Authority has considered ATCO's proposal to extend the fixed principles under clause 11.1 in its proposed revised access arrangement.[609]

1293. The Authority accepts ATCO's proposal that the fixed principles relating to straight-line depreciation and Higher Heating Value (**HHV**) costs remain relevant and provide stability for the business and customers across regulatory periods. The Authority accepts ATCO's proposal to extend fixed principles (b) and (d) in clause 11.1 until 25 August 2025.

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[609] ATCO has erroneously stated in the access arrangement information that it proposes to retain 11.1 until 31 December 2029 (ATCO Gas Australia, *Access Arrangement Information*, 17 March 2014, p. 297).

1294. The Authority considers that ATCO's proposal that the fixed principles relating to 60:40 capital structure and Full Retail Contestability (**FRC**) costs are no longer relevant. The NGR requires that the Authority issue Rate of Return Guidelines once every three years. These guidelines address financing structure and debt/equity ratio. Alinta introduced FRC in 2003. ATCO has reported no full retail contestability operating expenditure since 2010, and has forecast no such operating expenditure for the fourth access arrangement period.[610] The Authority does not see any reason why FRC should be a fixed principle and thus rejects ATCO's proposal to extend fixed principles clause 11.1 (a) and (c) until 25 August 2025.

1295. The Authority has considered ATCO's proposal to add cost pass through events and the reference tariff variation mechanism to the existing fixed principles under 11.2, which was approved by the Authority for ten years commencing on 1 January 2011. The Authority considers that the fixed principle in relation to clause 11.2(b) should remain as this was approved in the current access arrangement to apply for 10 years from 1 January 2011.

1296. The Authority rejected WAGN's proposal for cost pass through events and the reference tariff variation mechanism to be fixed principles during the third access arrangement review.[611] The Authority considered that the inclusion of cost pass through events and tariff variation would be inconsistent with the National Gas Objective (**NGO**). The Authority considered that fixing cost pass through events and tariff variation for ten years is inconsistent with the promotion of efficient investment in natural gas services. The Authority maintains the view that fixing cost pass through events and tariff variation for ten years is inconsistent with the NGO.

1297. ATCO proposed a new fixed principle under clause 11.3 of its access arrangement. The fixed principle allows ATCO to transition its depreciation method from CCA to HCA over two access arrangement periods. The Authority has rejected ATCO's proposed depreciation method in the Depreciation chapter of this Draft Decision. Therefore, the Authority rejects ATCO's proposed fixed principle in clause 11.3.

1298. ATCO proposed a second new fixed principle under clause 11.4 of its access arrangement. The fixed principle allows ATCO to recover revenue associated with the revenue yield price control for B2 and B3 customers from the fourth access arrangement period in the fifth access arrangement period. The Authority rejected ATCO's proposed revenue yield price control for B2 and B3 customers in the Haulage Tariff Variation Mechanism chapter of this Draft Decision. Therefore, the Authority rejects ATCO's proposed fixed principle in clause 11.4.

1299. As set out in the Rate of Return section of this Draft Decision, the debt risk premium estimate for the first year of the fourth access arrangement period will apply over the whole of the fourth access arrangement period. To ensure that the cost of debt – arising from the annual updates of the debt risk premia in years 2 to 5 of the fourth access arrangement – is binding on ATCO, the Authority has decided to include a fixed principle clause in the revised access arrangement. The fixed principle will bind the Authority and ATCO to apply an adjustment to the debt risk premium set for the fifth access arrangement, for any differences between the regulatory debt risk premium set at the start of the fourth access arrangement, and the annually updated debt risk premia that applied in each of the second to fifth years of the fourth access

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610 ATCO Gas Australia, *Tariff Model*, September 2014.

611 WA Gas Networks Pty Ltd, *Draft Decision on WA Gas Networks Revisions Proposal for the access arrangement for the Mid-West and South-West Gas Distribution Systems*, 2010, p. 210.

arrangement. Appendix 7 of this Draft Decision sets out an approach to make this adjustment.

1300. The Authority requires that the access arrangement include an additional fixed principle as follows: "Differences between the published update of the debt risk premium, for years 2 to 5 of the fourth access arrangement, and the regulatory debt risk premium applying from July 2014 to December 2019 (the fourth access arrangement period), will be used to adjust the estimated debt risk premia applying during the years of the fifth access arrangement period. The resulting adjustment must ensure that any net revenue differences between the total approved revenue for the fourth access arrangement period, and the total revenue for the fourth access arrangement period that would have arisen with the application of the published annual updates, are accounted for in the total approved revenue for the fifith access arrangement period, in present value neutral terms."

Required Amendment 22.

The Authority requires that ATCO remove Fixed Principle 11.1 (a) and 11.1 (c).

The Authority requires that ATCO remove Fixed Principle 11.2(a).

The Authority requires that ATCO delete Fixed Principles 11.3 and 11.4 from the revised access arrangement for the fourth access arrangement period.

The Authority requires that the access arrangement include an additional fixed principle as follows: "Differences between the published update of the debt risk premium, for years 2 to 5 of the fourth access arrangement, and the regulatory debt risk premium applying from July 2014 to December 2019 (the fourth access arrangement period), will be used to adjust the estimated debt risk premia applying during the years of the fifth access arrangement period. The resulting adjustment must ensure that any net revenue differences between the total approved revenue for the fourth access arrangement period, and the total revenue for the fourth access arrangement period that would have arisen with the application of the published annual updates, are accounted for in the total approved revenue for the fifth access arrangement period, in present value neutral terms."

Other Terms and Conditions

1301. ATCO's access arrangement contains other terms and conditions which are included as annexures to the access arrangement. These terms and conditions are detailed in the System Pressure Protection Plan and Template Haulage Contract discussed below.

System Pressure Protection Plan

1302. The System Pressure Protection Plan outlines the manner in which prospective users will ensure that it does not jeopardise system pressure by not supplying enough gas at receipt points on a sub-network whilst simultaneously being unable to reduce the delivery of gas it takes at its delivery points.

Regulatory Requirements

1303. The NGR require an access arrangement proposal to detail the terms and conditions for each reference service.

> 48. Requirements for full access arrangement (and full access arrangement proposal)
>
> 1) A full access arrangement must:
>
> 2) …
>
> d) specify for each reference service:
>
> i) the reference tariff; and
>
> ii) the other terms and conditions on which the reference service will be provided; and
>
> 3) …

ATCO's Proposed Changes

1304. ATCO has not proposed any material changes to the system pressure protection plan from the current access arrangement.

Submissions

1305. The Authority has not received submissions in relation to ATCO's system pressure protection plan in the GDS access arrangement revision proposal.

Considerations of the Authority

1306. ATCO has not proposed any material changes to the Authority approved System Pressure Protection Plan, and has received no submissions in relation to it during the public consultation for the proposed revised access arrangement.

1307. The Authority has decided to approve ATCO's System Pressure Protection Plan as submitted.

Template Haulage Contract

Regulatory Requirements

1308. As noted in paragraph 1303, the NGR require an access arrangement proposal to detail the terms and conditions for each reference service.

1309. As per rule 100 of the NGR, the Authority must be satisfied that any proposed amendments to reference service terms and conditions are consistent with the NGO.

ATCO's Proposed Changes

1310. ATCO has proposed a revised template haulage contract that contains modified terms and conditions, and a large number of additional or deleted provisions.

Considerations of the Authority

1311. The Authority has reviewed ATCO's proposed revised template haulage contract, and has assessed the terms and conditions that fall under the following four categories:

- Amended provisions to improve clarity while leaving the substance of the document unchanged;
- Amended provisions that change the substantive meaning of the document in ways that do not raise concerns for the Authority, and that have not been raised in stakeholder submissions;
- Amended provisions that change the substantive meaning of the document, and that raise concerns for the Authority or that have been raised in a stakeholder submission; and
- Existing provisions that the Authority has determined to be inconsistent with the NGO.

1312. The Authority has approved ATCO's proposed amendments that fall under the first two categories above.

1313. In the following sections of this Draft Decision, the Authority sets out its consideration of issues arising from the last two categories of provisions in ATCO's proposed revised template haulage contract.

General Remarks

Commercial matters

1314. ATCO has proposed a large number of amendments that reprise terms and conditions that Western Australian Gas Networks (**WAGN**) sought during the third access arrangement review, but were rejected by the Authority in its Final Decision on the grounds that the amendments concerned commercial matters that were better left to negotiation between the parties.[612] The validity of this position was considered, among other matters, by the Australian Competition Tribunal when WAGN appealed the Authority's Final Decision.

1315. WAGN argued that the distinction between commercial and other terms was irrelevant to the NGR. The Authority made various submissions in defending its decision, including that greater prescription can impede competitive market outcomes and create inefficient outcomes. The Authority's arguments were ultimately accepted by the Tribunal, which considered the following excerpt from one of the cases raised by the Authority:

> "… terms and conditions that are more prescriptive and comprehensive may facilitate quicker access. However, against that consideration, … [must be] … balance[d] the often competing interests of the parties involved and the need not to harm competition or efficient investment by promulgating terms and conditions which can have unforeseen effects. The risk of such effects is heightened by the … [the regulator's] … comparative lack of information, knowledge and experience when measured against the expertise of the actual participants in the … industry.[613]

1316. The Tribunal's judgement confirms that the Authority can exclude from the template haulage contract matters that it considers are not relevant to the NGO. The Tribunal's judgement also emphasises the tension that exists between facilitating quicker access through greater prescription, and avoiding unforseen effects by leaving terms for negotiation. While the Tribunal's ruling confirmed that the Authority had legitimately

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612 WAGN was the previous GDS network owner.

613 *Application by WA Gas Networks Pty Ltd* (No 3) [2012] ACompT 12, paragraph 275.

exercised its judgement in not approving the disputed provision, the ruling did not preclude decisions that would strike a different balance.

1317. In this Draft Decision, the Authority has assessed many of the proposed amendments that reprise provisions that the Authority has previously rejected as concerning commercial matters. The Authority has sought to determine whether excluding these matters from the template haulage contract strikes a better balance between the competing goals of expediting access and avoiding unforeseen effects.

1318. In some cases, and with the benefit of new information, the Authority has arrived at a different conclusion about how to strike the balance between the competing goals of expediting access and avoiding unforeseen effects.

Status quo

1319. One of the arguments put forward by WAGN in its application to the Tribunal for review of the Authority's Final Decision for the third access arrangement review was that the Authority had given undue weight to the status quo.[614] The term *status quo* referred to the regulated terms and conditions in force at the time that WAGN's proposed revised access arrangement was considered.

1320. Ultimately, the service provider was not successful in making this argument. However, the Authority considers that it would be useful to illustrate the line of reasoning linking a tendency to favour the status quo with the NGO.

1321. The Authority considers that it is generally true that unforeseen effects are more likely to arise from a change to the status quo than from maintaining it. For this reason, in considering consistency with the NGO, the Authority has attached weight to the value of preserving the status quo as a means of reducing the probability of unforeseen effects. Thus, substantive amendments to the template haulage contract must be justified by benefits that the Authority considers outweigh this general advantage in maintaining the status quo.

1322. Whether the proposed revised template haulage contract preserves the status quo on a given matter is viewed by the Authority as a piece of evidence to consider when balancing the competing goals of expediting access and avoiding unforeseen effects. The Authority considers that this judgement determines whether a provision is consistent with the NGO.

Overlapping or duplicate provisions

1323. ATCO has proposed several revisions to the template haulage contract that overlap with, or potentially duplicate, other provisions of the access arrangement or other instruments governing the conduct of the parties. Examples of this include the treatment of conditions precedent, capacity trading and obligations in relation to system pressure.

1324. The Authority has a general preference to minimise the degree of overlap and duplication that occurs within the access arrangement, including the template haulage contract and across relevant instruments, such as the Retail Market Rules. This preference arises from the desire to allow rights and obligations to be interpreted as

[614] WAGN, *Application for leave and application for review of reviewable regulatory decision and grounds for review Australian Competition Tribunal No 1 of 2011*, 20 March 2011, Schedule 2, paragraph 4.

simply and unambiguously as possible. The Authority considers that overlap or duplication generally increases the risk of inconsistency and potential conflict between provisions, and makes the task of interpretation more difficult.

1325. Notwithstanding the Authority's general preference in this regard, the Authority recognises that there may be instances where it is justified to allow overlap or duplication. The Authority has considered each example of overlap or duplication on its merits and sought to establish whether the circumstances warrant an exception. For instance, if the service provider requires a particularly high level of protection against a particular risk and the Authority is satisfied that the scope for inconsistency or conflict is minimal, it might accept amendments that imposed multiple layers of protection against the same risk.

Lack of supporting argument from ATCO

1326. The Authority has not found in ATCO's proposal any reasoning or evidence to justify any of the substantive proposed amendments to the template haulage contract. In the absence of a supporting case for these amendments, it was open to the Authority to reject them on the basis that the status quo has been demonstrated to provide a workable standing access offer. This is not the approach the Authority has taken.

1327. The Authority has chosen to evaluate the purpose of and justification for each amendment in accordance with the NGO. As a result, the Authority has set out arguments for and against proposed amendments before arriving at a conclusion.

Conditions precedent

1328. In clause 1(a) of the proposed revised template haulage contract, ATCO has expanded the list of clauses to be excluded from the general principle that the contract "has no force or effect until each and all of the…conditions precedent…are satisfied or waived". The additional excluded clauses are:

- Clause 15, concerning Default and Termination;
- Clause 16, concerning Security and Insurance;
- Clause 17, concerning Liability of Parties;
- Clause 18, concerning Representations and Warranties;
- Clause 19, concerning Dispute Resolution; and
- Clause 20, concerning Notices and Addresses for Notices.

1329. In clause 1(a)(iii)(D), ATCO has expanded on an existing condition precedent, which presently requires only that the user demonstrate that it is able to deliver gas to the relevant receipt points. Pursuant to ATCO's proposed amendment, the user would be required to demonstrate that it will remain able to deliver the gas for the duration of the contract.

1330. In clause 1(d), ATCO has excluded several conditions precedent from its obligation to notify the user of the satisfaction of each condition. Among these was clause 1(a)(iv), which requires the user to have given valid security to ATCO in accordance with clause 16.2.

1331. The Authority has not received public submissions in relation to clause 1 of the proposed revised template haulage contract.

1332. During the third access arrangement review process, Alinta made a submission to the Authority on an amendment proposed by WAGN, which appears to be identical to ATCO's proposed amendment in clause 1(a)(iii)(D). Paragraph 1232 of the Authority's Draft Decision in that review noted the following:

> "Alinta submitted that the condition set out in clause 1.1(a)(ii)(E) should relate only to the status of the user's ability to deliver gas at the time for the satisfaction of the condition only and not for the duration of the haulage contract. The demonstration of future compliance is 'so difficult as to be misconceived'."

1333. In relation to clause 1(a), the Authority recognises in principle that parties to a contract may find it useful to stage that contract's entry into force. Thus, the parties can agree to become bound by some terms upon execution of the contract and then, upon the satisfaction of the conditions precedent, become bound by the remaining terms of the contract.

1334. By virtue of the operation of clause 1(a), as amended by ATCO, the parties would be bound by a wide range of provisions of the template haulage contract, prior to the satisfaction of the conditions precedent. ATCO has not explained why, prior to the satisfaction of the conditions precedent, the excluded clauses should be regarded as in-force contractual terms come into force upon execution of the contract, whereas the remaining provisions are dependent upon the conditions precedent being met.

1335. The Authority recognises that some of the additional excluded clauses must be referred to in order to evaluate whether conditions precedent have been met. However, it is not clear to the Authority what might give rise to a reasonable requirement for either party to be able to contractually enforce the excluded clauses prior to the commencement of the template haulage contract as a whole.

1336. The one matter in respect of which the Authority recognises a possible need to be able to rely on the contract prior to the conditions precedent being met is dispute resolution. The Authority recognises that disputes may arise in the interpretation of whether conditions precedent have been met. It is arguable that in such an instance, one or both parties might reasonably seek to rely on the dispute resolution process under clause 19.

1337. With the exception of the reference to clause 19, the Authority considers that it should not approve the amendment to clause 1(a), which would expand the list of clauses excluded from the effect of the conditions precedent provisions.

1338. In respect of clause 1(a)(iii)(D), the Authority notes that it previously considered and rejected an identical amendment in its review of WAGN's original proposal for the third access arrangement review. At paragraph 935 of its Final Decision for the third access arrangement review, the Authority acknowledged the "difficulty associated with a precondition for future compliance which could operate to unreasonably preclude access and operate inconsistently with the National Gas Objective".

1339. The Authority remains of the view that the amendment proposed for clause 1(a)(iii)(D) is not appropriate and the words "and will for the duration of this Haulage Contract remain," should be deleted.

1340. The proposed amendment to clause 1(d) would mean that ATCO would not be required to confirm for the user that the user had provided security in a form and manner that complied with clause 16.2. The Authority has not found any other provision of the template haulage contract that obliges ATCO to confirm that security provided by the user is considered by ATCO to conform to the requirements of clause 16.2. The

Authority considers it appropriate for ATCO to have an obligation to notify the user that the condition precedent established by clause 1(a)(iv) has been met. Accordingly, the Authority considers that clause 1(d) should be amended to delete the reference to clause 1(a)(iv).

Required Amendment 23.

Clause 1 of the proposed revised template haulage contract should be amended as follows:

(a) Other than this clause 1 and clauses ~~15,~~ 16, ~~17, 18,~~ 19, ~~20,~~ 21, 22 and 23 this Template Haulage Contract has no force or effect until…

(a)(iii)(D) <User> is~~, and will for the duration of this Haulage Contract remain,~~ able to deliver…

(d) Other than with respect to the Conditions Precedent referred to in clause~~s~~ 1(a)(ii) ~~and 1(a)(iv)~~, <Service Provider> must promptly advise …

Alignment between individual contracts and the access arrangement

1341. ATCO's proposed revised template haulage contract has required the Authority to revisit questions considered during the third access arrangement review concerning the nature of individual haulage contracts governing access to regulated services. The Authority's position on these questions has implications for its consideration of a number of ATCO's proposed revisions, in particular those relating to termination and amendment of the template haulage contract.

1342. In its Draft Decision for the third access arrangement review, the Authority characterised a user's access rights as being statutory rather than contractual in nature. The position was set out in paragraphs 1547 and 1548, as follows:

> 1547. Under the NGL and NGR, as was the case under the Code, a service provider is obliged to provide access to reference services on the terms and conditions specified in an approved access arrangement. Reference services provided by a service provider to a user, therefore, are not provided pursuant to a contractual obligation to do so, but rather a statutory obligation defined by the approved access arrangement triggered by a user making a request for access to a reference service.
>
> 1548. Under this access system the user's access right and the service provider's access obligation only operate for so long as the access arrangement remains in force. In other words, on the access arrangement expiring, or being revised (whichever comes first) the user's access rights and the service provider's access obligations cease. Such rights and obligations may, of course, be extended by a succeeding access decision.

1343. The Authority considers that its earlier characterisation of the nature of rights with respect to reference services might imply more limited scope for private negotiation than the Authority now considers to be the case. The Authority's view of these rights has developed since the third access arrangement review. This change has not affected the Authority's position on the appropriate termination or amendment rights to specify within the template haulage contract, although the Authority has followed a different line of reasoning in arriving at the same conclusion.

1344. Previously, the Authority has emphasised the need to retain alignment between private agreements for the provision of reference services and the regulated terms and

conditions provided for in the access arrangement. However, the Authority now considers that this interpretation may have the effect of restricting the scope for individual negotiation more than is intended under the NGL.

1345. There is an important difference between the terms and conditions for reference services defined by the access arrangement (of which the template haulage contract forms a part) and an executed bilateral contract. The template haulage contract is effectively a regulated standing offer, which provides a basis on which users can negotiate a contract. This standing offer is necessarily subject to amendments approved by the Authority and the requirement to offer it does not survive the expiry of the access arrangement. The bilateral contract arises when the user either accepts the standing offer or a negotiated modified offer. Thereafter, the bilateral contract retains a connection to the access arrangement only to the extent defined in that contract.

1346. A user may wish to acquire services exclusively on the terms currently defined in the access arrangement. The template haulage contract should be drafted with this notional user in mind, even though the service provider and the Authority may fully expect users to negotiate away from this starting position in their individual haulage contracts. The question for the Authority then must be which template haulage contract terms will achieve this result while placing the minimum constraint on the parties' ability to negotiate away from the access arrangement if they wish. This was the Authority's task when considering appropriate provisions covering termination and amendment in the template haulage contract.

Termination on expiry or revision of access arrangement

1347. ATCO has proposed deleting clause 2(c)(i) of the current template haulage contract, which provides that the template haulage contract will end when the Access Arrangement expires or is revised and the user does not agree to continue on the basis of different terms and conditions flowing from an access arrangement revision.

1348. If the access arrangement expires or is revised, ATCO's proposed clause 13.5(a) grants the user the right to terminate if it does not agree to a revised contract as proposed by the service provider under a change notice. Proposed clause 13.5(a) appears to have much the same meaning and effect as current clause 2(c)(i), which ATCO proposes to delete.

1349. If the access arrangement terminates or expires, unless it has made provision for how the haulage contract will terminate, proposed clause 13.5(b) grants the service provider the right to terminate.

1350. No public submissions were received in relation to the deletion of clause 2(c)(i) of the current template haulage contract, or proposed clauses 13.5(a) and 13.5(b).

1351. In its response (dated 8 October 2010) to the Authority's Draft Decision for the third access arrangement review, WAGN objected to Required Amendment 11, in accordance with which the text of 2(c)(i) was ultimately inserted into the template haulage contract. WAGN argued that the words would bind "the service provider and the user to the rights and obligations that are created by a subsequent access decision".[615]

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[615] WAGN, *Submission: Response to Draft Decision, Proposed Revisions to the Access Arrangement for the WA Gas Networks Gas Distribution System*, 8 October 2010, p. 107.

1352. In its response (dated 5 November 2010) to the Draft Decision for the third access arrangement review, Alinta objected to the Authority's and WAGN's approaches regarding variation and termination, which, Alinta claimed, overrode the normal principles of a contract. Alinta considered that it should be entitled to enter into long term haulage contracts that continue on the agreed terms and conditions regardless of revisions to the access arrangement. Alinta put the view that a user and service provider could bilaterally agree on how a haulage contract would respond to changes in an access arrangement.

1353. In its response (dated 8 October 2010) to the Authority's Draft Decision for the third access arrangement review, WAGN objected to the requirement to include clause 2(c)(i) of the current template haulage contract. WAGN had argued that clause 2(c)(i) would be inconsistent with the Authority's position about the statutory, as opposed to contractual, nature of the regulated terms and conditions. WAGN made particular mention of paragraphs 1547 and 1548 of the Draft Decision, reproduced in paragraph 1342.

1354. The Authority did not accept WAGN's argument that including clause 2(c)(i) would be inconsistent with a user's access rights being statutory in nature. Given the Authority's change of approach, WAGN's argument cannot be sustained. The user's rights will be defined within a bilateral contract and it is entirely consistent with this form of rights that the user enjoy the capacity to terminate where particular conditions are met.

1355. As noted above, the template haulage contract must be drafted in such a way that a notional user would be able to demand an individual contract that allowed the user to access services on entirely regulated terms and conditions. However, the access arrangement is subject to periodic revision and a haulage contract based on the template haulage contract would not automatically reflect those amendments. At this point, the notional user would require one of two rights to prevent being bound to terms and conditions at variance to those set out in the revised access arrangement. A right to terminate the contract upon revision to the access arrangement would allow the user to then replace the contract with a new one that was consistent with the revised access arrangement. Alternatively, provision for the automatic amendment of the bilateral contract to make it consistent with the revised access arrangement would achieve the same result.

1356. For reasons explained above, the Authority does not favour the second approach. The Authority considers that the template haulage contract must grant the user the right to terminate on revision or expiry of the access arrangement and, as such, that clause 13.5(a) is a necessary replacement for deleted clause 2(c)(i).

1357. To be clear, the Authority anticipates that in many cases the parties will negotiate the removal of clause 13.5(a) and enter into long-term haulage contracts that both parties can be confident of extending beyond a single access arrangement period. The clause is required as a starting point for that negotiation, in order to provide for the requirements of the notional user seeking access exclusively on regulated terms and conditions.

1358. For the service provider, no equivalent argument exists in favour of a right to terminate on revision or expiry of the access arrangement. In the case of access arrangement revisions, the service provider has an ongoing obligation to provide access. If it elected to terminate an agreement for the provision of reference services, this would simply see the user making a fresh application for access. In the case of access arrangement expiry, the need for a default termination right for the service provider is not clear to the Authority either. A long dated contract would be likely to require extensive

negotiation by the parties in any event. In the case of a contract covering only an access arrangement period, the commercial risks arising the remote possibility of mid-period expiry do not appear sufficient to warrant a general right to terminate. Clause 13.5(b) should, therefore, be deleted.

1359. The Authority does not see benefit in clauses 13.5(c) and 13.5(d) that merely commit the parties to enter into good faith negotiations. The provisions appear unenforceable and should therefore be deleted.

Required Amendment 24.

Clauses 13.5(b), 13.5(c) and 13.5(d) of the proposed revised template haulage contract should be deleted.

Effect of future changes to the access arrangement

1360. ATCO has proposed three new clauses in 13.2, 13.3 and 13.4, which describe how the haulage contract signed by the parties will be amended consequent to amendments to the access arrangement.

1361. Proposed clause 13.2 sets out a procedure for the service provider to determine whether to modify the haulage contract in response to changes to reference services and provides for the user's right to challenge the service provider's interpretation of the changes required to the access arrangement.

1362. Proposed clause 13.3 asserts that the haulage contract will be amended to reflect changes to the terms and conditions of the access arrangement and specifies a mechanism to this end.

1363. Proposed clause 13.4 provides that clauses 13.2 and 13.3 apply on each revision of the Access Arrangement.

1364. No public submissions were received in relation to clauses 13.2, 13.3, 13.4 and 22.3.

1365. In its response (dated 19 April 2010) to the Authority's issues paper for the third access arrangement review, Alinta made several points on clauses very similar to clauses 13.2, 13.3, and 13.4. Alinta argued that:

- A clause equivalent to clause 13.4 was an unacceptable and unilateral interference with contractual rights.
- Clauses equivalent to 13.2 and 13.3 should only operate where the Pipeline Services are sufficiently similar for the new or varied Pipeline Service to be able to operate within the existing terms and conditions.
- Amendments to the access arrangement are initiated by the service provider, which must take into account the existing contractual rights of users when planning new pipeline services or proposing variations to existing pipeline services.
- If terms and conditions needed to be modified to accommodate varied or new pipeline service, the service provider should have to seek the agreement of users.

1366. In its response (dated 8 October 2010) to the Authority's Draft Decision for the third access arrangement review, WAGN noted that the NGL (WA) and NGR do not expressly confirm the relationship between an access arrangement and agreements

between users and the service provider. WAGN also argued that the proposed terms (equivalent to clauses 13.2, 13.3, and 13.4) would provide certainty by making the effect of a change to the access arrangement explicit.

1367. The Authority notes that WAGN had proposed similar amendments to those now proposed by ATCO in the form of clauses 13.2 to 13.4 of the proposed revised template haulage contract. In the Final Decision for the third access arrangement review, the Authority disallowed those similar amendments, having concluded that reference services are provided to a user not pursuant to a contractual obligation but a statutory obligation defined by the access arrangement.

1368. As explained above, the Authority has adjusted its position on the ability of parties to structure individual contracts for reference services in ways that differ from the terms and conditions approved in the access arrangement.

1369. The Authority now accepts that it is permissible under the NGL for a clause of the template haulage contract to specify whether and how the contract should be amended. This does not imply that clauses 13.2 to 13.4 of the proposed revised template haulage contract are necessarily consistent with the NGO. In other words, the Authority is satisfied that the template haulage contract can be drafted to provide for its own amendment, but is not persuaded that it should.

1370. Changes to an access arrangement can result in substantial changes to reference service pricing, and terms and conditions. In view of this, the Authority considers it highly desirable for the parties to share a common understanding of how those changes will affect the individual haulage contract.

1371. The Authority notes that the regulated terms and conditions for Victorian distributors Multinet and SP Ausnet do explicitly address this issue. In those instruments, it is taken to be the intention of the service provider and the user that the terms of their contract will reflect the regulated terms approved in the access arrangement. Further, the parties agree that changes to the regulated terms are to be automatically reflected in the bilateral contract, subject to any contrary written agreement or exclusion clauses adopted by the parties.

1372. The Authority expects that users and the service provider will recognise that the access arrangement will change in the future, and will contractually define how this would affect the service agreement. Different parties may seek different arrangements to respond to changes to the access arrangement.

1373. If the parties are unable to agree on a mutually acceptable provision to do this, then it is open to the user to rely on the termination rights provided by proposed clause 13(a) (replacing current clause 2(c)(i)) in the event of an amendment. The user can then rely on the fact that they will be entitled to a new service agreement on the terms and conditions of the approved revised access arrangement.

1374. The Authority wishes to encourage the parties to explicitly consider and define, in light of their individual requirements, how the haulage contract will be affected by changes in an access arrangement. The Authority, therefore, declines to approve a default position on this question but requires that the template haulage contract be amended to flag the matter for consideration by parties negotiating a haulage contract. Accordingly, the Authority requires clauses 13.2, 13.3 and 13.4 to be deleted and for clause 22.3 to be amended to include a placeholder for the parties to set out the consequences of revisions to the access arrangement for the haulage contract.

Required Amendment 25.

Clauses 13.2, 13.3 and 13.4 of the proposed revised template haulage contract should be deleted.

Clause 22.3 of the proposed revised template haulage contract should be amended as follows:

> 22.3 Amendment
>
> This Haulage Contract may only be amended:
>
> (a) In the absence of revisions to the access arrangement, by written agreement of the Parties; or
>
> (b) where the access arrangement has been revised, [User and Service Provider to insert agreed terms for the amendment of the haulage contract upon revision of the access arrangement].

Effect of "Regulatory Events"

1375. ATCO has proposed clause 13.6, setting out a process whereby the service provider may advise the user of changes to the haulage contact that it considers necessary to respond to a regulatory event. Regulatory event is defined as a change to a law or the Retail Market Scheme that affects the operation of the haulage contract.

1376. No public submissions were received in relation to clause 13.6.

1377. In its response (dated 8 October 2010) to the Authority's Draft Decision for the third access arrangement review, WAGN argued that the Authority had erred in concluding that that the terms of the Template Haulage Contract are unaffected by a change in law. WAGN also argued that the Authority had confused the concept of complying with a change in law, which a service provider and user must do and whether WAGN is entitled to a variation to the reference tariffs because of the change in law. Further, WAGN cited the precedent of a clause approved by the AER for the gas distributor serving the Wagga Wagga area. Under that clause, the parties acknowledged that changes to laws might require changes to the contract and agreed to negotiate any necessary amendments in good faith.

1378. In its response (dated 8 November 2010) to the Authority's Draft Decision for the third access arrangement review, Alinta supported the Authority's decision to require the deletion of a similar clause to clause 13.6.

1379. The Authority notes the arguments raised by WAGN following the Draft Decision for the third access arrangement review in support of a similar clause to 13.6 of the proposed revised template haulage contract. However, these arguments did not address the grounds on which the Authority disallowed the clause.

1380. The Authority's objection to the clause was that it purported to grant to the service provider the power to amend the terms and conditions for access to reference services. In the Authority's view, the only avenue open to the service provider to obtain such a change would be to submit an access arrangement variation proposal under rule 65 of

the NGR (see paragraph 1228 of the Final Decision for the third access arrangement review).

1381. As noted, the Authority now accepts that it is permissible, under the NGL (WA), for the template haulage contract to describe terms on which one or other of the parties may amend their haulage contract. This leaves open the question of whether ATCO's proposed clause 13.6 is consistent with the NGO.

1382. The parties may realise at a future point that the template haulage contract is inconsistent with a law or with the Retail Market Scheme. This could eventuate not only because of a change of law, but also because an existing law was overlooked when the document was approved. The Authority notes that clause 2 of the regulated terms and conditions for the Victorian gas distributors Multinet and SP Ausnet specifies the effect of inconsistency with a regulatory instrument. Clause 2 for these Victorian distributors also confirms that the parties will comply with regulatory instruments, notwithstanding any of the obligations imposed by the contract.

1383. The Authority considers that clause 2 of the terms and conditions for Multinet and SP Ausnet grants those service providers and their users the minimum flexibility necessary to manage conflicts between contractual and regulatory requirements. Clause 13.6 of the proposed revised template haulage contract goes considerably further than the inconsistency provisions approved for Multinet and SP Ausnet.

1384. In designing a clause like clause 13.6, which allows for a contract to be adjusted in response to an unspecified future change in circumstances, it is difficult to avoid unforeseen effects. The Authority would expect that, in negotiating a clause of this kind, the parties may identify particular risks associated with regulatory changes that they wish to mitigate. Consequently, the Authority considers that the parties are likely to be in the best position to determine whether and how adjustments for regulatory events should be provided for.

1385. The Authority considers that clause 13.6 should be deleted. However, it is satisfied that it would be consistent with the National Gas Objective to make clear that the parties' contractual obligations are over-ridden by laws (including subordinate legislation), to the extent of any inconsistency. The Authority considers that clause 2 of the terms and conditions for Multinet and SP Ausnet provides a suitable template for providing this certainty.

Required Amendment 26.

Clause 13.6 of the proposed revised template haulage contract should be deleted and replaced with the following provision:

13.6 Laws to take precedence

(a) In the event of any inconsistency between:

(i) a party's obligations or rights under a Law; and

(ii) its obligations or rights under this Haulage Contract,

its obligations and rights under the Law shall take precedence to the extent of the inconsistency.

(b) Where this Haulage Contract contains provisions which regulate a matter in greater detail than the provisions of a Law then the provisions of this Haulage Contract will not be taken to be inconsistent merely by reason of the inclusion of that additional detail and the provisions of this Haulage Contract will continue to apply to that matter to the extent permitted by the terms of the Law.

User obligations in relation to maintaining system pressure

1386. ATCO has proposed amendments to the template haulage contract that relate to the obligations of parties with respect to maintaining gas pressure within specifications.

1387. In clause 5.3, ATCO has introduced the requirement for the parties to comply with rule 182 of the Retail Market Rules in relation to system pressure in a sub-network. As explained by ATCO, rule 182 requires users to collectively keep the sub-network pressurised, with responsibility falling on each user proportionally to that user's aggregate gas withdrawals on a given day.

1388. In clause 6.8, ATCO introduces a new obligation on the user to use reasonable endeavours to ensure that the gas delivered to a receipt point does not exceed the physical design capabilities of the meter at that point.

1389. These proposed new requirements are in addition to the existing requirements on users for gas balancing, which are retained in the proposed revised template haulage contract at clause 6.7.

1390. No public submissions were received in relation to clauses 5.3 or 6.8.

1391. The Authority notes that it is currently the case that where a user fails to comply with rule 182 of the Retail Market Rules, these Rules provide for penalties and grant powers to order compliance. Under Part 6.3 of the Retail Market Rules, if a participant, pipeline operator or prescribed person (notifying party) reasonably believes that a user has breached the Rules, then the notifying party may give a notice to Retail Energy Market Company (**REMCo**) specifying the details of the alleged breach. Pursuant to rule 328A, REMCo may then investigate the alleged breach and, if it determines the matter

was material, refer the matter to the compliance panel for a determination under clause 343. Pursuant to rule 343, amongst other things, the compliance panel may:

- impose a financial penalty on a user of up to $50,000 in respect of each breach of the rules;
- order a user to take action, or cease action to comply with an earlier order of the compliance panel.

1392. The Authority further notes that rule 345 of the Retail Market Rules (**Rules**) provides that nothing in Chapter 6 of the Rules limits a participant's, pipeline operator's, prescribed person's or REMCo's right to litigate, arbitrate or otherwise seek to resolve, any dispute. Consequently, a network operator may have a right to commence civil proceedings for damages against a user for a breach of rule 182 in circumstances where it can be shown, on the balance of probabilities, that the breach actually caused loss to the network operator.

1393. The fact that a user is subject to the compliance mechanism under the Retail Market Rules and the fact that ATCO may also be able to sue for damages arising from a breach of rule 182, should provide ATCO will considerable comfort regarding user compliance.

1394. The Authority does not consider it necessary to grant ATCO the additional protection of an express contractual obligation on the user, enforceable by way of an action for damages for breach of contract. Further, the Authority considers that clause 5.3(b) would potentially undermine the statutory enforcement regime set out in the Rules under which potential breaches are investigated and determined by regulatory bodies rather than participants. Finally, the Authority does not wish to create a risk of inconsistency or potential conflict between the provisions in the Rules and the template haulage contract.

1395. For the reasons set out in paragraphs 1323 to 1325, the Authority has a general preference to avoid overlaps of the kind that would arise from the inclusion of proposed clause 5.3(b). The Authority has not identified any particular factors that would offset this general preference.

1396. Accordingly, the Authority requires that clause 5.3(b) of the proposed revised template haulage contract be deleted.

Required Amendment 27.

Clause 5.3(b) of the proposed revised template haulage contract should be deleted.

Deregistration of Delivery Points

1397. ATCO has proposed an amended clause 5.6, which requires the service provider to deregister a delivery point under certain conditions. This would replace the current requirement for the service provider to give notice specifying the procedure for deregistration point, while leaving it for the user to request deregistration.

1398. No public submissions were received in relation to clause 5.6.

1399. The Authority understands that ATCO's proposed clause 5.6 would require the service provider to automatically deregister a delivery point when the end date for that delivery

point has been reached. In addition to removing the requirement for the user to request deregistration, this change would also remove the liability currently borne by users to pay any charges or fees payable in respect of the delivery point.

1400. In the absence of any objections from users, the Authority considers the proposed change to be acceptable. However, if this amendment is to occur the Authority considers that the following clauses would need to be revised for consistency: Schedule 1, clause 9(a); Schedule 2, clause 9(a); Schedule 3, clause 8(a); Schedule 4, clause 7(a); and Schedule 5, clause 7(a).

1401. The consideration of deregistration processes has brought to the Authority's attention a separate issue regarding liabilities in the event of a failure to deregister a delivery point. Schedule 1, clause 9(c); Schedule 2, clause 9(c)(i); Schedule 3, clause 8(d); Schedule 4, clause 7(c); Schedule 5, clause 7(c) all absolve the service provider of liability in the event of a failure to permanently deregister a delivery point.

1402. The meaning of Schedule 1, clause 9(c) and its equivalents in subsequent schedules is ambiguous, because of the use of the pronoun "it". In those clauses, it is not entirely clear whether "it" refers to the service provider or the user. However, it may be inferred that it is a reference to the service provider, since only the service provider can actually deregister a delivery point and, by extension, fail to deregister one.

1403. Schedule 1, clause 9(c) and its equivalents have not been materially amended in the proposed revised template haulage contract. These clauses may have been considered appropriate in the context of the current deregistration process, which requires the user to take a positive step before the service provider is required to deregister the delivery point. Given the revised, simplified deregistration process that ATCO has proposed in clause 5.6, the Authority considers that it is no longer appropriate to exclude liabilities on the service provider arising from its failure to deregister a delivery point. Accordingly, the Authority considers that Schedule 1, clause 9(c); Schedule 2, clause 9(c)(i); Schedule 3, clause 8(d); Schedule 4, clause 7(c); Schedule 5, clause 7(c) should be deleted.

Required Amendment 28.

Schedule 1, clause 9(a); Schedule 2, clause 9(a); Schedule 3, clause 8(a); Schedule 4, clause 7(a); and Schedule 5, clause 7(a) should be revised to ensure consistency with clause 5.6 of the proposed revised template haulage contract.

Schedule 1, clause 9(c); Schedule 2, clause 9(c)(i); Schedule 3, clause 8(d); Schedule 4, clause 7(c); Schedule 5, clause 7(c) should all be deleted.

Gas quality specifications

1404. ATCO has proposed amendments in the proposed revised template haulage contract concerning the rights and obligations of the parties with respect to the setting of, and adherence to, gas quality specifications.

1405. In clause 6.2, ATCO has introduced a right for itself to unilaterally amend the gas quality specifications, subject to following notification requirements and the need to maintain consistency with any law.

1406. In clause 6.5, ATCO has sought to allocate most of the risk in relation to damage arising from off-specification gas to the user. The proposed wording requires the user to relinquish all claims against the service provider and to indemnify the service provider against damage to itself and against claims brought by third parties against the service provider.

1407. In clause 6.6, ATCO has sought to ensure that it retains the discretion to convey off-specification gas where it "reasonably believes that the conveyance is necessary for the safety or protection of persons or property". At 6.6(b), the clause goes on to preclude service provider liability for damage to the user arising "in relation to or connection with such conveyance".

1408. Kleenheat noted in its submission that clause 6.5 (among other clauses) could significantly increase the risk to the user. Kleenheat requested that the Authority ensure that the allocation of risk under the proposed revised template haulage contract was fair and reasonable.

1409. In respect of clause 6.2, the Authority has not been persuaded that it is either necessary or appropriate for ATCO to have a unilateral right to amend the gas quality specifications.

1410. Accordingly, the Authority considers that clause 6.2 should be deleted.

1411. The Authority considers that users possess limited power to modify the gas specifications that suppliers are required to meet. Gas is a bulk commodity and the composition of gas injected at a receipt point on ATCO's network is a function of the commingled output of gas injected into the transmission system at the various production facilities. In view of this, the Authority considers that changes to gas specification requirements require careful and coordinated consideration across the industry, rather than unilateral judgements made by a single gas distribution service provider.

1412. Clause 6.5 appears to entirely unburden ATCO of all liabilities with respect to damage arising from the conveyance or delivery of off-specification gas. The question of whether it is appropriate for ATCO to be indemnified against indirect damage to itself is considered at paragraph 1428 to 1433. However, clause 6.5 raises issues additional to the appropriate scope of damages to be covered by indemnities. Hence, the clause is also discussed here.

1413. Clause 6.5, as proposed, would have the effect of shielding the service provider from the consequences of its negligence or default in respect of the delivery of off-specification gas where this would otherwise attract liability under clause 17.1. One might take the view that because ATCO cannot control the quality of gas in its network, it could not itself cause damage through the delivery of this off-specification gas. If this were the case, it would be difficult to see why ATCO required a provision precluding its own liability in such circumstances.

1414. The Authority is not prepared to rule out the possibility of ATCO's negligence or default giving rise to damage in a situation where others are responsible for gas being off-specification. ATCO might owe users a general obligation to keep pace with standard industry practice in terms of monitoring gas quality and, at some point, failure to do so might be considered negligent and liabilities for damage might reasonably apply. ATCO might deliver off-specification gas at an unacceptably high or low pressure and if damage to the user arose on account of the delivery pressure, ATCO should not be excused from its negligence or default on account of the composition of the gas.

1415. ATCO might owe users a general obligation to keep pace with standard industry practice in terms of monitoring gas quality and, at some point, failure to do so might be considered negligent and liabilities for damage might reasonably apply. ATCO might deliver off-specification gas at an unacceptably high or low pressure and if damage to the user arose on account of the delivery pressure, ATCO should not be excused from its negligence or default on account of the composition of the gas.

1416. In view of the above, the Authority is not persuaded that the scope of clause 6.5 is appropriate. Accordingly, the Authority requires clause 6.5 to be redrafted to ensure that ATCO retains liabilities for harm arising from its exercise of that discretion.

1417. Clause 6.6(a) appears to the Authority to be a reasonable provision to ensure that ATCO retains discretion in how it manages operating risk. However, the Authority considers that clause 6.6(b) is too broad in protecting ATCO from liability arising from the conveyance of off-specification gas.

1418. The Authority considers that ATCO's general liability for damage arising from its own negligence or defaults should be limited as specifically as possible and only where appropriate. A more specific and appropriate limitation to ATCO's risk under the circumstances contemplated in clause 6.6(b) would be one that focused on limiting its liability for any damage arising from the fact that the gas was off-specification.

1419. Consistent with the Authority's approach to clause 6.5, the service provider should retain liability for damage that arises under the circumstances contemplated in 6.6(a), but which is caused by problems other than the composition of the gas. If the service provider has exercised its discretion under clause 6.6(a) in a negligent manner, then it should be subject to the general liability provisions set out in clause 17. The example of damage arising from a cause other than the composition of the gas (see paragraphs 1412 to 1414) is also relevant in relation to clause 6.6(b).

1420. The Authority requires clause 6.6(b) to be redrafted to include the qualification "where the loss, damage, cost or expense is a result of the gas being Off-specification Gas".

Required Amendment 29.

Clause 6.2 of the proposed revised template haulage contract should be deleted

Clause 6.5 of the proposed revised template haulage contract should be redrafted to ensure that ATCO retains liabilities for harm that arises from its own negligence or default.

Clause 6.6 of the proposed revised template haulage contract should be amended as follows:

> (b) <Service Provider> will have no liability to <User> for any loss, damage, cost or expense <User> suffers or incurs in relation to or connection with such conveyance, <u>where the loss, damage, cost or expense is a result of the gas being Off-specification Gas</u>.

Liability for indirect damage

1421. ATCO has proposed a variety of amendments relating to liabilities for damage.

1422. There are numerous amendments proposed to the general liability provisions contained in clause 17 of the proposed revised template haulage contract. However, these amendments appear to leave undisturbed two important pre-existing principles, namely that in general:

- parties will be liable to one another for direct damage arising from their own negligence or default (clause 17.1); and
- parties will not be liable to one another for any indirect damage, unless the template haulage contract specifically provides otherwise (clause 17.3).

1423. ATCO has proposed new clauses and amendments to existing clauses to impose liabilities on the user for indirect damage in specific circumstances, namely:

- off-specification gas (clause 6.5(a));
- gas balancing (clause 6.7(b));
- maximum pressure (clause 6.8(b)); and
- failure to comply with instruction during Emergencies (clause 6.11(e)(ii)).

1424. ATCO has proposed a new clause 18.3(b) by which selected user representations and warranties would give rise to liabilities for indirect damage.

1425. Kleenheat has noted in its submission that clauses 6.5, 6.7(b), 6.8(b) and 6.11(d) could significantly increase the risk to the user, and has requested that the Authority ensure that the allocation of risk under the proposed revised template haulage contract is fair and reasonable.

1426. In its submission, Alinta made a general remark about the liability provision (clause 17). Alinta considered that the clause was too broad, and did not allocate liability where the risk is best controlled. Alinta stated on page 9 of its submission that "all of the liability is placed on the user whereas Alinta considers the Service Provider is the party best able to control the risk."

1427. The Authority also notes that Alinta provided a submission to the Authority during the third access arrangement review of the GDS access arrangement, dated 19 April 2010. At paragraph 1361 of its Draft Decision in that review, the Authority noted that Alinta had expressed concern about a similar amendment to extend the user's liabilities to include indirect damage. Alinta had argued that users should not be liable for indirect loss or damage under this clause.

1428. ATCO has offered no explanation for why it considers a modified allocation of liabilities is appropriate. Kleenheat's submission encouraged scrutiny of this issue without offering any views on how the Authority should decide the matter. Alinta's submission offered little guidance on how risk should be allocated in the case of the five specific clauses that introduce liability for indirect damage.

1429. In respect of 6.5(a), 6.7(b), and 6.8(b), the Authority notes that the regulated terms and conditions for Victorian distributors Multinet and SP Ausnet provide a precedent for imposing liability for indirect damage on users for similar types of failures to those contemplated in these three clauses proposed by ATCO.

1430. The Authority notes that the regulated terms and conditions for Victorian distributor Envestra do not provide for the user to be liable for indirect damage for failures of the kind contemplated by proposed clauses 6.5(a), 6.7(b) and 6.8(b).

1431. The Authority can identify no compelling reasons why the allocation of liabilities entailed by ATCO's proposed terms for 6.5(a), 6.7(b) and 6.8(b) would enhance consistency with the NGO.

1432. Uncapped indemnities, especially extending to indirect damage, can represent a significant business risk, especially where the ability of the liable party to control the risk is constrained. Furthermore, such liabilities are outside the scope of typical business insurance policies. The Authority is concerned that the risks and liabilities inherent in ATCO's proposed terms for 6.5(a), 6.7(b) and 6.8(b) are of this kind. The Authority is very reluctant to impose on either party uncapped indemnities covering indirect damage, especially where the liable party lacks complete control of the risk and where the liabilities must be insured against.

1433. Given the concerns set out above, the Authority requires that clauses 6.5(a), 6.7(b) and 6.8(b) be amended to remove references to indirect damage.

1434. In respect of ATCO's proposed clause 6.11(e)(ii), the Authority notes that Required Amendment 20 of its Draft Decision for the third access arrangement review removed terms that made the user liable for indirect damage arising from its failure to comply with instructions relating to an emergency. The Authority had not identified any reason to disturb the pre-existing liability arrangements, and noted the opportunities for the parties to negotiate modified liability allocations if they saw fit. The Authority maintained this position in its Final Decision.

1435. The Authority has given special consideration to the issues surrounding proposed clause 6.11(e)(ii), in light the additional importance of obligations relating to emergencies. The Authority acknowledges that it may be reasonable to attach a special priority to the compliance by users with ATCO's instructions in an emergency. Extending the user's liability to include indirect damage would provide an additional incentive for users to comply. Further, the Authority considers that users would be expected to be able to comply with the service provider's reasonable instructions, meaning users would have a high degree of control over the commercial risks arising from clause 6.11(e)(ii).

1436. While the Authority recognises the desirable incentives that would be provided by proposed clause 6.11(e)(ii), the same insurability concerns arise as in relation to 6.5(a), 6.7(b) and 6.8(b). Users must have insurances to cover their liabilities, yet clause 6.11(e)(ii) would impose a liability that users may not be able to insure, which may impede access. Accordingly, the Authority requires that clause 6.11(e)(ii) be amended to remove the reference to indirect damage.

1437. Considering the issue anew, the Authority notes that where it is desirable to spur one party's compliance with a particular contractual term, the allocation of liabilities arising from a failure to comply with the term offers a potential incentive to this end. The Authority acknowledges that it may be reasonable to attach a special priority to the compliance by users with ATCO's instructions in an emergency. Extending the user's liability to include indirect damage would provide an additional incentive for users to comply. Further, the Authority considers that users would be expected to be able to comply with the service provider's reasonable instructions, meaning users would have a high degree of control over the risks arising from clause 6.11(e)(ii).

1438. Notwithstanding the points set out in paragraph 1435, the same insurability concerns arise as in relation to 6.5(a), 6.7(b) and 6.8(b). Users must have insurances to cover their liabilities, yet clause 6.11(e)(ii) would impose a liability that users may not be able

to insure, which may impede access. Accordingly, the Authority requires that clause 6.11(e)(ii) be amended to remove the reference to indirect damage.

1439. Clause 6.9(c)(ii) in the proposed amended template haulage contract has retained a pre-existing requirement for the user to indemnify the service provider against claims for indirect damage. Consistent with its position on clauses 6.5(a), 6.7(b), 6.8(b) and 6.11(e)(ii), the Authority requires that the reference to indirect damage be removed from clause 6.9(c)(ii).

1440. The Authority does not accept ATCO's proposal to make certain user representations and warranties subject to liability for indirect damage under clause 18.3(b). The Authority considers that its amendments in this Draft Decision make this clause redundant, and that it should be deleted.

Required Amendment 30.

Clauses 6.5(a), 6.7(b), 6.8(b), 6.9(c)(ii) and 6.11(e)(ii) of the proposed revised template haulage contract should be amended to remove references to indirect damage.

Clause 18.3(b) should be deleted.

Delivery facilities maintenance and operation

1441. ATCO has proposed an amendment to clause 7.7(d)(ii), replacing the phrase "in the reasonable course of", with the phrase "acting reasonably in the course of".

1442. The Authority has not received any public submissions in relation to clause 7.7(d)(ii).

1443. The Authority considers that ATCO's proposed amendment to 7.7(d)(ii) is likely to better reflect the intended meaning. The Authority notes that a previous use of the phrase "in the reasonable course of" in clause 7.7(a) has not been amended, and considers that the advantages of ATCO's proposed amendment to 7.7(d)(ii) are equally relevant to clause 7.7(a).

1444. The Authority accepts ATCO's amendment of clause 7.7(a) by replacing the words "in the reasonable course of" with the words "acting reasonably in the course of".

Required Amendment 31.

Clause 7.7(a) of the revised template haulage contract should be as follows:

> (b) …by <Service Provider>, or its officers, servants, or agents acting reasonably in the ~~reasonable~~ course of installing…

Service provider obligations regarding curtailment

1445. ATCO has proposed an amendment in clause 8.1, replacing the phrase "default of the user" with the phrase "User's negligence or breach of this Haulage Contract". The changes relate to a part of the clause that limits ATCO's obligation to use reasonable endeavours to minimise the magnitude and duration of any Curtailment.

1446. The Authority has not received any public submissions in relation to clause 8.1. However, Alinta noted in its submission that the service provider was best placed to determine priority for delivery of gas and advise where curtailments should occur.

1447. The Authority appreciates why ATCO would seek an exclusion in clause 8.1 to account for the user's negligence. However, the Authority considers it desirable for the service provider to always use reasonable endeavours to minimise the magnitude and duration of any Curtailment, irrespective of whether the user has been negligent.

1448. The current exclusion in clause 7.1 of the current template haulage contract relates to the user's default. The exclusion allows the service provider to exercise its rights to curtail deliveries as a remedy for the user's default, and to enforce compliance with the user's contractual obligations. The Authority does not consider that the service provider requires the same latitude in cases where the user has been negligent.

1449. The Authority considers that the service provider's obligation to use "reasonable endeavours" to minimise the magnitude and duration of curtailments will be interpreted in light of any user negligence. In other words, the standards to which the service provider would be held in assessing its response to a curtailment event may be lower if it was the user's negligence that led to the curtailment in the first place.

1450. The Authority considers that the meaning of clause 8.1 would be clearer if it made specific reference to the service provider's rights to curtail deliveries in the event of the user's default. The Authority requires the clause to be amended to remove the exclusions for negligence and breach, and instead make the service provider's obligations subject to its rights under clauses 15.5(b), 16.1 and 16.2(i).

Required Amendment 32.

Clause 8.1 of the proposed revised template haulage contract should be amended as follows:

8.1 <Service Provider> to minimise Curtailment

<Service Provider> will, in its operation and maintenance of the AGA GDS, use reasonable endeavours to minimise the magnitude and duration of any Curtailment of Gas deliveries to <User>, ~~except where the Curtailment is attributable to <User>'s negligence or breach of this Haulage Contract~~ subject to the service provider's rights to curtail deliveries under clauses 15.5(b), 16.1 and 16.2(i).

Disputing invoices and past payments

1451. ATCO has proposed clause 10.3, setting out the rights, obligations and processes that apply when the user disagrees with an invoice prior to payment. The process ultimately invokes the dispute resolution processes provided for in clause 19. In turn, clause 19 imposes minimum thresholds for the activation of the dispute resolution provisions therein. For instance, claims in respect of a single line item must be greater than $5,000 in value.

1452. ATCO has also proposed clause 10.4, setting out the rights, obligations and processes that apply once an invoice has been paid, if either party subsequently forms the view that a past payment was incorrect. The process differs depending on who claims the

error. Clauses 10.4(b) and 10.4(c) specify the process for the user to claim an error in a past payment, with ultimate recourse to clause 19. Clause 10.4(d) specifies the process for the service provider to claim an error in a past payment, but makes no provision for the user to challenge that claim.

1453. Kleenheat objected in its submission to the apparent imposition of *"de minimis*" limits on a user's ability to challenge an invoice when reading clause 10.3(d)(ii) with 19.1(c). Kleenheat considered this to be an unacceptable limitation to its right to dispute payments in this circumstance.

1454. Kleenheat also claimed that Clause 10.3(b) appeared to be inconsistent with Clause 10.4. Kleenheat argued that the former clause implies that the user is barred from subsequently disputing an incorrect payment claim and that the latter allows for an error to be corrected at a later date. Kleenheat sought to have the provisions reviewed to remove ambiguity.

1455. Clauses 10.3 and 10.4 of the proposed revised template haulage contract reprise similar provisions sought by WAGN during the third access arrangement review. The Authority disallowed much of this detail on the grounds that the proposed amendments concerned commercial matters better left to commercial negotiation.

1456. The Authority notes that the regulated terms and conditions for the Victorian gas distributors Envestra, Multinet and SP Ausnet all provide in a reasonable level of detail for the parties to challenge and seek correction of payment claims, both before and after payment.

1457. The Authority considers that the parties are likely to wish to specify in their haulage contracts clear processes for resolving payment disputes. Accordingly, the Authority has not rejected ATCO's proposal to include additional detail on these matters in the proposed revised template haulage contract at clauses 10.3 and 10.4.

1458. The Authority notes Kleenheat's comments about an apparent inconsistency between clauses 10.3(b) and 10.4, but disagrees with Kleenheat's interpretation. The Authority does not accept Kleenheat's objection that clauses 10.3(b) and 10.4 create ambiguity. On the Authority's interpretation, the effect of clause 10.3(b), in conjunction with 10.3(a) is to make the user's right to dispute an unpaid invoice, or part thereof, subject to time constraints and a notification procedure. Where the user has not availed itself of the rights granted under 10.3(a), in the manner provided for in that clause, then it must pay the invoice in full, by virtue of 10.3(b) and 10.2.

1459. Subsequent to paying an invoice, the user can object to that payment by issuing a retrospective error notice under clause 10.4. The practical difference between the processes provided for by clauses 10.3 and 10.4 is clear. In the case of the former, the objection is dealt with before ATCO receives the payment in question. In the case of the latter, ATCO retains the past payment until the objection is resolved and it may then refund some portion of that payment.

1460. The Authority has other concerns about clauses 10.3 and 10.4 which are discussed below.

1461. Under both clauses 10.3 and 10.4, where the user claims a charging or payment error that is not accepted by ATCO, the matter can be referred to a dispute resolution procedure specified in clause 19. However, as noted by Kleenheat, 19.1(c) imposes limits that may see some user claims disregarded. These claims would regard either erroneous charging under 10.3 or erroneous payment under 10.4.

1462. The Authority agrees with Kleenheat that it is not desirable to limit a user's ability to challenge invoices with a threshold minimum value, such as would be applied through clause 19.1(c). The Authority considers that ATCO should have an incentive to ensure all invoices are accurate. By limiting the user's ultimate ability to sustain a challenge to an invoice, the thresholds imposed by clause 19.1(c) will operate to limit that incentive for ATCO.

1463. The Authority agrees with the application of the threshold limits imposed by clause 19.1(c) in the case of disputed past payments. The Authority considers that a user should have an incentive to assess the accuracy of invoices in an effective and timely manner. Assuming the proposed revised template haulage contract is modified such that 19.1(c) does not apply in the case of 10.3, but continues to apply in the case of 10.4, the user will have such an incentive. The user would have the ability to sustain a challenge to relatively minor errors in invoices, but only if it raised the objection at the invoicing stage, rather than in the post payment context.

1464. Accordingly, the Authority requires that the proposed revised template haulage contract to be amended such that the threshold limits imposed under 19.1(c) do not apply to invoice disputes arising under clause 10.3.

1465. The Authority is concerned that clause 10.4 creates an unreasonably asymmetrical set of rights for the parties. In the event that an error in past payments was identified, the user could raise this with ATCO in accordance with clauses 10.4(b) and 10.4(c), while the process for ATCO is described in clause 10.4(d). Where the user claims a payment error, 10.4(c) permits ATCO to reject this, leaving the user recourse to arbitration under clause 19. By contrast, where ATCO claims a payment error, 10.4(d) merely provides for the user to be notified of the value of the error and the accrued interest. This appears to imply that ATCO would have the right to insist on the correction of the notified payment error.

1466. The Authority has not identified any justification for granting ATCO superior rights with respect to claiming, and insisting on the correction of, past payment errors. It seems to the Authority that both parties should have similar incentives to avoid protracted disputes, leading to a tendency to limit formal dispute resolution to serious matters. Given this, the Authority considers that a user would be expected to responsibly exercise a right to reject ATCO's retrospective error notices and thereby force a past payment dispute to formal dispute resolution under clause 19.

1467. Accordingly, the Authority requires clause 10.4 to be amended such that the same processes, rights and obligations applicable to user-issued retrospective error notices will apply for retrospective error notices issued by the service provider.

Required Amendment 33.

Either clause 10.3 or clause 19.1(c) of the proposed revised template haulage contract should be amended such that the threshold limits imposed under 19.1(c) do not apply to invoice disputes arising under clause 10.3.

Clause 10.4 of the proposed revised template haulage contract should be amended such that the same processes, rights and obligations applicable to user-issued retrospective error notices provided for under 10.4(b) and 10.4(c) will apply for retrospective error notices issued by the service provider.

Taxes generally and GST

1468. ATCO has proposed clause 11.1(a), establishing the user's liability for all taxes relating to the transfer of title to gas at a receipt point or a delivery point, in addition to any taxes arising in relation to delivery, transportation or handling of gas outside of the GDS. Clause 11(b) would make the service provider liable for taxes arising in relation to pipeline services provided within the GDS.

1469. ATCO has also proposed clause 11.2, specifying rights, obligations and processes relating to the payment of GST.

1470. ATCO has proposed a new clause 22.5, concerning liability for duties and legal costs.

- Clause 22.5(a) would make the user liable for all duty payable on or in connection with the haulage contract or subsidiary instrument or payable on transactions effected under the contract.
- Clause 22.5(b) states that each party must bear its own costs associated with preparing the haulage contract.

1471. No public submissions were received in relation to clause 11 or clause 22.5.

1472. The Authority notes Alinta's submission on 5 November 2010, in response to the Authority's Draft Decision for the third access arrangement review. At page 12 of Annexure C of that response, Alinta stated that it supported the Authority's decision to require deletion of an equivalent clause to ATCO's proposed clause 11.1. However, Alinta indicated that a clause equivalent to 11.2 seemed appropriate, since the reference tariffs are GST exclusive.

1473. When a clause similar to clause 22.5(a) was required to be removed by the Authority in its Draft Decision for the third access arrangement review, in its submission dated 8 October 2010, WAGN provided arguments in favour of retaining it.

1474. WAGN submitted that its reference tariffs had been calculated exclusive of any stamp duty that may be payable on the template haulage contract. It argued that it should have the opportunity to recover the efficient cost of providing the reference services, including any duties incurred as a result of the haulage contract (pages 133-134).

1475. The Authority notes that similar provisions to clauses 11.1 and 11.2 of the proposed revised template haulage contract were proposed by WAGN during the third access arrangement review. These provisions were rejected by the Authority on the grounds that they concerned commercial matters better left to be negotiated between the parties.

1476. The Authority considers it likely that clause 11.1 has been drafted with an eye to possible future duties or taxes. The Authority is concerned that clause 11.1 is broad in its scope. Consequently, the Authority remains unconvinced that clause 11.1 strikes a suitable balance between delivering expedient network access and avoiding unforeseen effects, and requires clause 11.1 to be removed.

1477. The Authority notes that the regulated terms and conditions for the Victorian gas distributors Envestra, Multinet and SP Ausnet all specify how GST is to be handled in respect of services provided under regulated haulage contracts. The Authority is also mindful of Alinta's support, expressed during the third access arrangement review, for the provisions proposed by WAGN to specify the treatment of GST under the template haulage contract.

1478. Given its focus on a specific tax, the fact that reference tariffs do not make allowance for GST, the precedents that exist in Victoria and the support expressed by Alinta in 2010, the Authority is satisfied that clause 11.2 is consistent with the NGO.

1479. In respect of clause 22.5(a) of the proposed revised template haulage contract, the Authority notes the position it took in its Final Decision for the third access arrangement review on a similar provision to the proposed clause. The Authority's conclusion at that time was that potential liability for stamp duty was a matter for commercial negotiation and not for the Authority to regulate.

1480. Further, the Authority rejected WAGN's argument that the terms and conditions should ensure that the service provider could recover the efficient cost of providing the service. The Authority's view was that the revenue and pricing principles did not apply to the template haulage contract, since these terms and conditions, by definition, did not concern revenue or pricing.[616]

1481. The regulated terms and conditions for the Victorian gas distributors all specify liability to pay stamp duty payable pursuant to the contract. In the case of Multinet and SP Ausnet, the terms and conditions specify an even split of these costs between the user and the service provider.[617] Envestra's terms and conditions specify that the user is to pay all stamp duty, except where stamp duty is payable pursuant to the service provider's assignment or transfer of contractual rights or obligations.[618] Envestra's terms and conditions also list circumstances in which stamp duty may be payable, and liability to pay stamp duty falls on the user.

1482. The Authority considers that it may be appropriate for the template haulage contract to specify how specific liabilities to pay duty are to be allocated. However, as with clause 11.1, the Authority is concerned that the clause is too broad and could have unintended consequences. Of particular concern to the Authority is the phrase "all Duty that may be payable on or in connection with this Haulage Contract".

1483. The Western Australian Office of State Revenue identifies four different categories of transactions on which duty is raised, namely:[619]

- transactions over dutiable property, including land in Western Australia - transfer duty;
- certain acquisitions in a land-holding corporation or unit trust scheme - landholder duty;
- premiums paid on certain policies of insurance - insurance duty; and
- issue or transfer of motor vehicle licences - vehicle licence duty.

1484. The Authority does not consider that insurance duty or vehicle licence duty are costs that could be allocated to a specific user. The Authority understands that these costs could be characterised as having been incurred "in connection with" the haulage

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616 Economic Regulation Authority, *Final decision on WA Gas Networks Pty Ltd proposed revised access arrangement for the Mid-West and South-West Gas Distribution Systems*, 28 February 2011, paragraph 1202.

617 Multinet and SP Ausnet, *Access Arrangement Information: Part C – Terms and Conditions*, April 2013, clause 19.13(b).

618 Envestra, *Victorian Access Arrangement Annexure F General Terms and Conditions*, April 2013, clause 41.11.

619 Department of Finance, Office of State Revenue (Western Australia), "Duties", available online http://www.finance.wa.gov.au/cms/content.aspx?id=2053, accessed 31 July 2014.

contract. Some of the transactions ATCO may enter into that are liable to attract transfer or landholder duty would also be for corporate or system level purposes, and also not appropriate to allocate to a specific user. These are costs that may be regarded as having arisen "in connection with" the haulage contract.

1485. The Authority considers that clause 22.5(a) is too broad, and requires it to be amended to make its intended application clearer. The amendment should provide additional specificity about which duties are covered, and a clearer delineation of those liabilities that arise at the level of the bilateral relationship as distinct from those arising at the corporate or system level.

Required Amendment 34.

Clause 11.1 of the proposed revised template haulage contract should be deleted.

Clause 22.5(a) of the proposed revised template haulage contract should be amended to specify which duties it refers to and to ensure that the user's liability is limited to duties payable as a result of things done specifically pursuant to the bilateral relationship with the user.

Obligations if the network ceases to be a covered network

1486. If the GDS ceases to be a covered network, clause 13.5(c) requires that the parties enter into good faith discussions to renegotiate access. If the GDS subsequently becomes covered again, clause 13.5(d) requires that the parties also enter into good faith discussions to renegotiate the haulage contract.

1487. The Authority has not received any public submissions in relation to clause 13.5(c) and 13.5(d).

1488. Not only are clauses 13.5(c) and (d) of the proposed revised template haulage contract likely to be of limited benefit to either party, neither clause is within the Authority's current jurisdiction to approve.

1489. Under the NGL (WA) and the NGR, the Authority's jurisdiction to approve terms and conditions for access to reference services is limited to covered networks. Clause 13.5(c) would operate when the GDS was not a covered network. Clause 13.5(c), if approved, would have no statutory effect and has no place in the template haulage contract.

1490. Clause 13.5(d) would take effect when the GDS was a covered network, but there would have been a period of lapsed coverage. During that lapse, the Authority's power to regulate the rights and obligations of the parties would have ceased and hence the template haulage contract would expire. While the Authority's power could be restored following a subsequent coverage decision, a new template haulage contract would have to be approved. Clause 13.5(d) could only makes sense as a provision within an enduring contract, which the template haulage contract cannot be, for the reasons given.

1491. Accordingly, the Authority requires clauses 13.5(c) and (d) to be deleted.

Required Amendment 35.

Clauses 13.5(c) and 13.5(d) of the proposed revised template haulage contract should be deleted.

Capacity Trading

1492. ATCO has included new clause 14.3(c)(ii) in its proposed revised template haulage contract which provides that the service provider can withhold consent for the transfer of capacity between parties where the transferee has not complied with the service provider's conditions or requirements.

1493. No public submissions were received in relation to 14.3(c)(iii) or any other capacity trading provision.

1494. The Authority considers that the regulated preconditions for access to reference services afford the service provider considerable protections. Clause 14.3(c)(ii) of the proposed revised template haulage contract[620] already allows the service provider to insist on the transferee complying with one or more of the preconditions set out in the access arrangement. These include obligations to provide bank guarantees and to have insurances in place. Given this, the Authority is not persuaded that the service provider requires the additional protection that proposed clause 14.3(c)(iii) would provide. Accordingly, the Authority requires clause 14.3(c)(iii) to be deleted.

Required Amendment 36.

Clause 14.3(c)(iii) of the proposed revised template haulage contract should be deleted.

Novation

1495. ATCO has proposed clause 14.8, granting it the discretion to assign its rights or novate its obligations under the haulage contract on giving reasonable written notice to the user. Comparing this amendment to clause 12.6(c) of the current template haulage contract, the differences appears to be the replacement of the phrase "novate this contract" with the phrase "novate its obligations" and the addition of the phrase "assign its rights".

1496. Kleenheat expressed doubt in its submission about ATCO's supposed right under clause 14.8 to novate its obligations merely by providing written notice. Kleenheat argued that the novation of contractual obligations is supposed to require the consent of the three parties involved. These parties would be ATCO, the user and the party assuming ATCO's obligations.

1497. It appears to the Authority that ATCO's proposed replacement of clause 12.6(c) in the current template haulage contract with the clause 14.8 of the proposed revised template haulage contract was intended to clarify rather than change the meaning of

[620] This is substantially the same as clause12.3(c)(ii) in the current THC.

that provision. As the Authority understands it, the rights sought by ATCO under clause 14.8 are those it requires to ensure it can transfer a haulage contract to a new service provider in the event that it sells all or part of the GDS.

1498. The regulated terms and conditions of the Victorian gas distributors Multinet, SP Ausnet and Envestra all grant the service provider the power to pass all rights and obligations under the contract across to a replacement service provider, without requiring the consent of users. In the case of Multinet and SP Ausnet, this right is contingent on the transferee being registered as the licensed gas distributor for the relevant area (clause 19.8(b)). In the case of Envestra, it has the power to pass all rights and obligations across to a person who "purchases or acquires the Network or possession and control of the Network" (clause 39.2).

1499. The Authority does not object to ATCO retaining for itself the right to sell the GDS, free from unreasonable constraints, such as a requirement for individual user consents. The question is how the service provider's rights should be expressed. The terms and conditions for Multinet and SP Ausnet use the phrase "assign its rights and/or novate its obligations", which is similar to ATCO's proposed wording in clause 14.8. Envestra's terms and conditions use the phrase "assign or transfer its rights or obligations".

1500. A 2009 guidance note prepared by the Australian Government Solicitor (**AGS**) offers useful explanation of the contractual concepts of assignment and novation. The AGS explains novation as follows:

> "An agreement that has the effect of substituting one party for another party without changing the rights and obligations under the original agreement is called a novation. A novation gives rise to a new agreement on the same terms as the original agreement, with the original agreement being discharged. A novation is a tripartite agreement and usually takes the form of a deed executed by the original parties and the new party."[621]

1501. The AGS explains assignment as "an agreement that transfers one party's rights in a contract but not its obligations or liabilities to a third party". The AGS goes on to note that an assignment of rights under a contract, subject to contrary provisions, may occur without the consent of the other party.

1502. The AGS guidance note supports Kleenheat's contention that "novation", as typically understood in the context of contract law, involves the consent of both parties to the original contract. "Assignment", on the other hand, would normally be understood to allow for unilateral transfer in the manner ATCO clearly intends. To avoid doubt, the Authority considers that clause 14.8 should replace the term "novate" with the term "transfer".

Required Amendment 37.

Clause 14.8 of the proposed revised template haulage contract should be amended as follows:

> <Service Provider> may assign its rights or ~~novate~~ transfer its obligations under this Haulage Contract on giving reasonable written notice to <User>.

[621] Australian Government Solicitor, *"Commercial Notes: Novation and Assignment"*, Number 32, 15 July 2009, http://www.ags.gov.au/publications/commercial-notes/CN32.pdf, 15 July 2009, (accessed 4 July 2014).

Security for performance

1503. ATCO has proposed amendments to clause 16.2, modifying existing provisions and setting out rights and obligations in respect of a bank guarantee to be provided by the user.

1504. Clause 16.2(a) has been amended such that:

- user "must" provide a bank guarantee (currently ATCO has discretion to require a bank guarantee;
- bank guarantee must be "substantially in the form set out at Annexure B" (currently no form is specified); and
- value of the bank guarantee must cover three months' worth of charges (currently two months).

1505. Several new provisions have been added as follows:

- Clause 16.2(b) provides for ATCO's right to require the guarantee to be increased;
- Clause 16.2(c) provides for regular increases in the guarantee to account for CPI;
- Clause 16.2(d) spells out ATCO's right to call on the guarantee;
- Clause 16.2(e) requires the user to "top-up" the guarantee if it is drawn down by ATCO;
- Clause 16.2(f) grants rights to ATCO to retain surplus funds pending the replacement of a bank guarantee;
- Clause 16.2(g) sets out conditions precedent to an obligation upon ATCO to return the guarantee; and
- Clause 16.2(h) defines failure to comply with clause 16.2 as a contractual default.

1506. Alinta commented in its submission that it was unreasonable for all users to be required to provide a bank guarantee, asserting on page 9 that: "previously, a Bank Guarantee was only required where there was a material adverse change in a User's financial condition."

1507. In respect of the amendment requiring guarantees to be in the form of Annexure B, Alinta argued that the form of guarantees should be open to negotiation since different banks would have different requirements.

1508. In its submission to the Authority during the third access arrangement review of the GDS access arrangement, dated 19 April 2010, Alinta argued that setting security equivalent to two months' worth of charges would be arbitrary. Alinta preferred that security be limited to the minimum amount necessary to protect the service provider's legitimate business interests.

1509. The Authority has identified two general issues with clause 16.2 of the proposed revised template haulage contract. The first issue concerns the apparent change in the requirement to provide a bank guarantee. The second issue concerns the reasonableness of proposed detailed provisions governing the operation of the bank guarantee mechanism.

1510. The Authority notes the change in wording of clause 16.2(a), which, on its face, would result in all users having to provide security whereas previously this may not have been the usual practice.

1511. Alinta claimed in its submission that bank guarantees were previously only required where there was a material adverse change in a user's financial condition. This does not appear to be reflected in the current template haulage contract. It is possible that Alinta is referring to its individual haulage contract or an informal practice on ATCO's part in not enforcing a contractual right.

1512. The Authority notes that ATCO has an unqualified discretion under the current terms of the template haulage contract to require a bank guarantee. Yet, because the proposed wording of clause 16.2(a) imposes an obligation on the user for ATCO's benefit, it seems that ATCO would be entitled to unilaterally waive its right to the security. To summarise, ATCO is currently entitled, without qualification, to require a bank guarantee. ATCO's proposed revision would require the provision of the bank guarantee, unless ATCO waived that requirement. It is not clear to the Authority that there is a significant practical difference between these two situations.

1513. The true significance of ATCO's proposed amendment to clause 16.2(a) may be that it signals a change in ATCO's intended business practices. Whereas previously it may have exercised its right to require a bank guarantee selectively, the revised wording suggests that it intends to require bank guarantees as a matter of course during the fourth access arrangement period. If this is the case, this increases the importance of ensuring that the provisions governing bank securities are balanced and reasonable. Thus the Authority's position with respect to the change proposed in clause 16.2(a) is informed by its evaluation of the overall reasonableness of other provisions governing the operation of the bank guarantee mechanism.

1514. To assist it in evaluating the reasonableness of the proposed bank guarantee provisions, the Authority reviewed recently approved terms and conditions for three gas distributors in Victoria. The Authority found that in one case, that of Envestra, the approved terms and conditions provide the distributor with very wide discretion to require a bank guarantee, limited to the extent that the amount required must be reasonable. Envestra's terms and conditions also include a standard form of bank guarantee, but offer additional options.

1515. In the case of SP Ausnet and Multinet, the Authority found that bank guarantees can only be requested in specific circumstances. Examples of such circumstances include when the user's credit rating falls below specified levels and when the user has failed to pay a certain number of invoices on time. The amount that can be required in the case of SP Ausnet and Multinet is capped at a reasonable estimate of three months' worth of charges.

1516. The Authority considers that ATCO's proposed revisions for clause 16.2 would establish a set of rules slightly more restrictive on the service provider than Envestra's terms and conditions but considerably less restrictive than those of SP Ausnet and Multinet. It is the absence of any threshold of user credit worthiness in the case of clause 16.2, which particularly distinguishes ATCO's proposal from SP Ausnet and Multinet.

1517. The Authority notes that in its Final Decision for the third access arrangement review, it disallowed amendments to the template haulage contract that were substantially or entirely the same as proposed clauses 16.2 (d), (e), (f) and (g), as well as Annexure B (see required amendment 48). The Authority's basis for this position, summarised at paragraph 1296 of the Final Decision was that these detailed provisions did not "form part of the terms and conditions on which reference services will be provided as required by rule 48(1)(d)(ii) of the NGR". However, as the comparison with terms and

conditions of Victorian distributors illustrates, there is considerable scope for different interpretations about the degree of detail appropriate to the template haulage contract.

1518. The Authority does not specifically object to the prescription of a form (Annexure B), to the increased cap or to any of the changes set out in clauses 16(b) to 16.2(h). However, the Authority is concerned that the amendments proposed in clause 16.2 of the proposed revised template haulage contract may become unreasonable, in light of the absence of any risk assessment obligation on ATCO.

1519. The requirement to provide, maintain and update a bank guarantee imposes costs on a user. The implication of the proposed requirement for bank guarantees by default (16.2(a)) is that this cost will be imposed routinely without regard to how necessary it actually is.

1520. Accordingly, the Authority offers ATCO the following two options for revision:

- Option one: remove all of the proposed amendments to clause 16.2
- Option two: limit ATCO's entitlement to require a bank guarantee to circumstances where ATCO might reasonably conclude that the user presents an unacceptable credit risk. By way of further guidance on defining an acceptable credit risk, Authority notes with approval clause 7.8(a) of the approved terms and conditions for the Victorian gas distributors SP Ausnet and Multinet.

Required Amendment 38.

Either:

Clause 16.2 of the proposed revised template haulage contract should revert to the wording of clause 14.2 of the current template haulage contract;

Or:

Clause 16.2(a) of the proposed revised template haulage contract should be amended to limit ATCO's right to require a bank guarantee to those circumstances where ATCO might reasonably conclude that the user presents an unacceptable credit risk.

Representations and warranties

1521. ATCO has proposed detailed new provisions in clause 18, regarding representations and warranties. Currently the template haulage contract provides a placeholder for the parties to insert agreed representations and warranties. Clause 18.1 of the proposed revised template haulage contract sets out numerous representations and warranties provided by the user to the service provider. Clause 18.2 sets out separate representations and warranties made by the service provider to the user.

1522. The Authority has not received any public submissions in relation to clause 18.

1523. Most of the proposed additions in clause 18 of the proposed revised template haulage contract reprise amendments proposed by WAGN during the third access arrangement review. Clauses 18.1(l), (o) and (p) appear to be the only clauses proposed by ATCO that were not also previously proposed by WAGN during the third access arrangement period review. The Authority rejected all of WAGN's proposed representations and

warranties, requiring them to be replaced with a placeholder for provisions that the user and the service provider negotiate.

1524. In its Final Decision for the third access arrangement review, at paragraph 1354, the Authority wrote that it was:

> "…not in position to determine whether the representations and warranties contained in clause 17 promote efficient investment and operation in the WAGN GDS as the representations and warranties listed in clause 17 are promises made by contracting parties based on their commercial position at the time of entering into the Template Haulage Contract. The Authority cannot ensure that such representations and warranties are appropriate in every situation involving a user and service provider but rather considers such provisions [are better] to be dealt with by negotiation between the parties depending on their circumstances."

1525. The Authority notes that the regulated terms and conditions for the Victorian gas distributors do include some specific representations and warranties. These instruments provide useful reference points for the Authority in judging the consistency of the proposed provisions with the NGO. In part because of these precedents, the Authority has reconsidered its previous approach and determined to evaluate the individual representations and warranties against the balancing test described in paragraphs 1315 to 1317.

1526. In the case of Envestra's regulated terms and conditions, the user must warrant that it has unencumbered title to any gas delivered into the distribution network on its account and that it has rights to enable it to deliver gas to the distribution network.

1527. In their regulated terms and conditions, Multinet and SP Ausnet have representations and warranties to the effect that each party:

- holds the relevant retail or distribution licences;
- is incorporated or established and validly existing;
- has full power, authority and legal right to execute, deliver and perform its contractual obligations;
- will not, by entering into the contract, be in conflict with other obligations owed by that party to a third party; and
- is not insolvent or subject to insolvency proceedings at the time of entering into the contract.

1528. By seeking a large number of representations and warranties from users, ATCO has sought to shield itself to a greater extent than observed in the Victorian examples above. ATCO has not explained why it requires such extensive protections and why it is appropriate that those protections should not be mirrored by equivalent protections for the user's benefit.

1529. The Authority has categorised the user representation and warranties into several groups as follows:

- Representations and warranties that reiterate obligations already owed by the user pursuant to other provisions of the template haulage contract or by law. Clauses 18.1(a), (b) concerning adherence to the System Pressure Protection Scheme, 18.1(c) concerning compliance with laws, 18.1(k) concerning unfettered access, 18.1(l) concerning insurances, 18.1(m) concerning the Retail Market Scheme and 18.1(o) concerning title to gas, are all in this category.

- Representations and warranties that provide a second layer of protections, over and above the bank guarantee provisions, against the risk of not being paid. Clause 18.1(f) falls in this category.
- Other representations and warranties concerning matters that may be associated with general commercial risks for the service provider. These are clauses 18.1(d) and (j) concerning licences, approvals and easements, 18.1(e) concerning power to contract, 18.1(g) concerning ongoing breaches of laws or obligations, 18.1(h) concerning pending or threatened legal proceedings, 18.1(i) concerning status as a trustee, 18.1(n) concerning third party compliance with the retail market scheme, and 18.1(p) concerning the right to supply gas into the GDS for distribution.

1530. The Authority considers that the representations and warranties reiterating obligations already owed by the user will provide minimal benefit, but will complicate the task of contractual interpretation and may give rise to ambiguities.

1531. For instance, it is not obvious to the Authority that the representation and warranty provided under clause 18.1(k), which requires a warranty that all instruments necessary to secure unfettered access are in place, is entirely consistent with clause 9.3(b), which requires only reasonable endeavours on the part of the user to ensure unfettered access.

1532. Even if all representations and warranties are indeed consistent with the other provisions of the template haulage contract, it seems to the Authority that these reiterating clauses risk making it more difficult to ascertain the precise rights and obligations of the parties. If ATCO considers that the protections afforded elsewhere in the document are inadequate, it should propose modifications to those provisions. Accordingly, the Authority requires that Clauses 18.1(a), (b), (c), (k), (l), (m), and (o) be deleted.

1533. The Authority considers that the provision of a second layer of protections against the risk of not being paid may be excessive. Given that ATCO currently has rights to credit risk protection in the form of a bank guarantee, it is unclear to the Authority why it should also require guarantees from the User regarding the priority of debts. Further, the Authority notes that if ATCO were to adopt a similar approach to that taken by Multinet and SP Ausnet in relation to bank guarantees, it would obtain independent information on a user's credit worthiness. This appears to the Authority to be an approach to managing credit risk that is superior to relying on user representations and warranties. Accordingly, the Authority considers that clause 18.1(f) should be deleted.

1534. Turning to the various representations and warranties bearing on general commercial risk, the Authority considers that only some of these provisions are consistent with the NGO.

1535. Clause 18.1(d) is so broadly worded that there appears to be scope for the clause to be breached as a result of potentially minor oversights on the part of the user. For example, it is conceivable that the parties may contract in good faith, but the user may overlook particular authorisations. It will depend on the circumstances as to what should be the appropriate contractual consequence of such an oversight. Further, the Authority can see no reason why clause 18.1(d), if it were considered appropriate by the parties, would not apply reciprocally. Negotiating a reciprocal provision of this kind should be readily available to the parties. Leaving this to commercial negotiation should reduce the risk of unforeseen effects.

1536. The Authority considers that it is preferable for the parties to specify any authorisations, licences, permits, consents, certificates, authorities and approvals that they consider particularly important. Accordingly, the Authority considers that clause 18.1(d) should be deleted. Clause 18.1(j) should be deleted for the same reasons.

1537. The Authority considers that clause 18.1(e), concerning power to contract, is unlikely to have unforeseen effects. However, to be consistent with the NGO, the Authority considers that this representation and warranty should be made by each party for the other's benefit. The Authority requires that clause 18 be amended such that the user's obligation specified in 18.1(e) is reciprocated with an equivalent obligation on the service provider.

1538. Clause 18.1(g) may exhibit some potential for unforeseen effects, but appears to be a provision that the parties would find useful to specify in a large majority of circumstances. This suggests to the Authority that including the clause could be justified because the benefit from facilitating access quickly is likely to outweigh the risks of unforeseen effects. However, as for clause 18.1(e), the Authority considers it appropriate to make the provision reciprocal. The Authority requires that clause 18 be amended such that the user's obligation specified in 18.1(g) is reciprocated with an equivalent obligation on the service provider.

1539. The Authority is concerned that 18.1(h) requires of the user a representation and warranty that it is not within the user's control to maintain compliance with. The user could be placed in breach of the clause if a third party were to bring a vexatious action against it, or merely threaten action. Accordingly, the Authority requires that clause 18.1(h) be deleted.

1540. The Authority has not concluded that the subject matter of clause 18.1(h) is inappropriate to address in the template haulage contract. The Authority considers that if the template haulage contract is to deal with the subject of third party legal proceedings (and similar), the template haulage contract would deal with it differently.

1541. The Authority accepts that, at the point of entering into the contract, the parties would reasonably wish to be informed of legal proceedings that could prejudice performance of the contract. Once the contract has commenced, the Authority considers that the parties would reasonably wish to be notified of pending or current legal proceedings. These points may suggest that the contract could usefully include a provision relating to pre-contractual disclosure and an ongoing notification requirement in respect of legal proceedings (and similar). The Authority considers that the threat of legal proceedings may be too minor a threshold to activate a disclosure or notification requirement. The Authority would also be more likely to regard disclosure and notification requirements as consistent with the NGO if they set out reciprocal obligations on the user and the service provider.

1542. For the same reasons given for accepting clause 18.1(g), the Authority accepts clause 18.1(i).

1543. The effect of, and need for, clause 18.1(n) is not clear to the Authority. The template haulage contract already imposes obligations and liabilities on the user to ensure particular conduct or outcomes from other pipeline operators or other parties responsible for delivering gas to GDS receipt points. Clauses 6.7 and 6.9 provide relevant examples. Given the complexity of the Retail Market Scheme, the Authority is unwilling to approve clause 18.1(n) in the absence of analysis of the additional obligations that would flow from this clause and justification for why these obligations are appropriate. Accordingly, clause 18.1(n) should be deleted.

1544. The need for clause 18.1(p) is not apparent to the Authority. The user's ability to deliver gas to the relevant receipt points is already a condition precedent to the contract (clause 1(a)(iii)(D)). The user already has obligations in respect of gas balancing (clause 6.7) and maintaining system pressure (clause 6.9). ATCO has also sought indemnities from the user under clause 7.1(b) should any third party claim an interest in the gas the user has introduced into the system. It appears to the Authority that clause 18.1(p) may require of the user an undertaking to do things that it has already effectively committed to by virtue of assuming other obligations under the contract. Accordingly, the Authority requires clause 18.1(p) to be deleted.

Required Amendment 39.

Clauses 18.1(a), (b), (c), (d), (f), (h), (j), (k), (l), (m), (n), (o), and (p) of the proposed revised template haulage contract should be deleted.

Clause 18 of the proposed revised template haulage contract should be amended to make the obligations imposed on the user in clauses 18.1(e) and (g) reciprocal.

Intellectual property

1545. ATCO has proposed a new clause 21.1 in its proposed revised template haulage contract concerning rights to intellectual property. Clause 21.1(a) provides that documents, tools, software, reports, diagrams, plans and other materials provided by a party remain property of that party. Clause 21.1(b) provides that any of these items created under the haulage contract will immediately be the property of ATCO.

1546. No public submissions were received in relation to clause 21.1.

1547. However, the Authority notes that Alinta made a comment on intellectual property in its submission to the Authority during the third access arrangement review of the GDS access arrangement, dated 19 April 2010. On page 16 of that submission, Alinta argued that all documents, tools, software, reports, diagrams, plans and other materials created by the user should be recognised as being owned by the user.

1548. The Authority notes that clause 21.1 of the proposed revised template haulage contract is essentially the same as a provision proposed by WAGN during the third access arrangement review and rejected by the Authority.

1549. The Authority determined that the template haulage contract should not seek to allocate or confirm intellectual property rights, regarding this as a matter that did not bear on the question of consistency with the NGO (paragraph 1744 of the Draft Decision for the third access arrangement review). The Authority concluded that intellectual property matters were better left to bilateral commercial negotiation.

1550. The Authority remains of the view that the intellectual property matters dealt with in clause 21.1 are not appropriate to be included in the template haulage contract. In the Authority's judgement, the intellectual property that is likely to be created and how it should be allocated will depend on the circumstances. Therefore, the Authority considers it better to leave the parties to negotiate terms reflecting their individual concerns and priorities regarding intellectual property. The Authority refers to its earlier remarks about striking a balance between facilitating access quickly and avoiding unforeseen effects (see paragraphs 1315 to 1317).

1551. The Authority requires clause 21.1 to be deleted and heading number 21 amended to remove the words "intellectual property".

Required Amendment 40.

Heading 21 should be amended as follows:

21~~. INTELLECTUAL PROPERTY,~~ CONFIDENTIALITY AND INFORMATION EXCHANGE

Clause 21.1 should be deleted.

Consistency between access arrangement and retail licence obligations

1552. Gas retailers such as Alinta and Kleenheat must, as a condition of their retail licences, comply with the *Compendium of Gas Customer Licence Obligations* (**Compendium**). The Compendium is a Schedule to all gas licences, and is administered by the Authority. It regulates the conduct of retailers and distributors supplying customers that consume no more than 1TJ of gas per annum.

1553. One of the requirements imposed by the Compendium specifies the retailer's minimum billing frequency to be "at least every 3 months", subject to several exceptions.[622] The Compendium also requires retailers to base a bill, where reasonably possible, on a meter reading.[623]

1554. A retailer needs a customer's consumption data (either actual or estimated) within this timeframe in order to issue a bill to a customer. However, the access arrangement currently does not oblige ATCO to supply consumption data at the same frequency. Schedules 4 and 5 of the proposed amended template haulage contract describe the service provider's obligations with respect to meter reading in the case of reference services B2 and B3, respectively.[624] Clause 4(b) of both schedules reads:

> "<Service Provider> must use reasonable endeavours to read the Meter approximately 4 times each Year at intervals of approximately 100 days."

1555. This review of ATCO's access arrangement provides an opportunity to consider whether ATCO's obligations with respect to meter reading frequency should be adjusted to align its obligations with the retailer's billing frequency obligations under the Compendium.

1556. It should be noted that ATCO's current meter reading obligations under Schedules 4 and 5 imply two different frequencies. A frequency of four times each year implies meter readings every three months or every 91 days, on average. Intervals of approximately 100 days implies four readings that occur over a period of between 13 and 14 months.

1557. Rule 144(3) of the Retail Market Rules requires that the meter reading frequency specified in the meter reading schedule must reflect the frequency agreed between the

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622 Clause 4.1(b) of the Compendium of Gas Customer Licence Obligations.

623 Clause 4.6(1) and 4.8(1) of the Compendium of Gas Customer Licence Obligations.

624 These are the reference services most likely to apply to residential and small business customers, being customers likely to consume less than 1 TJ of gas per annum.

network operator and the user. This leads to the question, which of the two frequencies given in Schedules 4 and 5 of the proposed amended template haulage contract reflects the agreed frequency?

1558. The Authority understands that for customers on the B2 and B3 reference services, ATCO generally supplies retailers with consumption data every 90 days. In a large number of instances, the data reflects estimated rather than actual meter readings. The fact that ATCO has been supplying data typically at a 90 day frequency, suggests that it probably plans its reading schedule to deliver reads "approximately four times each year" rather than "at intervals of approximately 100 days".

1559. The Authority considers that the access arrangement should define more clearly the service provider's obligations with respect to:

- reading the meter; and
- providing data to the user.

1560. The service provider's obligation to read the meter must be clearly defined because it provides the reference point picked up by Rule 144(3) of the Retail Market Rules, as noted above. An obligation for the service provider to use its best endeavours to read each meter at least every three months would provide a clearer reference point for the purposes of Rule 144(3), and would better align with retailers' billing frequency obligations under the Compendium. A requirement on the service provider to use its best endeavours, should not increase the number of meter readings required.

1561. ATCO should also be obliged to provide data to the user at a given frequency. Where ATCO's best endeavours do not result in an actual meter read, ATCO (as opposed to the retailer) is best placed to produce an estimated read. This is because ATCO possesses historical data that may not be available to a given retailer for the meter in question. The Authority considers it reasonable to expect ATCO to provide consumption data to the user at least every three months.

1562. The Authority expects ATCO's meter reading scheduling system and its meter reading program to be sufficiently streamlined to ensure that, for a large majority of meters, ATCO will meet its data provision requirement by supplying actual meter data. Similarly, the Authority considers that ATCO's data management systems should be able to anticipate when an actual meter read will not be available in time to supply consumption data to the user within the three month deadline. This would enable ATCO to provide a timely estimated meter read instead.

1563. The Authority recognises that if ATCO fails to meet its obligations to provide data within the three month deadline by a single day, a retailer choosing only to bill based on consumption data from the service provider may then also fail to meet its obligation under the Compendium, to bill the customer at least every 3 months. The Authority considers that retailers should mitigate this risk by ensuring their systems can bill a customer based on the retailer's own estimate of that customer's consumption during the billing period. The same point was recently made by the AER in its Small Customer Billing Review.[625]

[625] Australian Energy Regulator, *Small Customer Billing Review*, February 2014, p. 11.

Required Amendment 41.

Clause 4 of Schedule 4 and Schedule 5 of the proposed revised template haulage contract should be amended as follows:

(b) <Service Provider> must use ~~reasonable~~ best endeavours to read the Meter ~~approximately~~ at least every three months ~~4 times each Year at intervals of approximately 100 days~~.

(c) <Service Provider> must provide consumption data (estimated or actual) to the user at least every three months.

Definition of terms

1564. ATCO has proposed deleting the dictionary clauses contained with the current template haulage contract (clause 21.1) and access arrangement (clause 12.1), with the intention of replacing it with a separate glossary to "provide a uniform reference point for all documents comprising the access arrangement".[626]

1565. No public submissions were received in relation to the proposal to delete the dictionary clauses contained with the current template haulage contract (clause 21.1) and access arrangement (clause 12.1), with the intention of replacing it with a separate glossary.

1566. The Authority acknowledges ATCO's reasoning in proposing to delete the dictionaries from both the template haulage contract (clause 21.1 of the current version) and access arrangement (clause 12.1 of the current version). It also recognises that this is consistent with the approach taken by the Authority in other instances where provisions of the proposed revised template haulage contract overlap with provisions in the access arrangement.

1567. In this case, however, the Authority considers that there is an overriding benefit in retaining definitions within the template haulage contract and the access arrangement documents, notwithstanding the resulting duplication. Owing to the volume of terms that need to be defined, it would not be workable to attempt to interpret either document without reference to the set of definitions. Including definitions within the documents will allow them to be interpreted considerably more conveniently.

1568. In the case of the template haulage contract, the Authority has also taken into account the desirability of making that document easily convertible into an individual haulage contract. Particularly in the context of negotiated amendments to the contract, it is readily foreseeable that the parties may need to include specific definitions. Again, in the interests of maintaining ready interpretability, it will be beneficial to have those definitions that are required for the haulage contract consolidated in one place.

1569. In any event, the Authority would not accept the deletion of clause 21.1 of the current version of the template haulage contract and clause 12.1 of the access arrangement, on the grounds that ATCO has not included replacement definitions in its proposed

[626] ATCO Australia, *Access Arrangement Information 1 July 2014 - 31 December 2019 (AA4)*, 17 March 2014, p. 41.

revised access arrangement. The glossary put forward by ATCO only forms part of the access arrangement information.

1570. For the reasons above, the Authority requires that clause 21.1 of the current version of the template haulage contract and clause 12.1 of the current access arrangement be retained. ATCO should ensure that the definitions for any shared terms are identical.

Required Amendment 42.

Clause 21.1 of the current version of the template haulage contract should be retained in the revised template haulage contract.

Clause 12.1 of the current access arrangement should retained in the revised access arrangement.

Both clauses should be revised, as necessary, to ensure that any shared terms are defined identically in both dictionaries.

Guaranteed Service Level Scheme

1571. ATCO has inserted into its proposed revised template haulage contract footnote 46, which reads as follows:

> "ATCO Gas Australia operates a Guaranteed Service Level scheme which provides for compensation to Small Use Customers (as defined in s 3 of the Energy Coordination Act 1994 (WA)) who have been inconvenienced by disruption to their gas supply. The specific requirements of this scheme are set out in the Authority's Gas Compliance Reporting Manual and are a condition of ATCO Gas Australia's Gas Distribution Licence (Clause 16 – Individual Performance Standards)) and a requirement of s 11M of the Energy Coordination Act 1994 (WA)."

1572. The second sentence of proposed footnote 46 is incorrect. The guaranteed service level scheme is not imposed under ATCO's distribution licence. The scheme is operated voluntarily by ATCO.

1573. The second sentence of footnote 46 should be deleted.

Required Amendment 43.

Footnote 46 should be amended as follows:

> ATCO Gas Australia operates a Guaranteed Service Level scheme which provides for compensation to Small Use Customers (as defined in s 3 of the Energy Coordination Act 1994 (WA)) who have been inconvenienced by disruption to their gas supply. ~~The specific requirements of this scheme are set out in the Authority's Gas Compliance Reporting Manual and are a condition of ATCO Gas Australia's Gas Distribution Licence (Clause 16 – Individual Performance Standards)) and a requirement of s 11M of the Energy Coordination Act 1994 (WA).~~

Terminology

1574. ATCO has proposed to retain the existing terminology in the template haulage contract regarding the services to which it relates. Thus, the proposed revised template haulage contract refers predominantly to “pipeline services” and “haulage services”, rather than “reference services”.

1575. ATCO has also retained the term “haulage contract”, while the access arrangement predominantly uses the term “service agreement”.

1576. No submissions were received concerning the use of the terms “pipeline services” and “haulage services”, rather than “reference services”.

1577. No submissions were received on the use of the terms “haulage contract” or “service agreement”.

1578. The term pipeline services covers reference and non-reference services. The access arrangement is intended to set price and non-price terms and conditions for access to reference services. The extensive use of the term “pipeline services” has the effect of clouding the scope of the template haulage contract.

1579. The Authority recognises that the individual contracts struck between users and ATCO may expand the scope of the agreement to include pipeline services that are not reference services. However, the Authority considers that the template haulage contract should not be drafted in anticipation of this expansion in scope.

1580. ATCO should revise the template haulage contract in a manner that makes clear that it prescribes terms or conditions for access to reference services, rather than other pipeline services that are not regulated by the access arrangement. To do this, the term “pipeline service” should be replaced with the term “reference service”, except in any specific instances in which ATCO considers that this would have unintended consequences.

1581. A similar question of intended scope arises from the use of the term “haulage service”. The Authority understands the term “reference services”, in the context of ATCO’s access arrangement, to cover both the transportation of gas (haulage services) and various additional activities necessary to manage the supply of gas to end-users (ancillary services).

1582. The Authority views many of the provisions contained in the template haulage contract as being equally relevant to ancillary services as to haulage services. Thus, in some cases, it appears more sensible to replace the term “haulage service” with the term “reference service”, thus removing any doubt that the relevant provisions cover the provision of both haulage and ancillary services. Some examples of where this amendment appears appropriate include the following clauses of the proposed revised template haulage contract.

- Clause 3: "This Haulage Contract specifies the terms and conditions on which <Service Provider> agrees to provide <User> with access to the ~~Haulage~~ Reference Services by means of the AGA GDS in accordance with the Regulatory Instruments, including the Access Laws"; and
- Clause 4.1: "<User> must pay to <Service Provider>: (a) the applicable ~~Haulage~~ Charge for each ~~Haulage~~ Reference Service accessed by <User> under this Haulage Contract.

1583. Finally, it seems sensible to amend the name of the instrument "Template Haulage Contract" to reflect the facts that:

- the term "haulage" does not reflect the true scope of the agreement; and
- the access arrangement makes repeated reference to a "service agreement" between the user and service provider, which is understood to be a contract for provision of reference services based on the template haulage contract.

1584. Accordingly, the Authority considers that the template haulage contract should be renamed the "template service agreement". This term is consistent with the instrument being a template for an agreement for the provision of services including, but not limited to, haulage services. The name will also improve the consistency between the access arrangement and the template haulage contract, making interpretation somewhat more straightforward.

1585. References to "template haulage contract" in other access arrangement documents should be amended accordingly and references to "haulage contracts" in the template haulage contract should be replaced with the term "service agreements".

1586. The Authority has dealt with this issue last in this Draft Decision in order to avoid using revised terminology in all of its discussion and required amendments relating to the template haulage contract. The Authority has been concerned that the additional complexity that this would have introduced could obscure the explanation of the Authority's various positions. Consequently, the required amendments preceding Required Amendment 44 have not used the revised terminology required by the Authority. All of these required amendments should be implemented consistent to the terminology substitutions set out in Required Amendment 44.

Required Amendment 44.

The term "pipeline service" should be replaced with the term "reference service" throughout the template haulage contract, except in the case of any specific provisions for which this would have unintended consequences.

The term "haulage service" should be replaced with the term "reference service" wherever it is intended for the provision to also apply to ancillary services.

The template haulage contract should be renamed "template service agreement" and any references to "template haulage contract" in other access arrangement documents should be amended as appropriate.

References to "haulage contracts" should be replaced with the phrase "service agreements" and any references to "haulage contracts" in other access arrangement documents should be amended as appropriate.

Required Amendment 45.

The revised wordings set out in Required Amendment 24 to Required Amendment 43 are to be read as if the substitutions described in Required Amendment 44 had been made.

Appendices

Appendix 1 Summary of Required Amendments

Required Amendment 1.
Clause 4.1 should be amended as follows:

4.1 Pipeline Services

ATCO Gas Australia offers the following Pipeline Services by means of the AGA GDS to Prospective Users:

a) Reference Services, being the Haulage Services; and

b) ~~Non-Reference Services.~~ Reference Services, being the Ancillary Services; and

c) Non-Reference Services.

Required Amendment 2.
The Authority requires that ATCO amend the proposed revised access arrangement values for total revenue (nominal) to reflect the values in Table 4.

Required Amendment 3.
The Authority requires that ATCO update the GDS demand forecast for the fourth access arrangement period in accordance with Table 8**.**

Required Amendment 4.
The Authority requires that ATCO amend KPI targets as per Table 10 of this Draft Decision.

The Authority also requires that ATCO develop an asset health KPI, and propose a target for it for the fourth access arrangement period.

Required Amendment 5.
The Authority requires ATCO to amend its forecast operating expenditure for the fourth access arrangement period ($347.48 million in real dollars million at 30 June 2014) in line with Table 17 of this Draft Decision.

Required Amendment 6.
The opening capital base for 1 July 2014 in the proposed access arrangement must be amended to reflect the values in Table 26 of this Draft Decision.

Required Amendment 7.
The value of conforming capital expenditure for 2014 to 2019 access arrangement period must be amended to reflect the values shown in Table 36 of this Draft Decision.

Required Amendment 8.
The projected capital base in the proposed access arrangement must be amended to reflect the values in Table 41 of this Draft Decision.

Required Amendment 9.
The Authority requires that ATCO revise its rate of return to be 5.94 per cent.

The Authority requires that ATCO insert a fixed principle in its access arrangement that will bind it to apply an adjustment to the debt risk premium set for the fifth access arrangement period – in present value revenue neutral terms – which will account for the difference between the debt risk premium set at the start of the fourth access arrangement, and the actual annual update outcomes for the debt risk premium that applied in each of the second to fifth years of the fourth access arrangement period.

Required Amendment 10.
ATCO is required to adopt a gamma of 0.5.

Required Amendment 11.

The Authority requires that ATCO adopt the current cost accounting approach to depreciation, based on the indexed value of the calculated real depreciation and amend section 9 (Depreciation) to ensure that it is consistent with the current cost accounting approach.

The Authority requires that ATCO amend section 9.1 of its access arrangement as follows:

(a) For the calculation of the nominal (indexed) Opening Capital Base for the WAGN AGA GDS for the Next Access Arrangement Period, depreciation over the Current Access Arrangement Period is to be calculated in accordance with the real straight line depreciation method – where the real opening capital base in any year is divided by the remaining asset life – and then converted to nominal terms by applying indexation to the calculated real annual depreciation, and is to be the sum of:

(i) indexed real depreciation on the Opening Capital Base over the Current Access Arrangement Period;

(ii) indexed real depreciation of the forecast Capital Expenditure for the Current Access Arrangement Period (being the amount of forecast Capital Expenditure used for the purpose of determining Haulage Tariffs for the Current Access Arrangement Period); and

(iii) indexed real depreciation of any unanticipated Regulatory Capital Expenditure for the Current Access Arrangement Period (being depreciation calculated in accordance with Clause 3 of Annexure B of this Access Arrangement).

(b) For the calculation of the Opening Capital Base for the WAGN AGA GDS for the Next Access Arrangement Period, each of:

(i) the nominal (indexed) Opening Capital Base (end of period) for the Current Access Arrangement Period adjusted for any difference between estimated and actual nominal (indexed) Capital Expenditure included in that Opening Capital Base. This adjustment must also remove any benefit or penalty associated with any difference between the estimated and actual capital expenditure;

(ii) nominal (indexed) Conforming Capital Expenditure made, or to be made, during the Current Access Arrangement Period;

(iii) any nominal (indexed) amounts added to the Capital Base under rule 82, rule 84, and rule 86 of the National Gas Rules;

(iv) nominal (indexed) depreciation over the Current Access Arrangement Period (calculated in accordance with paragraph 9.1(a));

(v) nominal (indexed) value of redundant assets identified during the course of the Current Access Arrangement Period; and

(vi) the nominal (indexed) value of Pipeline Assets disposed of during the Current Access Arrangement Period;

all indexed consistent with the rate of inflation as measured by the CPI All Groups, Weighted Average of Eight Capital Cities as at 31 December of each regulatory year.

The Authority requires that ATCO change the asset life for vehicles to ten years or provide justification to the Authority that the reduction to 5 years is consistent with rule 89 of the NGR.

Required Amendment 12.
The Authority requires that ATCO update the calculation of the estimated cost of income tax as per Table 59.

The Authority also requires that ATCO revise the TAB as per Table 60, to implement the following:

The Authority requires that ATCO:

Required Amendment 13.
The value of return on working capital for the fourth access arrangement must be amended to reflect the values shown in Table 63 of this Draft Decision.

Required Amendment 14.
The value of tariff revenues to be allocated for the calculation of haulage tariffs for the fourth access arrangement period must be amended to reflect Table 67 of this Draft Decision.

Required Amendment 15.
The Authority requires that ATCO update its calculation of the B3 standing charge, in addition to all haulage tariff price paths, as per Table 72 of this Draft Decision.

The Authority also requires that ATCO provide the Authority with updated avoidable costs and standalone costs by tariff class in response to this Draft Decision.

Required Amendment 16.
The Authority requires that ATCO remove references to revenue yield in Annexure A, and remove clause 2 and clause 3 (B) and update all the formulas in Annexure B of the Access Arrangement to reflect the following:

To maintain the current tariff variation mechanism for B2 and B3 customers for the fourth access arrangement period as in the approved current access arrangement;

To exclude cost pass-throughs for regulatory costs (clause 3.1 (iii) (B) of Annexure B); and

The Authority also requires that ATCO reword clause 3.1 (iii) (A) in Annexure B as follows:

“Conforming Capital Expenditure or Conforming Operating Expenditure as a direct result of a Change in Law or Tax Change.”

The Authority requires that ATCO reword clause 3.1 (iv) in Annexure B as follows:

“ATCO Gas Australia incurs Conforming Capital Expenditure or Conforming Operating Expenditure as a direct result of any Law that imposes a fee or Tax on greenhouse gas emissions or concentrations; and for avoidance of doubt, this expenditure includes only direct capital or direct operating expenditure associated with preparation for, compliance with the Laws which implement, and the participation in, the Emissions Trading Scheme; and liability only for direct capital or direct operating expenditure transferred to ATCO Gas Australia from another entity as a direct result of accordance with the Emissions Trading Scheme.”

The Authority requires the removal of clause 3.1(v) in Annexure B.

The Authority requires that ATCO reword clause 3.2 in Annexure B as follows: “If a Cost Pass Through Event occurs, ATCO Gas Australia must notify the ERA of the Cost Pass Through Event, and may vary one or more Haulage Tariffs to recover only direct Conforming Operating Expenditure and depreciation of and return on direct Conforming Capital Expenditure incurred or forecast to be incurred by ATCO Gas Australia (or on ATCO Gas Australia’s behalf) as a direct result of the Cost Pass Through Event, provided that these costs have not already been recovered by ATCO Gas Australia.

A consequential amendment is required to clause 4.2. The Authority requires ATCO to amend the wording of clause 4.2 to read:

"ATCO Gas Australia will use its best endeavours to give the ERA a variation report at least 40 Business Days before the date on which the Haulage Tariff is to be varied as a

result of a Cost Pass Through Event, and that report shall contain the following information:

(a) a statement of reasons for the variation of the Haulage Tariff as a result of the Cost Pass Through Event;..."

Required Amendment 17.
The Authority requires that ATCO adjust the ancillary service volumes and tariffs as per Table 75 of this Draft Decision.

The Authority requires ATCO to confirm that ancillary services are provided by external resources, and if these services are provided using internal resources, further justification on the efficiency of these costs.

The Authority requires that ATCO justify whether the ancillary service revenue to be recovered for each customer lies between an upper bound (the stand alone cost of providing the reference service to the customer) and a lower bound (the avoidable cost of not providing the reference service to the customer) as per rule 94(3) of the NGR.

Required Amendment 18.
The Authority requires that ATCO amend Annexure C of the Access Arrangement to reflect the Authority's decision that the ancillary service tariff variation be varied based on the Consumer Price Index – Weighted Average for Eight Capital Cities.

Required Amendment 19.
Clauses 5.5(a)(vi), 5.5(a)(x), 5.5(a)(xi) and 5.5(b) of the proposed revised access arrangement should be deleted.

Required Amendment 20.
Clause 6.1 of the access arrangement should be amended as follows:

6.1 Capacity Trading Requirements to be specified in the Service Agreement

A User's right to transfer its contracted capacity to another person will be set out in the User's Service Agreement with ATCO Gas Australia. The terms and conditions for the transfer of contracted capacity for Haulage Services are set out in clause 14 of the Template Haulage Contract. In accordance with the Template Haulage Contract, a user will have qualified rights to transfer some or all of its contracted capacity for Haulage Services to one or more third parties.

Clauses 6.2 to 6.4 of the access arrangement should be deleted.

Required Amendment 21.
Include definitions in the access arrangement on what constitutes a low pressure, medium pressure and high pressure pipeline in the access arrangement.

Amend section 7.2 Extensions of medium and low pressure pipelines to include high pressure pipelines not captured by the High Pressure Pipeline Extension definition.

Amend the definition of a High Pressure Pipeline Extension as follows: "means for the purpose of the Template Haulage Contract and for section 7 of the Access Arrangement an extension to <Service Provider> Covered Pipeline with a direct connection to a transmission pipeline that provides reticulated gas to a new development or an existing development not serviced with reticulated gas or an extension to <Service Provider> Covered Pipeline with a Maximum Allowable Operating Pressure of greater than 1,000kPa and greater than 25km in length.

Required Amendment 22.
The Authority requires that ATCO remove Fixed Principle 11.1 (a) and 11.1 (c).

The Authority requires that ATCO remove Fixed Principle 11.2(a).

The Authority requires that ATCO delete Fixed Principles 11.3 and 11.4 from the revised access arrangement for the fourth access arrangement period.

The Authority requires that the access arrangement include an additional fixed principle as follows: "Differences between the published update of the debt risk premium, for years 2 to 5 of the fourth access arrangement, and the regulatory debt risk premium applying from July 2014 to December 2019 (the fourth access arrangement period), will be used to adjust the estimated debt risk premia applying during the years of the fifth access arrangement period. The resulting adjustment must ensure that any net revenue differences between the total approved revenue for the fourth access arrangement period, and the total revenue for the fourth access arrangement period that would have arisen with the application of the published annual updates, are accounted for in the total approved revenue for the fifth access arrangement period, in present value neutral terms."

Required Amendment 23.
Clause 1 of the proposed revised template haulage contract should be amended as follows:

(a) Other than this clause 1 and clauses ~~15,~~ 16, ~~17, 18,~~ 19, ~~20,~~ 21, 22 and 23 this Template Haulage Contract has no force or effect until…

(a)(iii)(D) <User> is~~, and will for the duration of this Haulage Contract remain,~~ able to deliver…

(d) Other than with respect to the Conditions Precedent referred to in clause~~s~~ 1(a)(ii) ~~and 1(a)(iv)~~, <Service Provider> must promptly advise …

Required Amendment 24.
Clauses 13.5(b), 13.5(c) and 13.5(d) of the proposed revised template haulage contract should be deleted.

Required Amendment 25.
Clauses 13.2, 13.3 and 13.4 of the proposed revised template haulage contract should be deleted.

Clause 22.3 of the proposed revised template haulage contract should be amended as follows:

22.3 Amendment

This Haulage Contract may only be amended:

(a) In the absence of revisions to the access arrangement, by written agreement of the Parties; or

(b) where the access arrangement has been revised, [User and Service Provider to insert agreed terms for the amendment of the haulage contract upon revision of the access arrangement].

Required Amendment 26.
Clause 13.6 of the proposed revised template haulage contract should be deleted and replaced with the following provision:

13.6 Laws to take precedence

(a) In the event of any inconsistency between:

(i) a party's obligations or rights under a Law; and

(ii) its obligations or rights under this Haulage Contract,

its obligations and rights under the Law shall take precedence to the extent of the inconsistency.

(b) Where this Haulage Contract contains provisions which regulate a matter in greater detail than the provisions of a Law then the provisions of this Haulage Contract will not be taken to be inconsistent merely by reason of the inclusion of that additional detail and the provisions of this Haulage Contract will continue to apply to that matter to the extent permitted by the terms of the Law.

Required Amendment 27.
Clause 5.3(b) of the proposed revised template haulage contract should be deleted.

Required Amendment 28.
Schedule 1, clause 9(a); Schedule 2, clause 9(a); Schedule 3, clause 8(a); Schedule 4, clause 7(a); and Schedule 5, clause 7(a) should be revised to ensure consistency with clause 5.6 of the proposed revised template haulage contract.

Schedule 1, clause 9(c); Schedule 2, clause 9(c)(i); Schedule 3, clause 8(d); Schedule 4, clause 7(c); Schedule 5, clause 7(c) should all be deleted.

Required Amendment 29.
Clause 6.2 of the proposed revised template haulage contract should be deleted

Clause 6.5 of the proposed revised template haulage contract should be redrafted to ensure that ATCO retains liabilities for harm that arises from its own negligence or default.

Clause 6.6 of the proposed revised template haulage contract should be amended as follows:

(b) <Service Provider> will have no liability to <User> for any loss, damage, cost or expense <User> suffers or incurs in relation to or connection with such conveyance, where the loss, damage, cost or expense is a result of the gas being Off-specification Gas.

Required Amendment 30.
Clauses 6.5(a), 6.7(b), 6.8(b), 6.9(c)(ii) and 6.11(e)(ii) of the proposed revised template haulage contract should be amended to remove references to indirect damage.

Clause 18.3(b) should be deleted.

Required Amendment 31.
Clause 7.7(a) of the revised template haulage contract should be as follows:

(b) …by <Service Provider>, or its officers, servants, or agents acting reasonably in the ~~reasonable~~ course of installing…

Required Amendment 32.
Clause 8.1 of the proposed revised template haulage contract should be amended as follows:

8.1 <Service Provider> to minimise Curtailment

<Service Provider> will, in its operation and maintenance of the AGA GDS, use reasonable endeavours to minimise the magnitude and duration of any Curtailment of Gas deliveries to <User>, ~~except where the Curtailment is attributable to <User>'s negligence or breach of this Haulage Contract~~ subject to the service provider's rights to curtail deliveries under clauses 15.5(b), 16.1 and 16.2(i).

Required Amendment 33.
Either clause 10.3 or clause 19.1(c) of the proposed revised template haulage contract should be amended such that the threshold limits imposed under 19.1(c) do not apply to invoice disputes arising under clause 10.3.

Clause 10.4 of the proposed revised template haulage contract should be amended such that the same processes, rights and obligations applicable to user-issued retrospective

error notices provided for under 10.4(b) and 10.4(c) will apply for retrospective error notices issued by the service provider.

Required Amendment 34.
Clause 11.1 of the proposed revised template haulage contract should be deleted.

Clause 22.5(a) of the proposed revised template haulage contract should be amended to specify which duties it refers to and to ensure that the user's liability is limited to duties payable as a result of things done specifically pursuant to the bilateral relationship with the user.

Required Amendment 35.
Clauses 13.5(c) and 13.5(d) of the proposed revised template haulage contract should be deleted.

Required Amendment 36.
Clause 14.3(c)(iii) of the proposed revised template haulage contract should be deleted.

Required Amendment 37.
Clause 14.8 of the proposed revised template haulage contract should be amended as follows:

<Service Provider> may assign its rights or ~~novate~~ transfer its obligations under this Haulage Contract on giving reasonable written notice to <User>.

Required Amendment 38.
Either:

Clause 16.2 of the proposed revised template haulage contract should revert to the wording of clause 14.2 of the current template haulage contract;

Or:

Clause 16.2(a) of the proposed revised template haulage contract should be amended to limit ATCO's right to require a bank guarantee to those circumstances where ATCO might reasonably conclude that the user presents an unacceptable credit risk.

Required Amendment 39.
Clauses 18.1(a), (b), (c), (d), (f), (h), (j), (k), (l), (m), (n), (o), and (p) of the proposed revised template haulage contract should be deleted.

Clause 18 of the proposed revised template haulage contract should be amended to make the obligations imposed on the user in clauses 18.1(e) and (g) reciprocal.

Required Amendment 40.
Heading 21 should be amended as follows:

21~~. INTELLECTUAL PROPERTY,~~ CONFIDENTIALITY AND INFORMATION EXCHANGE

Clause 21.1 should be deleted.

Required Amendment 41.
Clause 4 of Schedule 4 and Schedule 5 of the proposed revised template haulage contract should be amended as follows:

(b) <Service Provider> must use ~~reasonable~~ best endeavours to read the Meter ~~approximately~~ at least every three months ~~4 times each Year at intervals of approximately 100 days~~.

(c) <Service Provider> must provide consumption data (estimated or actual) to the user at least every three months.

Required Amendment 42.
Clause 21.1 of the current version of the template haulage contract should be retained in the revised template haulage contract.

Clause 12.1 of the current access arrangement should retained in the revised access arrangement.

Both clauses should be revised, as necessary, to ensure that any shared terms are defined identically in both dictionaries.

Required Amendment 43.
Footnote 46 should be amended as follows:

ATCO Gas Australia operates a Guaranteed Service Level scheme which provides for compensation to Small Use Customers (as defined in s 3 of the Energy Coordination Act 1994 (WA)) who have been inconvenienced by disruption to their gas supply. ~~The specific requirements of this scheme are set out in the Authority's Gas Compliance Reporting Manual and are a condition of ATCO Gas Australia's Gas Distribution Licence (Clause 16 – Individual Performance Standards)) and a requirement of s 11M of the Energy Coordination Act 1994 (WA).~~

Required Amendment 44.
The term "pipeline service" should be replaced with the term "reference service" throughout the template haulage contract, except in the case of any specific provisions for which this would have unintended consequences.

The term "haulage service" should be replaced with the term "reference service" wherever it is intended for the provision to also apply to ancillary services.

The template haulage contract should be renamed "template service agreement" and any references to "template haulage contract" in other access arrangement documents should be amended as appropriate.

References to "haulage contracts" should be replaced with the phrase "service agreements" and any references to "haulage contracts" in other access arrangement documents should be amended as appropriate.

Required Amendment 45.
The revised wordings set out in Required Amendment 24 to Required Amendment 43 are to be read as if the substitutions described in Required Amendment 44 had been made.

Appendix 2 Abbreviations

Abbreviation	For
AA3	Third Access Arrangement Period (1 January 2010 to 30 June 2014)
AA4	Fourth Access Arrangement Period (1 July 2014 to 31 December 2019)
AA5	Fifth Access Arrangement Period
ABS	Australian Bureau of Statistics
ACT	Australian Competition Tribunal
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AGS	Australian Government Solicitor
ALARP	As Low As Reasonably Practicable
Alinta	Alinta Energy
AMP	Asset Management Plan
APIA	Australian Pipeline Industry
ATCO	ATCO Gas Australia Pty Ltd
ATO	Australian Taxation Office
AUC	Alberta Utilities Commission
AUD	Australian Dollars
CAM	Cost Allocation Methodology
CAPM	Capital Asset Pricing Model
CCA	Current Cost Accounting
CEG	Competition Economics Group
CGS	Commonwealth Government Securities
CoD	Cost of Debt
Compendium	Compendium of Gas Customer Licence Obligations
Core	Core Energy Group Pty Ltd
CPI	Consumer Price Index

CPUC	California Public Utilities Commission
DCF	Discounted Cash Flow
DGM	Dividend Growth Model
DPCR5	Fifth Distribution Price Control Review
DRP	Debt Risk Premium
EA	Enterprise Agreement
EBIT	Earnings Before Interest and Tax
ECS	Economics Consulting Services
EDD	Effective Degree Day
EGWWS	Electricity, Gas, Water and Waste Sector
EMCa	Energy Market Consulting associates
ERA	Economic Regulation Authority
FFM	Fama French Three Factor Model
FRC	Full Retail Contestability
FSA	Formal Safety Assessments
FTE	Full Time Equivalents
GBP	Great British Pound
GDS	Mid-West and South-West Gas Distribution System
GIS	Geographical Information Systems
GJ	Gigajoule
GST	Goods and Services Tax
HCA	Historical Cost Accounting
HDD	Heating Degree Day
HDF	Hastings Diversified Fund
HHV	Higher Heating Value
Incenta	Incenta Economic Consulting
IPART	Independent Pricing and Regulatory Tribunal
IPD	Implicit Price Deflators

IRS	Interest Rate Swaps
I-Tek	ATCO I-Tek Australia
IT	Information Technology
ITAA	Income Tax Assessment Act
ITAA97	Income Tax Assessment Act 1997
ITAA36	Income Tax Assessment Act 1936
ITSA	IT Service Agreement
Kleenheat	Wesfarmers Kleenheat Gas Pty Ltd
KPI	Key Performance Indicator
LRMC	Long Run Marginal Cost
MRP	Market Risk Premium
NDV	Network Data Visualisation
NERA	NERA Economic Consulting
NFC	Non-Financial Corporates
NGL	National Gas Law
NGL(WA)	National Gas Access (WA) Act 2009
NGO	National Gas Objective
NGR	National Gas Rules
NPV	Net Present Value
OEB	Ontario Energy Board
Ofgem	Office of Gas and Electricity Markets
PTRM	Post Tax Revenue Model
PWC	PricewaterhouseCoopers
QCA	Queensland Competition Authority
RAB	Regulatory Asset Base
RBA	Reserve Bank of Australia
REMCo	Retail Energy Market Company
RIIO	Revenue = Incentives + Innovation + Outputs

RORE	Return on Regulated Equity
Rules	Retail Market Rules
SAIFI	System Average Interruption Frequency Index
SFG	SFG Consulting
TAB	Tax Asset Base
THC	Template Haulage Contract
The Code	*National Third Party Access Code for Natural Gas Pipeline Systems*
TR	Taxation Ruling
UAFG	Unaccounted for Gas
UPSC	Utah Public Service Commission
USD	United States Dollars
VIX	Volatility Index
WACC	Weighted Average Cost of Capital
WAGN	WA Gas Networks Pty Ltd
WA Local Regulations	*National Gas Access (WA) (Local Provisions) Regulations 2009*
Wipro	Wipro Ltd
WPI	Wage Price Index

Appendix 3 International comparisons for the return on equity

1. This Appendix reports the return on equity provided by regulators overseas.

2. There are a number of definitions of the post tax WACC, each with a different implicit treatment of tax. The vanilla WACC is the appropriate comparator for cross-jurisdictional measures, as it is after company tax but before personal tax. Consistent with the definition, the Authority's estimate of the return on equity is the 'grossed up' vanilla WACC, which accounts for the impact of imputation credits (see paragraphs 778 to 784 of the draft decision).

Canadian and US gas distribution

3. Concentric Energy Advisors publish a comparative analysis of the return on equity of Canadian and United States gas and electricity utilities:[627]

   - Concentric examined the return on equity to 16 Canadian gas distributors, finding that the average return on common equity was 9.37 per cent in 2014. The corresponding average return for US gas distributors was 9.54 per cent in 2014.[628]
   - The average return for 13 Canadian electricity distributors was 8.89 per cent in 2014, whereas for the average return on all rate cases decided in 2014 for (an unspecified number of) US electricity distributors was 10.23 per cent.

Alberta Utilities Commission

4. The Alberta Utilities Commission (**AUC**) regulate two of the 16 gas distributors.

5. AUC's current estimate of the return on equity for all of the Alberta gas and electricity distributors is 8.75 per cent. This is a vanilla estimate, as taxes are estimated explicitly as a cashflow.[629] This is the figure reported by Concentric for ATCO Gas in Canada.

6. The AUC return on equity allowance includes 0.5 per cent for equity 'flotation' costs. The ERA includes Equity Raising Costs as a (capitalised) cash flow, so the comparison figure for the AUC would subtract off the 0.5 per cent, giving a comparable nominal vanilla return on equity of 8.25 per cent.[630]

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627 Concentric Energy Advisors, *Authorized Return on Equity for Canadian and U.S. Gas and Electric Utilities*, Volume II, 8 May 2014, www.ceadvisors.com/news/pdfs/ROE%20NewsletterVolumeII.pdf, accessed 9 June 2014.

628 US averages are quoted by Concentric from a report referenced SNL Financial LC's Regulatory Research Associates. Data for 2014 includes decisions through March 31, 2014.

629 Alberta Utilities Commission, *ATCO Pipelines. 2013-14 General Rate Application*, 4 December 2013, p. 72.

630 In what follows, the flotation rate of 0.5 per cent is subtracted off the ranges for the return on equity from both the CAPM and the DCF, to allow effective comparison with the Authority's rate.

7. This AUC estimate is based on judgment as to the best point estimate given other evidence within range for the CAPM return on equity in the range of 5.9 to 8.6 per cent, comprised of:[631]

   - a risk free rate of 3.4 to 3.8 per cent (per the 30 year bond yield for Canada bonds);
   - equity beta of 0.5 to 0.65; and
   - MRP of 5.0 to 7.25 per cent.

8. The AUC take account of a range of evidence on *industry* returns, including from the Dividend Growth Model (**DGM**), which is for 8.3 to 9.0 per cent.[632]

9. Taking the mid-point of the risk free rate (3.6 per cent), AUC have taken the top of both the CAPM equity beta range (0.65) and the MRP (7.25 per cent), to give the overall estimate of 8.25 per cent. The implied return on the market is 10.85 per cent.

10. Debt proportion is around 60 per cent (plus or minus 5 per cent depending on utility) in Canada.

11. ATCO's estimate of its 'embedded' cost debt is passed through.

Ontario Energy Board

12. The Ontario Energy Board (**OEB**) regulates two of the businesses in the Concentric average for Canada.

13. OEB bases its return on equity on a modified version of the CAPM, informed by other models, which are used to derive an equity risk premium over and above a risk free rate.[633] The overall rate of return is updated annually to account for changes in the long term bond yield.

14. Set in 2009, OEB's return on equity for its regulated utilities is based on:[634]

    - equity risk premium of 5.0 per cent – based on a range of estimates including CAPM, DCF, econometric models and other estimated spreads to the long term bond yield;[635] and
    - long term bond yield of 4.25 per cent (30 year bond);
    - to give a return on equity of 9.25 per cent (excluding 'transactional costs'.

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631 Alberta Utilities Commission, *2011 Generic Cost of Capital*, 8 December 2011. Note that the AUC's rate of return was unchanged in 2012 and 2013, and was extended on an interim basis for 2014 pending an update of the overall estimate (Alberta Utilities Commission, 2013 Generic Cost of Capital, 19 December 2013).

632 Called Discounted Cash Flow model by the AUC.

633 Ontario Energy Board, *Report of the Board on the Cost of Capital for Ontario's Regulated Utilities*, EB-2009-0084, 11 December 2009, p. 26.

634 Ontario Energy Board, *Report of the Board on the Cost of Capital for Ontario's Regulated Utilities*, EB-2009-0084, 11 December 2009, p. ii.

635 With 'transactional costs' of 0.5 per cent subtracted off as equity raising costs are not included in the ERA estimates.

15. OEB subsequently update the return on equity by an automatic adjustment mechanism that is based on *half of the changes* in the long term bond yield and the relevant credit spread. The ratio reflects an expectation that overall returns on equity do not move one for one with changes in the risk free rate. So for example, in 2013:

- long term Canada bond yields fell by 0.86 per cent from 2009 to be 3.4 per cent, reducing the return on equity by 0.43 per cent (half the decline);
- credit spreads on relevant A rated debt widened marginally from 2009, increasing the return by 0.03 per cent (half the increase); and
- the net effect of the two changes was a slight reduction in the overall rate of return from 9.25 per cent to 8.86 per cent, and an implicit change in the equity risk premium to 5.5 per cent.[636]

16. With beta around 0.6, the implied market risk premium would be 9.2 per cent.[637]

California Public Utilities Commission

17. The California Public Utilities Commission (**CPUC**) regulates four gas and electricity distributors. It sets a cost of capital every three years, which is then updated through an automatic cost of capital adjustment mechanism (a 0.5 proportion of the change in the risk free rate, similar to OEB's mechanism reported above, provided that the change in the risk free rate exceeds a 'deadband' of 100 basis points). Taxes are treated in the cashflows, so the return on equity is nominal vanilla.

18. On 12 December 2012, CPUC updated its cost of capital estimates (Table 76).

Table 76 Return on equity and return on the rate base

UTILITY	Return on Common Equity	Return on Rate Base	Reduction in Revenue Requirement
SCE[1]	10.45%	7.90%	$217 Million
SDG&E[2]	10.30%	7.79%	$ 34 Million
SoCalGas[3]	10.10%	8.02%	$ 22 Million
PG&E[4]	10.40%	8.06%	$237 Million

Source: California Public Utilities Commission, *Decision on Test Year 2013 Cost of Capital for the Major Energy Utilities*, 20 December 2012, docs.cpuc.ca.gov/PublishedDocs/Published/G000/M040/K655/40655308.pdf, p. 3.

19. The return on equity is based on CPUC's informed judgment drawing on estimates from the CAPM, the Risk Premium Model and the DCF model by both service

636 Again, with transaction costs subtracted off.

637 The market risk premium decision is not reported, although OEB report one expert's opinion that the MRP should be 0.5. The use of the 0.6 value here draws on the AUB's estimate.

providers and the Office of Ratepayer Advocates. CPUC rejected use of the Fama French model.[638]

20. For the CAPM, a range of results from stakeholders were considered by CPUC, with the average of the reported ranges being:[639]

- risk free rate of 3.3 per cent;
- beta of 0.9;
- MRP of 7.4 per cent;
- a resulting equity risk premium for the gas distribution businesses of around 6.4 per cent; and
- a resulting average return on equity of 9.4 per cent.

21. Southern California Edison have put in their proposal for 2015 in which they forecast virtually unchanged rates of return over the period 2015 to 2017.[640]

22. The debt proportion in the US for gas distribution utilities is generally 50 per cent, lower than Canadian or Australian gas utilities (where debt proportion is usually around 60 per cent).

New York Public Service Commission

23. The New York Public State Commission in 2014 determined a return on common equity for Consolidated Edison of 9.2 per cent for electricity distribution and 9.3 per cent for gas and steam distribution.[641]

Utah Public Service Commission

24. Utah Public Service Commission (**UPSC**) decisions are based on 'test period' for estimating the return on equity at the time of a 'general rate case'.

25. Gas distribution utility Questar's 2009 General Rate Case set a return on equity of 10.35 per cent, 'at the high end' of the range the UPSC considered reasonable.[642]

26. The main evidence for the rate of return in this rate case came from expert commentary on behalf of Questar:

- results were assessed for proxy company's (10 of the 18 publicly traded natural gas utility stocks listed on Value Line with ratings of BBB- or better);

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638 California Public Utilities Commission, *Decision on Test Year 2013 Cost of Capital for the Major Energy Utilities*, 20 December 2012, docs.cpuc.ca.gov/PublishedDocs/Published/G000/M040/K655/40655308.pdf, p. 3.

639 California Public Utilities Commission, *Decision on Test Year 2013 Cost of Capital for the Major Energy Utilities*, 20 December 2012, docs.cpuc.ca.gov/PublishedDocs/Published/G000/M040/K655/ 40655308.pdf, p. 25.

640 Southern California Edison, *Test Year 2015 General Rate Case Application (U 338-e)*, 12 November 2013.

641 State of New York Public Service Commission, *Case 13-E-0030 et al*, 21 February 2014, p. 14.

642 Public Service Commission of Utah, *Questar Gas Company 2009 General Rate Case*, Docket no. 09-057-16, 3 June 2010, p. 7.

- DCF analysis giving an expected return on equity of 10.2 per cent on average;
- the CAPM – 30 year treasury bond yield of 4.15 per cent, an MRP of 6.5 per cent and a (Blume adjusted) beta of 0.67, for a total return on equity of 8.47 per cent – but, as it was 2009, the proponent argued that no weight should be given to the result, which appears to have been accepted;
- a size premium added to the CAPM, based on Morningstar Ibbotson SBBI 2009 Valuation Yearbook adjustments for the size of market capitalisation gave an average return of 10.2 per cent;
- regression analysis for gas distribution companies and the 30 year treasury bond yield – 10.35 per cent;[643]
- regression analysis for gas distribution companies and yields on Baa corporate bonds – 10.42 per cent[644]; and
- other recent 2006 – 09 gas distribution general rate decisions in the US averaging 10.29 per cent.

27. The final rates in this case were set following a 'scheduling conference' of stakeholders.

United Kingdom

28. Ofgem's RIIO review determined its approach to the rate of return would be based on:
    - a real weighted average cost of capital;
    - a backward looking embedded cost of debt via a trailing average;
    - the use of the CAPM to determine the cost of equity, informed by other models; and
    - the use of return on regulated equity (RORE) analysis, developed in the fifth electricity distribution price control review (DPCR5), as a tool to check rates of return.[645]

29. For its recent gas distribution WACC decision, RIIO-GD1, Ofgem:[646]
    - set out an indicative range for the ***real*** post tax cost of equity of 6.0 to 7.2 per cent, with a central reference point of 6.7 per cent, based on 'long term estimates for the CAPM components;[647,648]

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643 Equals estimated intercept of 8.50 per cent plus 0.4428 * (observed treasury yield in per cent).

644 Equals estimated intercept of 7.44 per cent plus 0.4726 * (observed Baa yield in per cent).

645 The RORE assesses the potential range for the return on equity, for each regulated industry, if all incentives are achieved, or conversely if all penalties are realised. The RORE for the gas distribution networks ranged from around 4 per cent through to almost 11 per cent, which Ofgem consider 'is similar across sectors, and thus acts a sense check that our differential notional gearing and equity assumptions adequately capture the differences in cash flow volatility between the sectors' (Ofgem, *RIIO-GD1: Final Proposals - Overview*, 17 December 2012, p. 38).

646 Ofgem, *RIIO-GD1: Final Proposals - Overview*, 17 December 2012, p. 35.

647 Ofgem, *RIIO-GD1: Final Proposals – Finance and uncertainty supporting document*, 17 December 2012, p. 22.

648 Most recently, for RIIO-ED1, it has been proposed to reduce the cost of equity marginally, by 0.3 per cent (Ofgem, *Decision on our methodology for assessing the equity market return for the purpose of setting RIIO-ED1 price controls*, 17 February 2014, p. 1).

- real risk free rate of 2.0 per cent;
- equity beta of 0.9, considered to be conservative;
- market risk premium of 5.25 per cent;
- trailing average based on a 10 year trailing average of iBoxx indices for sterling-denominated corporate bonds – giving a pre-tax cost of debt of 2.92 per cent for 2013-14;
- debt proportion of 65 per cent; and
- for a resulting vanilla real WACC of 4.24 per cent.

30. Recent consumer price inflation in the United Kingdom has been running at an annualised 1.8 per cent. The Bank of England's target rate is 2.0 per cent. The resulting ***nominal*** return equivalents are:

- post tax cost of equity of 8.6 per cent, based on 'long term estimates for the CAPM components';[649,650]
- nominal risk free rate of 3.8 per cent;
- equity beta of 0.9, considered to be conservative;
- market risk premium of 5.25 per cent;
- trailing average based on a 10 year trailing average of iBoxx indices for sterling-denominated corporate bonds – giving a pre-tax cost of debt of 4.8 per cent for 2013-14;
- debt proportion of 65 per cent; and
- for a resulting vanilla WACC of 6.5 per cent.

649 Ofgem, *RIIO-GD1: Final Proposals – Finance and uncertainty supporting document*, 17 December 2012, p. 22.

650 Most recently, for RIIO-ED1, it has been proposed to reduce the cost of equity marginally, by 0.3 per cent (Ofgem, *Decision on our methodology for assessing the equity market return for the purpose of setting RIIO-ED1 price controls*, 17 February 2014, p. 1).

Appendix 4 Which factors are priced – an application of the Fama French 3-factor model in Australia?

Introduction

1. Australian regulators including the Economic Regulation Authority (**ERA**) have not used the Fama French three-factor model (**FFM**) or any multi factor model to estimate a return on equity in their regulatory decisions. This decision is mainly based on considerations that there is no strong theoretical basis to support the inclusion of the additional risk factors, being a size factor (**SMB**) and a value factor (**HML**), in a rate of return on equity. This is because the FFM is dependent on empirical justification - that is, the systematic observance of the FFM risk premia. In addition, since the FFM risk premia are not systematically observed in the Australian market, there is no reasonable basis for the FFM to be applied in Australia. For example, analysis from Australia, which is the relevant market for funds in the Australian regulatory decisions, shows that observed empirical evidence is not consistent with the FFM, with conflicting, variable FFM risk premia and inconsistent FFM factor coefficients. Australian regulators also note that while the FFM has achieved a degree of support in academic circles, there has also been scepticism due to concerns about 'data mining',[651] that is, the reporting of results of strong correlations between variables, without the benefit of *a priori* theory justifying the inclusion of those variables.

2. Even though in the US market where the FFM was developed, analysis shows conflicting evidence that does not support the FFM for each time period analysed. As an illustration, a study from Kothari, Shanken, and Sloan study[652] in 2005 concluded that the FFM's statistical tests were of too low power. These authors are of the view that the economic magnitude of firm size is quite small and that the book-to-market premia could be a result of survivorship bias.[653]

3. In addition, FFM has not been widely used by financial analysts and business practitioners in Australia in valuation and capital budgeting. A practical reason for this is that values of the 'theta factor' (i.e. the input factors) are not commercially available in Australia. In regulatory decisions, Australian regulators considered that while the FFM continues to be considered in finance textbooks, it is used as an illustration of the potential limitations of the Sharpe-Lintner CAPM, and not because it is widely applied in business. The summary below from a leading corporate

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651 Data mining can lead to spurious correlation between variables. Data mining is the process in which the researcher will keep adding explanatory variables to a model, or adjusting the form of the model, until a statistically significant relationship is found. This process can generate spurious relationship between variables because one is bound, sooner or later, to find a variable that is associated with another, maybe for no other reason than accident (Melberg, H, 2000, "From spurious correlation to misleading association", the University of Oslo).

652 Kothari, S., Shanken, R., Sloan, R. (1995), "Another look at the Cross-section of expected returns", *Journal of Finance,* December 1995.

653 Survivorship bias is the tendency for failed companies to be excluded from performance studies because they no longer exist. It often causes the results of studies to skew higher because only companies which were successful enough to survive until the end of the period are included. This is a type of selection bias.

finance book[654] written by practitioners confirms the fact that FFM is not a well-accepted model:

4. "The bottom line? It takes a better theory to kill an existing theory, and we have yet to see a better theory. Therefore, we continue to use the CAPM while keeping a watchful eye on new research in the area."

5. Recent developments on the issue have attracted attention from regulated businesses and regulators. Professor Fama, one of the three recipients, was awarded a Nobel Prize in Economics in 2013 for his contribution on empirical studies on asset pricing. In addition, there are recent empirical academic papers to conclude that the FFM model works better than the Sharpe-Lintner CAPM in the Australian context.

6. This study represents a replication of the Fama and French (1993) study using Australian data drawn from a very recent period, from 2009 to 2014. Key differences among Australian applications of the FFM are drawn into this study. The key rationale for this study to be conducted is to consider how robust the estimated coefficients for FFM risk premia are under various scenarios and approaches to portfolio formation adopted in previous empirical studies in Australia and overseas.

The Fama French three-factor model

7. In their various empirical studies, Fama and French (1992, 1993, and 1996) concluded that the cross-sectional variation in returns is not well explained by beta alone. This finding is inconsistent with the conclusion from the capital asset pricing (CAPM) model developed by Sharpe and Lintner in 1964 and 1965, which proposes beta as the sole explanatory factor of asset returns. The central prediction of the model is that the market portfolio of invested wealth is mean-variance efficient in the sense of Markowitz (1959). The efficiency of the market portfolio implies that (i) expected returns on securities are a positive linear function of their market beta (the slope in the regression of a security's return on the market's return), and (ii) market beta is sufficient to describe the cross-section of expected returns.

8. The Fama-French three-factor is argued to identify three sources of un-diversifiable risk which are able to explain the average returns:

   - The excess return to the market portfolio (the market risk premium, MRP);
   - The value or growth risk premium, high minus low (**HML**) – the premium earned by high minus low book value shares. In this asset pricing model, high-value firms have a high ratio between book value of equity and market value of equity whereas the opposite is true for low-value firms (also known as growth shares);
   - The size risk premium, small minus big (**SMB**) – the premium earned by small minus big shares. Small (big) firms have small (big) total capitalisation (i.e. equity at market value).

$$r_e = r_f + \left(E\left(r_M\right) - r_f\right) \times \beta_m + SMB \times s + HML \times h$$

where:

[654] Koller, T.; Goedhart, M.; Wessels, D. *Valuation: Measuring and Managing the Value of Companies*, (University Edition), John Wiley & Sons, 4th Edition, 2005, p. 324.

r_e is the return on equity

$E\left(r_M - r_f\right)$ is the market risk premium (**MRP**)

$\beta_m; h; s$ are coefficients for the MRP; the mimicking size portfolio and the mimicking book-to-market portfolios.

9. The FFM states that small firms and firms with high book-to-market ratios require additional returns to compensate investors for the additional risks. Accordingly, large firms and firms with a low book-to-market ratio have less risk and therefore investors require a lower rate of return. In their 1992 paper, Fama and French argued that two easily measured variables, size (ME) and book-to-market equity (BE/ME), provide a simple and powerful characterization of the cross-section of average stock returns for the 1963-1990 period.

10. As a result, the following expectations are derived from the FFM:

- *First*, the estimated coefficient of alpha (a constant) should be statistically insignificant from all formed portfolios.
- *Second*, the three estimated coefficients on the MRP; SMB; and HML carry a positive sign. This means that MRP; SMB; and HML are positively correlated with a return on equity.
- *Third*, these three estimated coefficients should be statistically significant.

Applications of the Fama French three-factor model: Australian empirical studies

11. There have been various attempts to apply the Fama French three-factor model in Australia using Australian data. It is noted that the results from these studies are mixed. Table 77 shows that the ranges of the HML risk premia, from 14.6 per cent to 6 per cent, and of SMB risk premia, from 17.2 per cent to -9 per cent, can be considered too large to confirm the presence of the risk factors when using the FFM in Australia.

12. The FFM predicts that the HML and SMB coefficients estimated from the models should be significantly different from zero. On this prediction, findings from Australian studies indicate that many estimates are not statistically significant. In addition, the FFM also predicts that the intercept from the regression, which is the proportion of the observed return that is not explained by the FFM, should not be significantly different from zero. While there are some studies where the FFM performs well, such as Ghargori, Chan and Faff (24 out of 27 portfolios have intercepts that are not statistically significant from zero), there are studies where the FFM performs poorly, such as Ghargori, Lee and Veeraghavan (only 2 out of 12 portfolios have intercepts that are not statistically significant from zero).

Table 77 Applications of the Fama-French three-factor model in Australia

Authors	Years	Risk premia		FFM's parameter analysis		
		HML (%)	SMB (%)	Intercept not significant	HML coefficients significant	SMB coefficients significant
Fama & French, 1998[655]	1975-1995	12.3	N/A	N/A	N/A	N/A
Halliwell et al., 1999[656]	1980-1991	14.6	6.0	23 of 25	6 of 25	18 of 25
Faff, 2001[657]	1991-1999	14.0	-9.0	20 of 24	7 of 24	11 of 24
Faff, 2004[658]	1996-1999	6.0	-6.5	19 of 24	14 of 24	18 of 24
Gaunt, 2004[659]	1993-2001	8.5	10.0	19 of 25	21 of 25	13 of 28
Ghargori, Chan & Faff, 2007[660]	1996-2004	10.4	17.2	24 of 27	20 of 27	14 of 27
O'Brien et al., 2008[661]	1982-2006	9.4	4.3	14 of 25	22 of 25	16 of 25
Kassimatis, 2008[662]	1993-2005	12.6	11.5	11 of 25	20 of 25	11 of 25
Ghargori, Lee & Veeraghavan, 2009[663]	1993-2005	N/A	N/A	2 of 12	10 of 12	5 of 12
Brailsford; Gaunt & O'Brien, 2012[664]	1982-2006	9.1	-2.6	24 of 25	15 of 25	22 of 25
Brailsford; Gaunt & O'Brien, 2012[665]	1982-2006	12	N/A	Varies depending on the approach of portfolio formation		

Source: Economic Regulation Authority, Draft Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline, 14 March 2014, Table 30 and recently updated.

655 Lajbcygier P. And S. M. Wheatley, *An evaluation of some alternative models for pricing Australian stocks*, Working Paper, Monash University, 2009.

656 J. Halliwell, R. Heaney and J. Sawicki, 'Size and book to market effects in Australian share markets: a time series analysis', *Accounting Research Journal*, 1999, vol. 12, pp. 122–137.

657 R. Faff, 'An examination of the Fama and French three-factor model using commercially available factors', *Australian Journal of Management*, 2001, vol. 26, pp. 1–17.

658 R. Faff, 'A simple test of the Fama and French model using daily data: Australian evidence', *Applied Financial Economics*, 2004, vol. 14, pp. 83–92.

659 Gaunt, 'Fama–French model: Australian evidence', *Accounting and Finance*, 2004.

660 P. Gharghori, H. Chan and R. Faff, 'Are the Fama–French factors proxying default risk?', *Australian Journal of Management*, December 2007, vol. 32(2), pp. 223–249.

661 O'Brien, Brailsford, and Gaunt, 'Market factors in Australia', Australasian Finance and Banking Conference, 2008.

13. A significant and fundamental issue in the applications of the FFM in Australia is to adopt different approaches to portfolio formation. It is argued that different methods of portfolio formation lead to different conclusions. In addition, there is no strong theory to guide the method of portfolio formation given the inherent empirical nature of this type of study. As a result, studies have tended to follow previous work to determine the way in which stocks are allocated into different portfolios.

Various approaches to portfolio formation

14. Table 78 below presents different approaches adopted in Australian studies to form portfolios. For convenience, approaches of portfolio formation in three initial studies conducted by Fama and French are also included.

Table 78 Various approaches to portfolio formations

Study	Approach
Fama French 1992	In June of each year, all NYSE stocks are sorted by size (ME) to determine the NYSE decile breakpoints for ME. NYSE, AMEX, and NASDAQ stocks are then allocated to 10 size portfolios based on the NYSE breakpoints. Size breakpoints are determined by sorting NYSE stocks by market capitalization. BM breakpoints are determined by sorting NYSE stocks by BM. These breakpoints are then applied to all stocks from NYSE, AMEX and Nasdaq.
Fama French 1993	Six portfolios to mimic the underlying risk factors in returns related to size and book-to-market equity. Stocks are allocated into three book-to market equity groups based on the breakpoints for the bottom 30% (Low), middle 40% Medium) and top 30% (High) of the ranked values of ***BE/ME*** for NYSE stocks. For size factor, the entire market is allocated into only 2 groups (Big and Small) based on the market cap. Stocks are allocated in to five size quintiles and five book-to-market quintiles. 25 portfolios are constructed from the intersections of the size and BE/ME quintiles.
Fama French 2006	As in Fama French 1993.
Halliwell et al., 1999	Companies are formed into 25 portfolios. These portfolios are formed by first dividing companies into 5 groups based on their size. The companies are then independently sorted into five groups based on their *BIM* ratio.
Faff 2001 & 2004	Four of the Australian equity 'style' indexes produced by the Frank Russell Company using ASX data including the style indexes chosen are: (a) the ASX/Russell Value 100 Index; (b) the ASX/Russell Growth 100 Index; (c) the ASX/Russell Small Value Index; and (d) the ASX/Russell Small Growth Index are used. The industry portfolio data represent the 24 Australian Stock Exchange (ASX) indexes.
Gaunt 2004	For size factor, based on market cap, stocks are broken into five (quintile) size groups with an equal number of stocks in each group. Independently, the sample is ranked by BM. BM is calculated as shareholder equity divided For value factor, stocks are broken into five groups with an equal number of stocks in each group with quintile 1 being the smallest book to market (glamour) stocks and quintile 5 being the largest (value) stocks.

662 K. Kassimatis, 'Size, book to market and momentum effects in the Australian stock market', *Australian Journal of Management*, June 2008, vol. 33(1), pp. 145–168.

663 P. Gharghori, R. Lee and M. Veeraraghavan, 'Anomalies and stock returns: Australian evidence', *Accounting and Finance*, 2009, vol. 49, pp. 555–576.

664 Brailsford, T., Gaunt, C., and O'Brien, M. (2012), 'Size and book-to-market factors in Australia", *Australian Journal of Management*, 2012, vol. 37, pp. 261-81.

665 Brailsford, T., Gaunt, C., and O'Brien, M. (2012), 'The investment value of the value premium", *Pacific-Basin Finance Journal*, 2012, vol. 20, pp. 416-37.

Study	Approach
Ghargori, Chan & Faff, 2007	Firms are sorted into two size groups (Small and Big) and three book to- market groups (High, Medium and Low) using a 30–40–30 split. Six portfolios are formed from the intersection of the two size and three book-to-market groups. Firms are then allocated into three groups according to a 33%:33%:33% partition and 27 portfolios are formed from the intersection of the three size, three book-to-market, and three DP groups.
O'Brien et al., 2008	For size factor, each firm is ranked at the end of each December by their book-to-market ratio and assigned to one of five book-to-market portfolios, where each portfolio contains an equal number of stocks. Independently, each firm is ranked by market capitalisation again at the end of each December, and assigned to one of five size portfolios, where each portfolio contains an equal number of stocks.
Kassimatis 2008	The 25 portfolios are the intersection of each BM quintile portfolio with each of the size quintile portfolios For the market portfolio, rather than using the All Ordinaries Accumulation Index which includes only the largest 250 companies of the Australian market, a value weighted portfolio of all the stocks in the sample is used.
Ghargori, Lee & Veeraghavan, 2009	The Fama–French factors are constructed by dual sorting on size and tri-sorting on book-to-market. Sextiles are chosen - the sorting on the test portfolios is at least twice as fine as the sorting used to construct the Fama–French factors.
Brailsford; Gaunt & O'Brien 2012a	The 200 largest firms by market capitalization are ranked at the end of each December by their book-to-market ratio and assigned to one of five book-to-market portfolios, where each portfolio contains an equal number of stocks. These breakpoints are then stored and used to assign all other listed firms into five portfolios. Independently, each firm is ranked by market capitalization again at the end of each December, and assigned to one of five size portfolios. The largest firms that make up 75% of total market capitalization are assigned to portfolio 1 (large). The next set of firms that make up the next 15%; 5%; 3% and the rest of total market capitalization are assigned to portfolios 2; 3; 4; and 5 respectively.
Brailsford; Gaunt & O'Brien 2013b	All firms on the ASX are ranked by market capitalization (largest to smallest) and the first n number of firms that make up 90% of total market capitalization are assigned to the big portfolio. All other firms are assigned to the small portfolio. Independently, the top 200 firms by market capitalization are ranked by their book-to-market ratios. The first 30% of firms with the lowest book-to-market ratios are assigned to the low portfolio. The next 40% of firms based on book-to-market ratio are assigned to the neutral portfolio and finally the 30% of firms with the highest book-to-market are assigned to the high portfolio. These book-to-market breakpoints are recorded and used to assign all other firms outside the top 200 into the three book-to-market portfolios. This leads to all stocks being assigned to one of two size portfolios and one of three book-to-market portfolios, giving a total of six portfolios.

Source: Compiled from various papers

15. In applying the Fama French 3 factors model in different countries/ periods of time, various empirical studies have adopted different proxies and different approaches to portfolios formation. Differences in adopting proxies (for the risk free rate and the market) are not considered. A key focus is on different approaches to portfolio formation as discussed in the 2012 paper by Brailsford; Gaunt & O'Brien. Each of these 5 portfolios formations is summarised as below.

Table 79 Proposed approaches to portfolio formations adopted in this study

Approach	Explanation
1	All stocks are ranked by size and sorted in five portfolios with each portfolio containing the same number of stocks. Stocks by book-to-market ratios (lowest to highest) are ranked and quintile portfolios of equal numbers of stocks are formed.
2	Each firm (largest to smallest) by market capitalization is ranked and then assigned to one of five size portfolios. The largest size portfolio contains the first n number of stocks that make up 75% of total market capitalization. The second portfolio contains the next n number of stocks that make up the next 15% of total market capitalization. The next 3 portfolios contain the next 5%; 3%; and 2% of total market capitalization. These market capitalization breakpoints are argued to parallel the findings of Fama and French (2006). For value factor, portfolios are constructed using book-to-market breakpoints determined on the basis of sorts on the top 200 stocks and subsequently applied to the full sample of stocks.
3	For a size factor, each stock is first ranked by market capitalization (largest to smallest). The largest size portfolio contains the largest 50 stocks. The second size portfolio contains the next 150 stocks (i.e. stocks 51-200). The third and fourth size portfolio contains the next 100 and stocks. The fifth size portfolio contains all other listed stocks. For a value factor, breakpoints for book-to-market value are determined on the basis of the top 200 stocks and then applied to the full sample of stocks.
4	For a size factor, the approach is similar to Approach 3. However, for a value factor, this approach adopts an allocation in which stocks are allocated into quintile portfolios where each portfolio contains the same number of stocks.
5	Method 5 is the same portfolio construction approach as Method 4 but on a reduced sample of stocks. Specifically, stocks with a price of less than $0.20 are excluded from the sample.

Source: Brailsford; Gaunt & O'Brien, 2012b

Data, mimicking portfolios returns, and various scenarios

Data

16. As a standard Australian regulatory control period is 5 years, estimates of parameters in the calculation of a rate of return are generally conducted every 5 years. As such, daily data of stock and market returns for the 5 year period from 1 July 2009 to 31 May 2014 are adopted.

Estimating returns for the size factor and the value factor in mimicking portfolios

17. Fama and French (1992) used the market value of a stock at time t-1 to determine size at time t. This means that a firm's size is determined based on its market value of a previous year. In this study, a market cap for a firm (or a stock) on a day is determined based on the number of stocks outstanding in the market on the day and the closing price of a stock. As such, stocks with market caps which are lower than the average of the market cap for the entire market are allocated into a small-sized portfolio (Small - S). In addition, stocks with market caps which are higher than the average of the market cap for the entire market are allocated into a big-sized portfolio (Big - B).

18. A book-to-market (B/M) ratio for each stock is estimated based on a ratio between; (i) a book value of an equity; and (ii) its market value. A book value of equity is

collected from a firm's financial statements for a previous year, year t-1. All stocks are ranked based on their B/M ratio. Thrity per cent of all stocks with lowest B/M ratios will be allocated in the low B/M ratio (Low - L); 40 per cent of all stocks with next B/M ratios will be allocated in the medium B/M ratio; and 30 per cent of all stocks with highest B/M ratios will be allocated in the high B/M ratio (High - H).

19. Fama and French (1993) clearly indicated that the intersection between the two size portfolios and the three B/M ratio portfolios will form the following 6 portfolios in which the returns on the SMB and HML rnimicking portfolios in each period can be calculated:

- SH: a portfolio including stocks with *small size* and *high B/M ratio*.
- SM: a portfolio including stocks with *small size* and *medium B/M ratio*.
- SL: a portfolio including stocks with *small size* and *low B/M ratio*.
- BH: a portfolio including stocks with *big size* and *high B/M ratio*.
- BM: a portfolio including stocks with *big size* and *medium B/M ratio*.
- BL: a portfolio including stocks with *big size* and *low B/M ratio*.

20. For a size factor (SMB factor), SMB is estimated as an excess of a daily average return from stocks with small size (SH, SM, SL) and stocks with big size (BH, BM, BL):

$$\mathrm{SMB} = \frac{\mathrm{SH} + \mathrm{SM} + \mathrm{SL}}{3} - \frac{\mathrm{BH} + \mathrm{BM} + \mathrm{BL}}{3}$$

21. For a value factor (a HML factor), HML is estimated as an excess of a daily average return from stocks with high B/M ratio (SH, BH) and stocks with low B/M ratio (SL, BL):

$$\mathrm{HML} = \frac{\mathrm{SH} + \mathrm{BH}}{2} - \frac{\mathrm{SL} + \mathrm{BL}}{2}$$

Econometric approach

22. The approach proposed by Fama and Macbeth (1973) - the two-stage cross-sectional regression technique, followed by Brailsford; Gaunt & O'Brien (2012b), is adopted. In the first stage, coefficients for the market risk premium, SMB and HML are estimated using the time series regression.

$$R_{p,t} - R_{f,t} = \alpha_p + \beta\left(R_{m,t} - R_{f,t}\right) + s \times SMB_t + h \times HML_t$$

23. In the second stage, a single cross-sectional regression of mean excess returns on the factor coefficients from the first stage, are estimated.

$$\overline{R}_{p,t} - \overline{R}_{f,t} = \lambda_p + \lambda_\beta \beta + \lambda_s s + \lambda_h h$$

24. Fama and Macbeth argued that if a factor is priced then the estimated coefficient in the second stage regression will be statistically significant.

A various scenario approach

25. Three different scenarios are developed to consider how robust the estimates from the model are in the Australian context. It is noted that by using three different scenarios, it is not expected to produce the same or similar findings in terms of the magnitude of the estimated coefficients. Rather it is expected that all three expectations from the Fama French three-factor model are met in the Australian context including estimated coefficients of alphas are not statistically significantly and those of SMB and HML are positive and statistically significant. Each of these three scenarios is as follows.

Scenario 1:

26. Daily data for all listed firms in Australia as at 31 December each year (except for 2014 which is at 31 May 2014) during the period of 5 years, from 1 June 2009 to 31 May 2014. In this scenario, six sub samples are formed for 2009 (7 months) and 2014 (5 months) and the full 12 months for each year within the period from 2010 to 2013.

Scenario 2:

27. Daily data for all listed firms in Australia as at 31 May 2014. In this scenario, a number of listed firms in a sample in each year during the 5 year period from 1 June 2009 to 31 May 2014 remains the same.

Scenario 3:

28. This scenario is similar to Scenario 2. The only difference is that the number of shares traded (not the number of shares outstanding in Scenario 2) in the market on the day is used to calculate the market capitalisation of the firm.

Empirical results

29. A summary of the findings from this study under three different scenarios and five approaches to portfolio formation is presented in Table 80 below. A full result of the study can be found in the section below entitled ‘Tables to Appendix 4’.

Table 80 The results

Scenario	Approach to portfolio formation	FFM's parameter analysis		
		Intercept not significant	HML coefficients significant	SMB coefficients significant
Scenario 1	1	25	16	25
	2	25	15	25
	3	25	18	25
	4	25	17	25
	5	25	22	25
Scenario 2	1	14	21	25
	2	11	22	25
	3	13	22	25
	4	14	21	25
	5	25	19	25
Scenario 3	1	10	17	16
	2	12	16	15
	3	9	15	13
	4	11	16	12
	5	24	18	16

Source: Economic Regulation Authority's analysis.

30. Key findings from this empirical study can be summarised as below.

- *First*, the findings from this study indicate that while the size factor (SMB) may be priced well in the Australian context, the value factor (HML) provides a very mixed result.
- *Second*, all estimated coefficients on beta (a single factor under the CAPM) are statistically significant and they carry "correct" sign as expected across all 5 portfolio formations and under all three different scenarios.
- *Third*, the risk premium for the two additional factors, the SMB and the HML, vary significantly across portfolios depending on the way portfolios are formed and the scenarios being considered.
- *Fourth*, ignoring the use of different proxies, adopting different approaches to portfolio formulation will result in different findings of the model both in terms of expected sign for the estimated coefficients and statistically significant estimated coefficients.
- *Fifth*, under the three scenarios considered, the estimated coefficients for both SMB and HML factors vary significantly. Some of the coefficients from various

portfolios carry a different sign as expected and/or the estimated coefficients are not statistically significant.

31. The second stage, a single cross-sectional regression of mean excess returns on the factor coefficients from the first stage, is then conducted. The results for this stage using Australian data under Scenario 1 are presented in Table 81 below.

Table 81 The results of the second stage for Scenario 1

Method	λ_0	λ_β	λ_s	λ_h	Adj.R^2
Method 1	0.0067 (0.2199)	-0.0034 (0.5043)	0.0014 (0.0000)***	-0.0019 (0.0000)***	88.63%
Method 2	0.0116 (0.0288)**	-0.0085 (0.0641)*	0.0016 (0.0000)***	-0.0019 (0.0000)***	94.21%
Method 3	0.0098 (0.0485)**	-0.0067 (0.1215)	0.0015 (0.0001)***	-0.0020 (0.0000)***	93.71%
Method 4	0.0086 (0.0300)**	-0.0052 (0.1351)	0.0013 (0.0004)***	-0.0018 (0.0000)***	92.34%
Method 5	-0.0029 (0.4775)	0.0042 (0.2504)	0.0004 (0.1401)	-0.0021 (0.0000)***	92.60%

Source: Economic Regulation Authority's analysis.

32. The findings from this second stage regression indicate that the coefficients on HML are all statistically significant at 1 per cent level of significance. However, these coefficients are all negative which is not an expectation from the Fama French three-factor model and findings from the recent Australian study by Brailsford; Gaunt & O'Brien (2012b). In addition, the findings are mixed for estimated coefficients on the market risk premium and SMB and alphas. To a certain extent, the findings from this study are similar to the study by Core et al. (2008) for the US. In this US study, the authors concluded that the coefficients on the market risk premium and SMB to be insignificant but the intercept and the coefficient on HML to be positive and significant.

Conclusions

33. This empirical study aims to apply the Fama French three-factor model in the Australian context using the most recent data for the period of 5 years from July 2009 to May 2015. The findings from this study under various scenarios and various approaches to portfolio formations are mixed. Fundamental expectations from the Fama French three-factor model in terms of the insignificance of the estimated coefficients on alphas, the significance and positivity of the coefficients on the market risk premium; the SMB and the HML are not met in this study. As such, a claim from a recent study in Australia that for the first time, Fama French three-factor model produces a consistent outcome is simply exaggerated. It can be argued that this recent and new finding is an outcome of another "data mining" exercise, which is a common criticism of the Fama French three-factor model.

34. The contributions of this study can be summarised as below.

35. First, the study utilises the most recent data for the 5 year period from 1999 to 2014. The 5-years is generally a standard regulatory period in Australia. The data ends on 31 May 2014.

36. Second, it was argued that using daily data may better reflect the dynamics of the Australian equity market. No Australian empirical studies on the issue have adopted daily data. This study used daily data of all Australian listed stocks.

37. Third, one of the fundamental differences between the Australian empirical studies on the FFM is the method used to form various mimicking portfolios used in the FFM. This study applies the various different ways of portfolio formulation, as well as some new methods obtained from other empirical studies on the applications of the FFM in other countries – to the same dataset – in order to consider whether or not the findings are robust.

38. Fourth, various scenarios have been evaluated to check the robustness of the estimates using Australian data.

39. Fifth, this study provides further evidence to the debate on the adoption of an appropriate model to estimate the return on equity for future regulatory decisions in Australia. It is argued that the use of Australian data provides a further response to the accusation of data mining. If the FFM is itself robust, replication of similar results in different markets is suggestive of a more pervasive asset pricing effect than might be the case if the results were only observed in the USA.

Tables to Appendix 4

Scenario 1 - Method 1

α	Growth	2	3	4	Value
Big	0.0005 0.7032	-0.0003 0.7849	0.0004 0.7375	-0.0003 0.7889	0.0002 0.8887
2	0.0004 0.7901	-0.0001 0.9671	0.0005 0.6819	-0.0001 0.9360	0.0005 0.7103
3	-0.0001 0.9566	-0.0003 0.8102	0.0000 0.9946	-0.0003 0.8318	0.0003 0.8111
4	-0.0009 0.5644	-0.0008 0.5588	-0.0001 0.9457	-0.0012 0.3867	-0.0002 0.9105
Small	0.0012 0.4300	0.0012 0.2991	0.0012 0.3532	0.0006 0.6030	0.0007 0.6163

β	G	2	3	4	V
B	1.0706 (0.0000)***	1.1121 (0.0000)***	1.0509 (0.0000)***	1.0916 (0.0000)***	1.065 (0.0000)***
2	1.0500 (0.0000)***	1.0448 (0.0000)***	1.0311 (0.0000)***	1.0362 (0.0000)***	1.0738 (0.0000)***
3	1.0599 (0.0000)***	1.0198 (0.0000)***	1.0030 (0.0000)***	1.0320 (0.0000)***	1.0420 (0.0000)***
4	1.0645 (0.0000)***	1.0708 (0.0000)***	1.0073 (0.0000)***	1.0657 (0.0000)***	1.0593 (0.0000)***
S	0.9931 (0.0000)***	1.0691 (0.0000)***	1.0486 (0.0000)***	1.0715 (0.0000)***	1.0544 (0.0000)***

s_i	G	2	3	4	V
B	1.2635 (0.0000)***	1.1521 (0.0000)***	1.1286 (0.0000)***	1.3477 (0.0000)***	1.4947 (0.0000)***
2	1.6396 (0.0000)***	1.2973 (0.0000)***	1.3678 (0.0000)***	1.4725 (0.0000)***	1.6735 (0.0000)***
3	2.0049 (0.0000)***	1.5981 (0.0000)***	1.6335 (0.0000)***	1.7146 (0.0000)***	1.8499 (0.0000)***
4	2.5874 (0.0000)***	2.148 (0.0000)***	1.9286 (0.0000)***	2.2289 (0.0000)***	2.4757 (0.0000)***
S	2.7612 (0.0000)***	2.2127 (0.0000)***	2.1941 (0.0000)***	2.6511 (0.0000)***	2.7721 (0.0000)***

h_i	G	2	3	4	V
B	-1.4652 (0.0000)***	-1.2063 (0.0000)***	-0.5093 (0.0586)*	-0.0658 0.8121	0.3614 0.1843
2	-1.1673 (0.0002)***	-1.0672 (0.0000)***	-0.2417 0.3880	0.0533 0.8556	0.6220 (0.0383)**
3	-1.2292 (0.0000)***	-1.1163 (0.0002)***	-0.4266 0.1395	0.1360 0.6395	0.4031 0.1826
4	-1.4722 (0.0000)***	-0.9409 (0.0011)***	-0.0646 0.8235	0.0794 0.7860	0.7547 (0.0126)**
S	-2.6357 (0.0000)***	-1.5269 (0.0000)***	-1.2654 (0.0000)***	0.2009 0.4350	1.1003 (0.0000)***

R^2	G	2	3	4	V
B	52.74%	58.87%	50.98%	54.88%	58.17%
2	52.40%	52.06%	53.99%	53.51%	59.00%
3	55.80%	51.78%	54.42%	57.63%	59.09%
4	62.20%	62.58%	59.96%	65.54%	71.39%
S	65.53%	69.19%	69.01%	81.47%	80.89%

Scenario 1 - Method 2

α	Growth	2	3	4	Value
Big	0.0005 0.6826	-0.0003 0.8101	-0.0001 0.9428	-0.0008 0.5701	-0.0002 0.8761
2	0.0002 0.8539	-0.0009 0.4407	-0.0003 0.7910	-0.0005 0.6574	0.0003 0.8332
3	0.0005 0.7108	-0.0003 0.8145	0.0003 0.7959	0.0000 0.9844	0.0008 0.5811
4	0.0005 0.7092	0.0000 0.9726	-0.0001 0.9623	-0.0005 0.7061	0.0002 0.8839
Small	0.0001 0.9291	0.0002 0.8698	0.0002 0.8845	0.0001 0.9142	0.0002 0.8966

β	G	2	3	4	V
B	1.0118 (0.0000)***	1.0945 (0.0000)***	1.0654 (0.0000)***	1.083 (0.0000)***	1.0332 (0.0000)***
2	1.0677 (0.0000)***	1.1142 (0.0000)***	1.082 (0.0000)***	1.0985 (0.0000)***	1.0753 (0.0000)***
3	1.0526 (0.0000)***	1.1195 (0.0000)***	1.053 (0.0000)***	1.1022 (0.0000)***	1.0757 (0.0000)***
4	1.0422 (0.0000)***	1.0485 (0.0000)***	1.0438 (0.0000)***	1.0624 (0.0000)***	1.0492 (0.0000)***
S	1.06 (0.0000)***	1.0458 (0.0000)***	1.0413 (0.0000)***	1.0479 (0.0000)***	1.0468 (0.0000)***

s_i	G	2	3	4	V
B	1.7165 (0.0000)***	1.3616 (0.0000)***	1.5337 (0.0000)***	1.7628 (0.0000)***	2.0717 (0.0000)***
2	1.7607 (0.0000)***	1.2406 (0.0000)***	1.5429 (0.0000)***	1.5001 (0.0000)***	1.8548 (0.0000)***
3	1.6603 (0.0000)***	1.18 (0.0000)***	1.3202 (0.0000)***	1.4202 (0.0000)***	1.7464 (0.0000)***
4	1.5975 (0.0000)***	1.222 (0.0000)***	1.3408 (0.0000)***	1.3906 (0.0000)***	1.6218 (0.0000)***
S	2.2658 (0.0000)***	2.1825 (0.0000)***	2.2419 (0.0000)***	2.2752 (0.0000)***	2.2713 (0.0000)***

h_i	G	2	3	4	V
B	-2.2930 (0.0000)***	-1.1371 (0.0000)***	-0.2635 0.3145	0.5310 (0.0487)**	0.5400 (0.0783)*
2	-2.3271 (0.0000)***	-1.3783 (0.0000)***	-0.1779 0.4805	0.7017 (0.0069)***	1.0296 (0.0008)***
3	-2.1594 (0.0000)***	-1.1436 (0.0000)***	-0.2913 0.2961	0.6113 (0.0217)**	0.9538 (0.0018)***
4	-1.3521 (0.0000)***	-0.6835 (0.0124)**	-0.4152 0.1507	0.0307 0.9143	0.3143 0.3035
S	-0.7022 (0.0166)**	-0.3371 0.2155	-0.2298 0.4017	-0.1883 0.4940	0.0314 0.9118

R^2	G	2	3	4	V
B	57.00%	60.70%	58.91%	65.29%	65.14%
2	60.56%	60.32%	63.96%	64.05%	62.45%
3	55.53%	56.53%	52.55%	61.40%	60.47%
4	53.31%	51.84%	50.96%	53.90%	54.88%
S	64.12%	66.77%	67.23%	68.02%	66.99%

Scenario 1 - Method 3

α	Growth	2	3	4	Value
Big	0.0004 0.7585	-0.0004 0.7556	-0.0003 0.8076	-0.0009 0.4904	-0.0003 0.8346
2	0.0000 0.9814	-0.0009 0.4827	0.0000 0.9854	-0.0002 0.8899	0.0007 0.5686
3	0.0003 0.8158	-0.0002 0.8827	-0.0001 0.9309	-0.0004 0.7842	0.0003 0.8504
4	0.0002 0.9014	-0.0002 0.8911	-0.0004 0.7867	-0.0005 0.7046	0.0004 0.8104
Small	0.0003 0.8296	0.0001 0.9581	0.0001 0.9299	0.0000 0.9691	-0.0001 0.9206

β	G	2	3	4	V
B	1.0641 (0.0000)***	1.0829 (0.0000)***	1.0586 (0.0000)***	1.0997 (0.0000)***	1.0357 (0.0000)***
2	1.0954 (0.0000)***	1.1314 (0.0000)***	1.0922 (0.0000)***	1.0962 (0.0000)***	1.0708 (0.0000)***
3	1.0785 (0.0000)***	1.0918 (0.0000)***	1.0671 (0.0000)***	1.0997 (0.0000)***	1.0273 (0.0000)***
4	1.0362 (0.0000)***	1.0515 (0.0000)***	1.0317 (0.0000)***	1.0331 (0.0000)***	1.0364 (0.0000)***
S	1.0604 (0.0000)***	1.0391 (0.0000)***	1.0299 (0.0000)***	1.0535 (0.0000)***	1.0591 (0.0000)***

s_i	G	2	3	4	V
B	1.8274 (0.0000)***	1.3516 (0.0000)***	1.5890 (0.0000)***	1.8062 (0.0000)***	2.1351 (0.0000)***
2	1.7000 (0.0000)***	1.1975 (0.0000)***	1.3570 (0.0000)***	1.2625 (0.0000)***	1.5543 (0.0000)***
3	1.7278 (0.0000)***	1.3051 (0.0000)***	1.4564 (0.0000)***	1.4944 (0.0000)***	1.8319 (0.0000)***
4	1.7120 (0.0000)***	1.3029 (0.0000)***	1.4493 (0.0000)***	1.4776 (0.0000)***	1.7365 (0.0000)***
S	2.2918 (0.0000)***	2.1857 (0.0000)***	2.2372 (0.0000)***	2.2996 (0.0000)***	2.3327 (0.0000)***

h_i	G	2	3	4	V
B	-2.375 (0.0000)***	-1.2098 (0.0000)***	-0.2747 0.3034	0.6091 (0.0313)**	0.6677 (0.0306)**
2	-1.9746 (0.0000)***	-1.2882 (0.0000)***	-0.178 0.4665	0.5147 (0.0388)**	0.8463 (0.0026)***
3	-2.0273 (0.0000)***	-1.0104 (0.0002)***	-0.4127 0.1660	0.5548 (0.0623)*	0.7442 (0.0188)**
4	-1.4028 (0.0000)***	-0.5598 (0.0361)**	-0.219 0.4429	0.2232 0.4406	0.5936 (0.0573)*
S	-0.8182 (0.0054)***	-0.4646 (0.09)*	-0.5049 (0.0667)*	-0.3358 0.2186	-0.0826 0.7696

R^2	G	2	3	4	V
B	61.59%	58.47%	58.67%	64.82%	66.38%
2	65.65%	61.50%	63.44%	61.37%	60.84%
3	55.56%	53.96%	51.13%	56.18%	58.89%
4	57.03%	54.85%	54.01%	55.47%	57.02%
S	63.90%	65.99%	66.07%	68.49%	68.46%

Scenario 1 - Method 4

α	G	2	3	4	V
B	0.0002 0.8821	-0.0006 0.6267	0.0005 0.7090	-0.0011 0.4395	-0.0001 0.9250
2	0.0004 0.7775	-0.0004 0.7517	-0.0001 0.9658	-0.0004 0.7680	0.0009 0.4917
3	0.0003 0.8699	-0.0004 0.7601	0.0005 0.6920	-0.0006 0.6726	0.0003 0.8468
4	0.0001 0.9362	-0.0004 0.7660	0.0002 0.8985	-0.0005 0.7265	0.0004 0.7620
S	0.0002 0.8971	0.0001 0.9090	0.0002 0.8963	0.0000 0.9796	-0.0002 0.8846

β	G	2	3	4	V
B	0.9447 (0.0000)***	1.0717 (0.0000)***	1.0014 (0.0000)***	1.0727 (0.0000)***	1.0179 (0.0000)***
2	1.0672 (0.0000)***	1.0994 (0.0000)***	1.0760 (0.0000)***	1.0660 (0.0000)***	1.0840 (0.0000)***
3	1.0045 (0.0000)***	1.0984 (0.0000)***	1.0228 (0.0000)***	1.0737 (0.0000)***	1.0151 (0.0000)***
4	1.0272 (0.0000)***	1.0350 (0.0000)***	1.0050 (0.0000)***	1.0400 (0.0000)***	1.0607 (0.0000)***
S	1.0586 (0.0000)***	1.0459 (0.0000)***	1.0296 (0.0000)***	1.0502 (0.0000)***	1.0565 (0.0000)***

s_i	G	2	3	4	V
B	1.8563 (0.0000)***	1.3095 (0.0000)***	1.3500 (0.0000)***	1.8422 (0.0000)***	2.0749 (0.0000)***
2	1.3895 (0.0000)***	1.1637 (0.0000)***	1.1409 (0.0000)***	1.3865 (0.0000)***	1.5595 (0.0000)***
3	1.7552 (0.0000)***	1.2937 (0.0000)***	1.3292 (0.0000)***	1.6125 (0.0000)***	1.8139 (0.0000)***
4	1.6918 (0.0000)***	1.2868 (0.0000)***	1.3298 (0.0000)***	1.5428 (0.0000)***	1.7887 (0.0000)***
S	2.3844 (0.0000)***	2.2354 (0.0000)***	2.1826 (0.0000)***	2.2432 (0.0000)***	2.3191 (0.0000)***

h_i	G	2	3	4	V
B	-2.9796 (0.0000)***	-1.9507 (0.0000)***	-0.5769 (0.0331)**	0.1723 0.5560	0.8505 (0.0052)***
2	-1.9477 (0.0000)***	-1.5663 (0.0000)***	-0.8608 (0.0038)***	0.1888 0.4771	1.0800 (0.0000)***
3	-2.1468 (0.0000)***	-1.7534 (0.0000)***	-0.4359 0.1339	0.16 0.5991	0.8749 (0.0052)***
4	-1.4647 (0.0000)***	-1.2427 (0.0000)***	-0.3331 0.2365	0.3533 0.2262	0.9208 (0.0022)***
S	-0.7937 (0.0065)***	-0.5500 (0.0526)*	-0.4985 (0.0675)*	-0.3216 0.2361	-0.0504 0.8594

R^2	G	2	3	4	V
B	46.74%	58.86%	52.23%	61.23%	67.27%
2	54.41%	59.90%	54.05%	57.82%	63.02%
3	45.31%	53.83%	49.73%	54.70%	60.52%
4	50.36%	52.20%	51.62%	55.92%	62.48%
S	65.52%	64.84%	66.26%	67.98%	67.88%

Scenario 1 - Method 5

α	Growth	2	3	4	Value
Large	-0.0021 0.1358	-0.0011 0.3179	-0.0006 0.5591	-0.0015 0.1211	-0.0019 0.1126
2	-0.0012 0.2892	-0.0005 0.6532	-0.0002 0.8649	-0.0007 0.5400	-0.0006 0.5763
3	-0.0017 0.1603	-0.0009 0.4385	-0.0005 0.6709	-0.0013 0.2267	-0.0015 0.2224
4	-0.0019 0.1031	-0.0011 0.3132	-0.0009 0.3739	-0.0015 0.1397	-0.0017 0.1347
Small	-0.0004 0.7854	-0.0006 0.5844	0.0002 0.8858	-0.0010 0.4736	-0.0010 0.4697

β	Growth	2	3	4	Value
Large	1.0725 (0.0000)***	1.1316 (0.0000)***	1.0910 (0.0000)***	1.0916 (0.0000)***	1.1163 (0.0000)***
2	1.1521 (0.0000)***	1.1704 (0.0000)***	1.1383 (0.0000)***	1.1466 (0.0000)***	1.1568 (0.0000)***
3	1.1661 (0.0000)***	1.1713 (0.0000)***	1.1282 (0.0000)***	1.1313 (0.0000)***	1.1235 (0.0000)***
4	1.1655 (0.0000)***	1.1518 (0.0000)***	1.1510 (0.0000)***	1.1560 (0.0000)***	1.1658 (0.0000)***
Small	1.1480 (0.0000)***	1.1050 (0.0000)***	1.0675 (0.0000)***	1.0559 (0.0000)***	1.1171 (0.0000)***

s_i	Growth	2	3	4	Value
Large	2.0383 (0.0000)***	1.2574 (0.0000)***	1.1402 (0.0000)***	1.1231 (0.0000)***	1.5181 (0.0000)***
2	1.0925 (0.0000)***	0.9374 (0.0000)***	0.9698 (0.0000)***	1.1487 (0.0000)***	1.1121 (0.0000)***
3	1.7652 (0.0000)***	1.5629 (0.0000)***	1.5473 (0.0000)***	1.4697 (0.0000)***	1.6180 (0.0000)***
4	2.1738 (0.0000)***	2.0007 (0.0000)***	1.9669 (0.0000)***	1.9565 (0.0000)***	1.9936 (0.0000)***
Small	2.8883 (0.0000)***	1.8220 (0.0000)***	1.9329 (0.0000)***	2.4636 (0.0000)***	2.2386 (0.0000)***

h_i	Growth	2	3	4	Value
Large	-3.5620 (0.0000)***	-2.2577 (0.0000)***	-1.3241 (0.0000)***	-1.0743 (0.0000)***	0.1756 0.3044
2	-2.3342 (0.0000)***	-1.7627 (0.0000)***	-1.1875 (0.0000)***	-1.0503 (0.0000)***	-0.4244 (0.0202)**
3	-2.8297 (0.0000)***	-1.8205 (0.0000)***	-1.1374 (0.0000)***	-1.1723 (0.0000)***	-0.3293 0.1020
4	-2.2925 (0.0000)***	-1.6738 (0.0000)***	-1.3927 (0.0000)***	-1.3685 (0.0000)***	-0.9166 (0.0000)***
Small	-3.0301 (0.0000)***	-2.3569 (0.0000)***	-1.3386 (0.0000)***	-1.4189 (0.0000)***	0.2071 0.3866

R^2	Growth	2	3	4	Value
Large	85.01%	71.50%	70.31%	69.45%	58.86%
2	69.57%	68.72%	64.31%	62.75%	61.03%
3	70.40%	66.41%	65.07%	63.72%	57.81%
4	71.38%	69.23%	70.09%	70.52%	66.23%
Small	80.52%	72.52%	64.99%	63.75%	54.45%

Scenario 2 - Method 1

α	Growth	2	3	4	Value
Big	-0.0007 0.4231	-0.0011 0.2110	-0.0023 (0.0112)**	-0.0032 (0.0006)***	0.0000 0.9813
2	-0.0017 0.1290	-0.0017 0.1058	-0.0032 (0.0018)***	-0.0041 (0.0002)***	-0.0006 0.6014
3	-0.0019 (0.0828)*	-0.0018 0.1153	-0.0030 (0.0100)**	-0.0032 (0.0083)***	-0.0006 0.6039
4	-0.0028 (0.0149)**	-0.0029 (0.0037)***	-0.0043 (0.0000)***	-0.0052 (0.0000)***	-0.0014 0.1865
Small	0.0008 0.4807	0.0006 0.4766	-0.0001 0.9158	-0.0009 0.3645	-0.0004 0.6957

β	Growth	2	3	4	Value
Big	1.0250 (0.0000)***	1.0876 (0.0000)***	1.0840 (0.0000)***	1.0588 (0.0000)***	1.0392 (0.0000)***
2	0.9903 (0.0000)***	1.0604 (0.0000)***	1.0626 (0.0000)***	1.0413 (0.0000)***	1.0099 (0.0000)***
3	0.9721 (0.0000)***	0.9730 (0.0000)***	0.9831 (0.0000)***	0.9585 (0.0000)***	0.9585 (0.0000)***
4	1.0035 (0.0000)***	1.0652 (0.0000)***	1.0512 (0.0000)***	1.0275 (0.0000)***	1.0272 (0.0000)***
Small	0.9782 (0.0000)***	1.0447 (0.0000)***	1.0438 (0.0000)***	1.0207 (0.0000)***	0.9842 (0.0000)***

s_i	Growth	2	3	4	Value
Big	1.6321 (0.0000)***	1.3084 (0.0000)***	1.3860 (0.0000)***	1.3652 (0.0000)***	1.3546 (0.0000)***
2	2.0427 (0.0000)***	1.7315 (0.0000)***	1.9071 (0.0000)***	1.8941 (0.0000)***	1.8822 (0.0000)***
3	2.3858 (0.0000)***	1.9675 (0.0000)***	2.1571 (0.0000)***	2.0650 (0.0000)***	2.3136 (0.0000)***
4	2.7589 (0.0000)***	2.3329 (0.0000)***	2.4198 (0.0000)***	2.4541 (0.0000)***	2.5889 (0.0000)***
Small	3.2284 (0.0000)***	2.6773 (0.0000)***	2.7164 (0.0000)***	2.8102 (0.0000)***	2.8750 (0.0000)***

h_i	Growth	2	3	4	Value
Big	-2.2094 (0.0000)***	-0.9749 (0.0000)***	-0.5720 (0.0018)***	-0.2037 0.2758	0.1933 0.2853
2	-2.2209 (0.0000)***	-1.3523 (0.0000)***	-1.1411 (0.0000)***	-0.6959 (0.0019)***	-0.3864 (0.0800)*
3	-2.5327 (0.0000)***	-1.4489 (0.0000)***	-1.3656 (0.0000)***	-0.8311 (0.0010)***	-0.7013 (0.0061)***
4	-2.5579 (0.0000)***	-1.3939 (0.0000)***	-0.8361 (0.0001)***	-0.4604 (0.0404)**	-0.3124 0.1519
Small	-3.0182 (0.0000)***	-1.4670 (0.0000)***	-0.9180 (0.0000)***	-0.4502 (0.0295)**	0.1880 0.3660

R^2	Growth	2	3	4	Value
Big	72.12%	68.91%	70.57%	68.58%	67.82%
2	62.80%	63.71%	66.87%	63.14%	59.80%
3	63.24%	57.24%	60.56%	53.88%	54.88%
4	64.59%	67.01%	69.44%	68.31%	68.62%
Small	68.02%	72.47%	74.29%	73.01%	75.44%

Scenario 2 - Method 2

α	Growth	2	3	4	Value
Big	-0.0001 0.9494	-0.0016 (0.0829)*	-0.0021 (0.0198)**	-0.0038 (0.0000)***	-0.0009 0.3632
2	-0.0002 0.8787	-0.0015 0.1012	-0.0019 (0.0365)**	-0.0031 (0.0004)***	-0.0008 0.3752
3	-0.0005 0.6883	-0.0016 0.1172	-0.0020 (0.0469)**	-0.0033 (0.0007)***	-0.0009 0.3361
4	-0.0017 0.2098	-0.0019 (0.0941)*	-0.0020 (0.0523)*	-0.0028 (0.0073)***	-0.0013 0.1961
Small	-0.0015 0.1631	-0.0020 (0.0404)**	-0.0018 (0.0812)*	-0.0019 (0.0647)*	-0.0025 (0.0386)**

β	Growth	2	3	4	Value
Big	0.9454 (0.0000)***	1.0737 (0.0000)***	1.0894 (0.0000)***	1.0193 (0.0000)***	0.9930 (0.0000)***
2	0.9673 (0.0000)***	1.0728 (0.0000)***	1.0879 (0.0000)***	1.0014 (0.0000)***	0.9967 (0.0000)***
3	0.9820 (0.0000)***	1.0890 (0.0000)***	1.1277 (0.0000)***	1.0503 (0.0000)***	1.0212 (0.0000)***
4	1.0125 (0.0000)***	1.0691 (0.0000)***	1.0848 (0.0000)***	1.0633 (0.0000)***	1.0285 (0.0000)***
Small	1.0025 (0.0000)***	1.0174 (0.0000)***	0.9923 (0.0000)***	0.9630 (0.0000)***	1.0041 (0.0000)***

s_i	Growth	2	3	4	Value
Big	2.3249 (0.0000)***	1.7489 (0.0000)***	1.6963 (0.0000)***	1.6244 (0.0000)***	1.9039 (0.0000)***
2	2.2046 (0.0000)***	1.6258 (0.0000)***	1.5989 (0.0000)***	1.4095 (0.0000)***	1.8521 (0.0000)***
3	2.1269 (0.0000)***	1.5676 (0.0000)***	1.5943 (0.0000)***	1.5016 (0.0000)***	1.8606 (0.0000)***
4	2.2935 (0.0000)***	1.8539 (0.0000)***	1.9027 (0.0000)***	1.8622 (0.0000)***	2.0172 (0.0000)***
Small	2.6435 (0.0000)***	2.4636 (0.0000)***	2.2453 (0.0000)***	2.2465 (0.0000)***	2.5981 (0.0000)***

h_i	Growth	2	3	4	Value
Big	-3.4821 (0.0000)***	-2.0804 (0.0000)***	-1.1193 (0.0000)***	-0.4430 (0.0132)**	0.4033 (0.0406)**
2	-3.2534 (0.0000)***	-1.8700 (0.0000)***	-0.9997 (0.0000)***	-0.4336 (0.0011)***	0.4104 (0.0376)**
3	-2.8471 (0.0000)***	-1.4275 (0.0000)***	-0.7885 (0.0002)***	-0.2678 0.1787	0.2961 0.1479
4	-1.7710 (0.0000)***	-0.9487 (0.0000)***	-0.8241 (0.0002)***	-0.7627 (0.0004)***	-0.5795 (0.0044)***
Small	-3.1246 (0.0000)***	-2.5913 (0.0000)***	-1.4611 (0.0000)***	-0.7566 (0.0004)***	-0.4053 0.1005

R^2	Growth	2	3	4	Value
Big	67.57%	73.32%	71.49%	70.78%	69.48%
2	68.17%	72.85%	71.36%	70.15%	68.99%
3	62.92%	66.44%	66.64%	66.31%	67.29%
4	55.84%	59.69%	63.43%	63.21%	65.26%
Small	70.38%	71.12%	64.31%	63.43%	65.33%

Scenario 2 - Method 3

α	Growth	2	3	4	Value
Big	-0.0001 0.9209	-0.0017 (0.0607)*	-0.0022 (0.0129)**	-0.0038 (0.0000)***	-0.0010 0.3067
2	-0.0003 0.7416	-0.0014 0.1162	-0.0017 (0.0635)*	-0.0029 (0.0013)***	-0.0008 0.3843
3	-0.0004 0.7572	-0.0016 0.1176	-0.0023 (0.0240)**	-0.0034 (0.0007)***	-0.0009 0.3576
4	-0.0013 0.2631	-0.0022 (0.0325)**	-0.0024 (0.0200)**	-0.0039 (0.0001)***	-0.0014 0.1844
Small	-0.0016 0.1204	-0.0016 0.1242	-0.0016 0.1273	-0.0018 (0.0880)*	-0.0019 (0.0746)*

β	Growth	2	3	4	Value
Big	0.9467 (0.0000)***	1.0729 (0.0000)***	1.0873 (0.0000)***	1.0177 (0.0000)***	0.9906 (0.0000)***
2	1.0034 (0.0000)***	1.0880 (0.0000)***	1.1023 (0.0000)***	1.0472 (0.0000)***	1.0156 (0.0000)***
3	0.9876 (0.0000)***	1.0851 (0.0000)***	1.1199 (0.0000)***	1.0555 (0.0000)***	1.0156 (0.0000)***
4	0.9738 (0.0000)***	1.0684 (0.0000)***	1.0684 (0.0000)***	1.0439 (0.0000)***	1.0082 (0.0000)***
Small	0.9984 (0.0000)***	0.9940 (0.0000)***	0.9909 (0.0000)***	0.9918 (0.0000)***	0.9981 (0.0000)***

s_i	Growth	2	3	4	Value
Big	2.3126 (0.0000)***	1.7427 (0.0000)***	1.6700 (0.0000)***	1.6030 (0.0000)***	1.8873 (0.0000)***
2	1.9399 (0.0000)***	1.4400 (0.0000)***	1.3989 (0.0000)***	1.3473 (0.0000)***	1.7091 (0.0000)***
3	2.1543 (0.0000)***	1.6779 (0.0000)***	1.7305 (0.0000)***	1.6225 (0.0000)***	1.9260 (0.0000)***
4	2.0820 (0.0000)***	1.8254 (0.0000)***	1.7413 (0.0000)***	1.8361 (0.0000)***	1.9963 (0.0000)***
Small	2.6720 (0.0000)***	2.6312 (0.0000)***	2.6555 (0.0000)***	2.6582 (0.0000)***	2.6204 (0.0000)***

h_i	Growth	2	3	4	Value
Big	-3.4841 (0.0000)***	-2.0886 (0.0000)***	-1.0768 (0.0000)***	-0.3953 (0.0263)**	0.4265 (0.0303)**
2	-2.6408 (0.0000)***	-1.4426 (0.0000)***	-0.7226 (0.0001)***	-0.2831 0.1179	0.3698 (0.0581)*
3	-3.0336 (0.0000)***	-1.8005 (0.0000)***	-1.0535 (0.0000)***	-0.4762 (0.0214)**	0.2530 0.2364
4	-2.3417 (0.0000)***	-1.8630 (0.0000)***	-1.3025 (0.0000)***	-0.9891 (0.0000)***	-0.1755 0.4125
Small	-1.5649 (0.0000)***	-1.2825 (0.0000)***	-1.2378 (0.0000)***	-1.1847 (0.0000)***	-1.0002 (0.0000)***

R^2	Growth	2	3	4	Value
Big	67.97%	73.93%	71.72%	70.78%	69.48%
2	68.56%	71.32%	70.09%	69.40%	68.20%
3	65.02%	67.29%	67.16%	65.42%	65.69%
4	61.78%	66.63%	64.58%	66.32%	63.53%
Small	65.49%	66.52%	66.04%	66.47%	65.63%

Scenario 2 - Method 4

α	Growth	2	3	4	Value
Big	-0.0007 0.5241	-0.0011 0.2343	-0.0028 (0.0021)***	-0.0046 (0.0000)***	0.0005 0.6342
2	-0.0007 0.4559	-0.0010 0.2947	-0.0024 (0.0102)**	-0.0036 (0.0003)***	0.0004 0.6859
3	-0.0008 0.4926	-0.0012 0.2476	-0.0028 (0.0053)***	-0.0042 (0.0001)***	0.0003 0.7578
4	-0.0017 0.1324	-0.0017 (0.0946)*	-0.0032 (0.0013)***	-0.0045 (0.0000)***	-0.0005 0.6238
Small	-0.0017 0.1053	-0.0016 0.1238	-0.0016 0.1222	-0.0018 (0.0885)*	-0.0018 (0.0903)*

β	Growth	2	3	4	Value
Big	0.9621 (0.0000)***	1.0759 (0.0000)***	1.0614 (0.0000)***	1.0195 (0.0000)***	0.9859 (0.0000)***
2	1.0154 (0.0000)***	1.0853 (0.0000)***	1.0737 (0.0000)***	1.0437 (0.0000)***	1.0251 (0.0000)***
3	1.0023 (0.0000)***	1.0926 (0.0000)***	1.0826 (0.0000)***	1.0526 (0.0000)***	1.0186 (0.0000)***
4	0.9809 (0.0000)***	1.0716 (0.0000)***	1.0693 (0.0000)***	1.0426 (0.0000)***	1.0011 (0.0000)***
Small	0.9990 (0.0000)***	0.9929 (0.0000)***	0.9944 (0.0000)***	0.9922 (0.0000)***	0.9950 (0.0000)***

s_i	Growth	2	3	4	Value
Big	2.3996 (0.0000)***	1.6827 (0.0000)***	1.7422 (0.0000)***	1.7370 (0.0000)***	1.8490 (0.0000)***
2	2.0039 (0.0000)***	1.4264 (0.0000)***	1.5270 (0.0000)***	1.5086 (0.0000)***	1.5676 (0.0000)***
3	2.2416 (0.0000)***	1.6646 (0.0000)***	1.7818 (0.0000)***	1.7602 (0.0000)***	1.8395 (0.0000)***
4	2.1642 (0.0000)***	1.7547 (0.0000)***	1.9041 (0.0000)***	1.9258 (0.0000)***	1.9374 (0.0000)***
Small	2.7111 (0.0000)***	2.5721 (0.0000)***	2.5810 (0.0000)***	2.6407 (0.0000)***	2.7353 (0.0000)***

h_i	Growth	2	3	4	Value
Big	-3.7443 (0.0000)***	-1.5199 (0.0000)***	-0.6801 (0.0003)***	0.0680 0.7380	0.6585 (0.0009)***
2	-2.9009 (0.0000)***	-1.0778 (0.0000)***	-0.5504 (0.0037)***	0.0433 0.8283	0.5110 (0.0086)***
3	-3.3052 (0.0000)***	-1.4051 (0.0000)***	-0.6969 (0.0009)***	-0.1059 0.6338	0.4085 (0.0678)*
4	-2.6184 (0.0000)***	-1.5195 (0.0000)***	-1.1342 (0.0000)***	-0.6294 (0.0050)***	-0.2386 0.2770
Small	-1.6110 (0.0000)***	-1.2495 (0.0000)***	-1.1694 (0.0000)***	-1.0943 (0.0000)***	-1.1261 (0.0000)***

R^2	Growth	2	3	4	Value
Big	73.29%	69.67%	70.46%	67.48%	69.80%
2	72.45%	68.10%	69.45%	66.78%	67.88%
3	69.56%	64.84%	66.91%	63.86%	63.25%
4	64.70%	65.85%	67.94%	63.51%	60.70%
Small	65.94%	66.50%	66.08%	65.53%	65.93%

Scenario 2 - Method 5

α	Growth	2	3	4	Value
Large	-0.0003 0.7002	0.0007 0.3256	0.0007 0.3334	-0.0004 0.6261	0.0001 0.9416
2	0.0000 0.9522	0.0009 0.2664	0.0009 0.2837	0.0002 0.8150	0.0005 0.5329
3	-0.0003 0.7598	0.0004 0.6061	0.0005 0.5098	-0.0003 0.7417	-0.0001 0.9081
4	-0.0001 0.9109	0.0003 0.6360	0.0003 0.6998	0.0000 0.9620	0.0000 0.9967
Small	-0.0001 0.9492	0.0009 0.2105	0.0013 0.1084	0.0008 0.3485	0.0012 0.2566

β	Growth	2	3	4	Value
Large	1.0037 (0.0000)***	1.1154 (0.0000)***	1.0414 (0.0000)***	1.0732 (0.0000)***	1.0263 (0.0000)***
2	1.0862 (0.0000)***	1.1041 (0.0000)***	1.0750 (0.0000)***	1.0874 (0.0000)***	1.0543 (0.0000)***
3	1.1098 (0.0000)***	1.1511 (0.0000)***	1.0941 (0.0000)***	1.1161 (0.0000)***	1.1000 (0.0000)***
4	1.0376 (0.0000)***	1.1025 (0.0000)***	1.0736 (0.0000)***	1.1011 (0.0000)***	1.0817 (0.0000)***
Small	1.0073 (0.0000)***	1.0992 (0.0000)***	1.0181 (0.0000)***	1.0625 (0.0000)***	1.0650 (0.0000)***

s_i	Growth	2	3	4	Value
Large	0.8911 (0.0000)***	1.0208 (0.0000)***	0.7451 (0.0000)***	0.7879 (0.0000)***	0.7629 (0.0000)***
2	0.6397 (0.0000)***	0.6359 (0.0000)***	0.4853 (0.0007)***	0.6329 (0.0000)***	0.5172 (0.0002)***
3	1.3598 (0.0000)***	1.5003 (0.0000)***	1.2951 (0.0000)***	1.2135 (0.0000)***	1.3934 (0.0000)***
4	1.5865 (0.0000)***	1.7746 (0.0000)***	1.6492 (0.0000)***	1.7832 (0.0000)***	1.6843 (0.0000)***
Small	1.4591 (0.0000)***	1.5820 (0.0000)***	1.1776 (0.0000)***	1.3215 (0.0000)***	1.4395 (0.0000)***

h_i	Growth	2	3	4	Value
Large	-1.9584 (0.0000)***	-0.5038 (0.0004)***	0.3036 (0.0309)**	0.2466 0.1043	1.6171 (0.0000)***
2	-0.8642 (0.0000)***	-0.0129 0.9371	0.5399 (0.0014)***	0.3145 (0.0574)*	1.0586 (0.0000)***
3	-1.1535 (0.0000)***	-0.3176 (0.0638)*	0.1962 0.2254	0.2478 0.1585	1.0488 (0.0000)***
4	-0.5280 (0.0024)***	-0.0243 0.8718	0.1403 0.3459	0.2718 (0.0816)*	0.5566 (0.0002)***
Small	-2.4091 (0.0000)***	-0.4558 (0.0037)***	0.5510 (0.0010)***	0.6025 (0.0012)***	2.5868 (0.0000)***

R^2	Growth	2	3	4	Value
Large	80.50%	81.50%	75.30%	74.46%	69.11%
2	76.06%	72.70%	67.69%	70.84%	66.30%
3	76.66%	77.52%	74.31%	71.76%	67.28%
4	75.60%	80.30%	78.70%	78.49%	80.85%
Small	82.16%	80.11%	68.16%	66.78%	57.11%

Scenario 3 - Method 1

α	Growth	2	3	4	Value
Big	0.0019 (0.0816)*	0.0014 0.1894	0.0017 0.1071	0.0013 0.2167	0.0014 0.1831
2	0.0019 (0.0999)*	0.0021 (0.0543)*	0.0024 (0.034)**	0.002 (0.0764)*	0.0023 (0.0549)*
3	0.0021 (0.084)*	0.0021 (0.0726)*	0.0023 (0.0479)**	0.002 (0.0863)*	0.0022 (0.0739)*
4	0.0016 0.1639	0.0017 0.1141	0.0019 (0.0914)*	0.0016 0.1600	0.0017 0.1497
Small	0.0024 (0.0413)**	0.0022 (0.0464)**	0.0023 (0.0427)**	0.0018 0.1029	0.0019 0.1118

β	G	2	3	4	V
B	1.078 (0.0000)***	1.0422 (0.0000)***	1.0281 (0.0000)***	1.0303 (0.0000)***	1.0262 (0.0000)***
2	1.0132 (0.0000)***	1.023 (0.0000)***	0.9961 (0.0000)***	1.003 (0.0000)***	1.0046 (0.0000)***
3	0.9946 (0.0000)***	1.0046 (0.0000)***	0.9787 (0.0000)***	0.9718 (0.0000)***	0.9827 (0.0000)***
4	0.9792 (0.0000)***	1.0137 (0.0000)***	0.9851 (0.0000)***	0.9926 (0.0000)***	0.9971 (0.0000)***
S	0.9781 (0.0000)***	1.0577 (0.0000)***	1.0531 (0.0000)***	1.0548 (0.0000)***	1.0609 (0.0000)***

si	G	2	3	4	V
B	0.6386 (0.0004)***	-0.2061 0.2405	-0.0425 0.8106	0.0261 0.8797	-0.0164 0.9261
2	0.7341 (0.0002)***	0.0114 0.9495	0.1135 0.5405	0.2155 0.2384	0.1832 0.3397
3	0.9751 (0.0000)***	0.249 0.1836	0.349 (0.0713)*	0.4249 (0.0283)**	0.4536 (0.0225)**
4	1.2001 (0.0000)***	0.5717 (0.0016)***	0.6395 (0.0006)***	0.724 (0.0001)***	0.8343 (0.0000)***
S	1.6156 (0.0000)***	1.3915 (0.0000)***	1.5808 (0.0000)***	1.7267 (0.0000)***	1.8801 (0.0000)***

hi	G	2	3	4	V
B	-1.1894 (0.0000)***	-0.3581 0.1026	0.1373 0.5377	0.3049 0.1584	0.6847 (0.0021)***
2	-1.2852 (0.0000)***	0.2237 0.3172	0.5753 (0.0134)**	0.8419 (0.0003)***	1.1122 (0.0000)***
3	-1.0836 (0.0000)***	0.2909 0.2118	0.7759 (0.0014)***	1.0803 (0.0000)***	1.3531 (0.0000)***
4	-1.2134 (0.0000)***	0.1146 0.6085	0.68 (0.0033)***	0.9923 (0.0000)***	1.2911 (0.0000)***
S	-1.5991 (0.0000)***	-0.795 (0.0007)***	-0.1642 0.4855	0.0488 0.8358	0.4166 (0.0904)*

R2	G	2	3	4	V
B	60.02%	63.21%	54.93%	53.62%	50.55%
2	52.31%	51.72%	45.50%	45.28%	43.95%
3	44.25%	44.88%	41.20%	42.52%	44.58%
4	44.67%	45.39%	440%	47.96%	50.73%
S	44.35%	46.23%	48.33%	51.72%	55.58%

Scenario 3 - Method 2

α	Growth	2	3	4	Value
Big	0.0019 0.1026	0.0015 0.1426	0.0018 (0.0803)*	0.0019 (0.0682)*	0.0016 0.1452
2	0.0019 0.1026	0.0016 0.1298	0.0018 (0.0826)*	0.0021 (0.0466)**	0.0016 0.1307
3	0.0021 (0.0979)*	0.0019 (0.0938)*	0.0021 (0.0514)*	0.0022 (0.0417)**	0.0018 0.1045
4	0.0018 0.1335	0.0011 0.3394	0.0015 0.1880	0.0017 0.1467	0.0016 0.1704
Small	0.0019 (0.0868)*	0.002 (0.0673)*	0.002 (0.0744)*	0.002 (0.0727)*	0.0019 (0.0846)*

β	G	2	3	4	V
B	1.0267 (0.0000)***	1.0353 (0.0000)***	1.0006 (0.0000)***	1.0129 (0.0000)***	1.0084 (0.0000)***
2	1.0194 (0.0000)***	1.0416 (0.0000)***	1.0032 (0.0000)***	1.02 (0.0000)***	1.0063 (0.0000)***
3	1.0426 (0.0000)***	1.063 (0.0000)***	1.0229 (0.0000)***	1.0527 (0.0000)***	1.0275 (0.0000)***
4	1.0643 (0.0000)***	1.0269 (0.0000)***	1.0121 (0.0000)***	1.022 (0.0000)***	1.0176 (0.0000)***
S	0.9821 (0.0000)***	0.9917 (0.0000)***	0.9893 (0.0000)***	0.9883 (0.0000)***	0.9935 (0.0000)***

si	G	2	3	4	V
B	1.4857 (0.0000)***	-0.0449 0.7936	0.1203 0.4839	0.3532 (0.0476)**	0.5377 (0.0022)***
2	1.492 (0.0000)***	-0.0611 0.7226	0.15 0.3968	0.3607 (0.0464)**	0.5397 (0.0024)***
3	1.4482 (0.0000)***	-0.1208 0.5086	0.0742 0.6876	0.2982 0.1072	0.5145 (0.0045)***
4	1.2947 (0.0000)***	-0.2388 0.2237	-0.0912 0.6391	0.1168 0.5409	0.4031 (0.0316)**
S	0.7336 (0.0001)***	0.7653 (0.0000)***	0.7653 (0.0000)***	0.7606 (0.0000)***	0.7643 (0.0000)***

hi	G	2	3	4	V
B	-2.9601 (0.0000)***	-0.4912 (0.0225)**	0.126 0.5588	0.7098 (0.0017)***	1.5929 (0.0000)***
2	-2.9612 (0.0000)***	-0.4299 (0.0463)**	0.1224 0.5819	0.8225 (0.0004)***	1.6458 (0.0000)***
3	-2.8021 (0.0000)***	-0.1845 0.4185	0.317 0.1717	1.007 (0.0000)***	1.6466 (0.0000)***
4	-2.404 (0.0000)***	-0.8054 (0.0011)***	-0.1848 0.4476	0.3668 0.1263	1.3299 (0.0000)***
S	0.0082 0.9711	0.1794 0.4279	0.1811 0.4220	0.1907 0.3993	0.2614 0.2530

R2	Growth	2	3	4	Value
Big	63.92%	62.65%	52.58%	48.02%	55.27%
2	63.80%	62.40%	51.03%	47.96%	55.30%
3	60.09%	58.91%	49.60%	48.71%	54.70%
4	59.85%	62.83%	53.17%	46.81%	48.05%
Small	41.92%	42.74%	42.74%	42.55%	42.43%

Scenario 3 - Method 3

α	Growth	2	3	4	Value
Big	0.0018 0.1184	0.0014 0.1755	0.0017 (0.0936)*	0.0019 (0.067)*	0.0019 (0.0817)*
2	0.0019 (0.097)*	0.0015 0.1432	0.0018 (0.0827)*	0.0019 (0.0668)*	0.0017 0.1126
3	0.002 (0.0976)*	0.0014 0.2903	0.0017 0.1936	0.0019 0.1179	0.0016 0.1794
4	0.0021 (0.0756)*	0.0022 (0.0476)**	0.0023 (0.0371)**	0.0024 (0.0303)**	0.0021 (0.069)*
Small	0.0019 (0.0971)*	0.002 (0.072)*	0.0019 (0.081)*	0.0019 (0.0841)*	0.0018 0.1038

β	G	2	3	4	V
B	1.0344 (0.0000)***	1.0444 (0.0000)***	1.0128 (0.0000)***	1.0231 (0.0000)***	1.0698 (0.0000)***
2	1.0573 (0.0000)***	1.0562 (0.0000)***	1.0301 (0.0000)***	1.054 (0.0000)***	1.0299 (0.0000)***
3	1.0581 (0.0000)***	1.0093 (0.0000)***	0.9943 (0.0000)***	0.9993 (0.0000)***	1.0092 (0.0000)***
4	1.0151 (0.0000)***	1.026 (0.0000)***	0.9908 (0.0000)***	1.0091 (0.0000)***	1.0118 (0.0000)***
S	0.9637 (0.0000)***	0.9905 (0.0000)***	0.9841 (0.0000)***	0.9853 (0.0000)***	0.9903 (0.0000)***

si	G	2	3	4	V
B	1.4731 (0.0000)***	-0.0525 0.7557	0.1243 0.4702	0.3467 (0.0485)**	0.6469 (0.0007)***
2	1.0111 (0.0000)***	-0.2305 0.1811	-0.0773 0.6544	0.1016 0.5540	0.3744 (0.0305)**
3	1.2017 (0.0000)***	-0.2372 0.2636	-0.1068 0.6192	0.0768 0.7073	0.3942 (0.0441)**
4	0.924 (0.0000)***	-0.0501 0.7874	-0.0088 0.9620	0.1639 0.3812	0.3851 (0.0385)**
S	0.975 (0.0000)***	1.0047 (0.0000)***	1.0488 (0.0000)***	1.0401 (0.0000)***	1.0095 (0.0000)***

hi	G	2	3	4	V
B	-2.9325 (0.0000)***	-0.4768 (0.0241)**	0.1283 0.5530	0.7238 (0.0012)***	1.5061 (0.0000)***
2	-1.8619 (0.0000)***	-0.1444 0.5013	0.3036 0.1614	0.748 (0.0006)***	1.4 (0.0000)***
3	-2.5047 (0.0000)***	-1.0741 (0.0001)***	-0.6444 (0.0173)**	0.089 0.7284	1.1119 (0.0000)***
4	-1.6981 (0.0000)***	0.1893 0.4140	0.3458 0.1322	0.6774 (0.0041)***	1.3773 (0.0000)***
S	-0.1716 0.4495	0.1237 0.5787	0.2125 0.3401	0.2398 0.2830	0.4615 (0.042)**

R2	G	2	3	4	V
B	64.43%	63.83%	53.28%	49.42%	54.50%
2	59.59%	62.88%	55.33%	52.76%	530%
3	60.50%	61.53%	52.96%	44.66%	43.74%
4	53.67%	51.49%	48.51%	45.36%	48.49%
S	40.71%	43.75%	44.34%	44.42%	45.37%

Scenario 3 - Method 4

α	Growth	2	3	4	Value
Big	0.0019 0.1025	0.0017 0.1055	0.0022 (0.0428)**	0.0014 0.1853	0.0017 0.1280
2	0.0019 (0.0857)*	0.0018 (0.0935)*	0.002 (0.0607)*	0.0016 0.1315	0.0018 0.1034
3	0.0021 (0.0905)*	0.0016 0.1787	0.0021 (0.0872)*	0.0015 0.2375	0.0017 0.2077
4	0.0022 (0.0717)*	0.0022 (0.0455)**	0.0025 (0.0281)**	0.0021 (0.0656)*	0.0024 (0.0461)**
Small	0.0019 (0.0962)*	0.0019 (0.0711)*	0.0019 (0.0767)*	0.0018 (0.0941)*	0.0018 0.1008

β	G	2	3	4	V
B	1.029 (0.0000)***	1.0536 (0.0000)***	1.0231 (0.0000)***	1.0207 (0.0000)***	1.0226 (0.0000)***
2	1.0535 (0.0000)***	1.0676 (0.0000)***	1.0268 (0.0000)***	1.0434 (0.0000)***	1.046 (0.0000)***
3	1.0589 (0.0000)***	1.029 (0.0000)***	0.9935 (0.0000)***	1.0084 (0.0000)***	1.0076 (0.0000)***
4	1.0138 (0.0000)***	1.0294 (0.0000)***	1.0008 (0.0000)***	1.0131 (0.0000)***	1.0139 (0.0000)***
S	0.9604 (0.0000)***	0.9924 (0.0000)***	0.9899 (0.0000)***	0.9829 (0.0000)***	0.9883 (0.0000)***

si	G	2	3	4	V
B	1.3618 (0.0000)***	0.0789 0.6448	0.3102 (0.0875)*	0.4533 (0.0094)***	0.4609 (0.0117)**
2	0.9621 (0.0000)***	-0.0749 0.6661	0.1132 0.5144	0.2251 0.1941	0.1817 0.3042
3	1.1265 (0.0000)***	-0.0663 0.7407	0.0896 0.6581	0.2203 0.2809	0.218 0.3204
4	0.8993 (0.0000)***	0.0323 0.8594	0.1505 0.4205	0.2416 0.1963	0.2422 0.2162
S	0.9574 (0.0000)***	0.964 (0.0000)***	1.0047 (0.0000)***	1.052 (0.0000)***	1.1069 (0.0000)***

hi	G	2	3	4	V
B	-2.7147 (0.0000)***	-0.3311 0.1219	0.6674 (0.0037)***	1.1081 (0.0000)***	1.7832 (0.0000)***
2	-1.775 (0.0000)***	-0.0627 0.7723	0.6224 (0.0045)***	0.9407 (0.0000)***	1.5122 (0.0000)***
3	-2.3477 (0.0000)***	-0.7837 (0.0019)***	0.1181 0.6418	0.4579 (0.0736)*	0.9094 (0.001)***
4	-1.6072 (0.0000)***	0.1337 0.5565	0.6044 (0.0101)**	0.996 (0.0000)***	1.3805 (0.0000)***
S	-0.1704 0.4533	0.1109 0.6141	0.2737 0.2214	0.3188 0.1554	0.353 0.1205

R2	G	2	3	4	V
B	63.48%	59.91%	47.78%	50.76%	55.22%
2	59.27%	59.64%	50.91%	50.75%	52.47%
3	59.81%	58.73%	44.36%	40.91%	37.16%
4	52.96%	51.84%	45.29%	45.25%	45.26%
S	40.47%	44.28%	44.49%	44.73%	45.14%

Scenario 3 - Method 5

α	Growth	2	3	4	Value
Big	0.0009 0.3174	0.0013 0.1459	0.001 0.2506	0.001 0.2370	0.0007 0.3599
2	0.0014 0.1510	0.0017 (0.0841)*	0.0015 0.1083	0.0012 0.1845	0.0012 0.1883
3	0.0008 0.4408	0.001 0.3427	0.0009 0.4012	0.0009 0.3966	0.0006 0.5871
4	0.0012 0.2091	0.0015 0.1218	0.0013 0.1771	0.0014 0.1603	0.0013 0.1811
Small	0.0004 0.6633	0.0011 0.2441	0.0008 0.3686	0.001 0.2808	0.0008 0.4035

β	G	2	3	4	V
B	0.9194 (0.0000)***	1.0436 (0.0000)***	1.0408 (0.0000)***	0.9466 (0.0000)***	0.9883 (0.0000)***
2	0.9232 (0.0000)***	0.9852 (0.0000)***	0.9603 (0.0000)***	0.9395 (0.0000)***	0.9505 (0.0000)***
3	0.9444 (0.0000)***	1.0329 (0.0000)***	1.0345 (0.0000)***	0.937 (0.0000)***	1.0238 (0.0000)***
4	1.0028 (0.0000)***	1.0527 (0.0000)***	1.0566 (0.0000)***	0.9977 (0.0000)***	1.0142 (0.0000)***
S	0.8526 (0.0000)***	0.951 (0.0000)***	0.9304 (0.0000)***	0.881 (0.0000)***	0.9396 (0.0000)***

si	G	2	3	4	V
B	-0.1053 0.5312	-0.112 0.5071	0.0933 0.5713	-0.2155 0.2032	-0.0007 0.9963
2	-0.5349 (0.0034)***	-0.6081 (0.001)***	-0.419 (0.018)**	-0.5447 (0.0018)***	-0.4683 (0.0054)***
3	-0.1864 0.3378	-0.2576 0.1977	-0.0242 0.9084	-0.402 (0.0406)**	-0.0952 0.6365
4	0.4853 (0.0108)**	0.4801 (0.01)***	0.6262 (0.0006)***	0.4203 (0.0299)**	0.5221 (0.0071)***
S	0.6747 (0.0001)***	0.5815 (0.0009)***	0.6983 (0.0000)***	0.4326 (0.0171)**	0.6291 (0.0004)***

hi	G	2	3	4	V
B	-2.1464 (0.0000)***	-0.6545 (0.0000)***	-0.2742 (0.082)*	0.1458 0.3675	1.5089 (0.0000)***
2	-0.8966 (0.0000)***	-0.124 0.4676	0.0585 0.7223	0.3036 (0.0613)*	0.8495 (0.0000)***
3	-1.8615 (0.0000)***	-1.1085 (0.0000)***	-0.9427 (0.0000)***	-0.6181 (0.0008)***	0.117 0.5323
4	-1.3838 (0.0000)***	-0.6715 (0.0001)***	-0.6675 (0.0001)***	-0.3136 (0.0838)*	0.2337 0.1930
S	-1.8655 (0.0000)***	-0.6453 (0.0001)***	-0.1259 0.4107	-0.0124 0.9418	1.1268 (0.0000)***

R2	G	2	3	4	V
B	76.77%	69.96%	66.43%	61.38%	62.65%
2	67.97%	65.34%	62.94%	63.10%	62.11%
3	70.57%	66.67%	60.81%	61.60%	55.57%
4	64.92%	61.51%	61.60%	54.37%	50.27%
S	67.67%	58.77%	55.12%	48.37%	46.57%

Appendix 5 The bond yield approach extended sample

1. The following tables set out the bonds utilised in the enhanced benchmark sample.

No.	Bond	Country of Domicile	Country of Risk	S&P Credit Rating	Years to maturity	Currency	Spread to Swap with Cross Currency Conversion (7 Day Average in bp)	Amount (A$)	Redemption
1	New Terminal Financing Co Pty Ltd	AU	AU	BBB	2.0	AUD	166.22	100,000,000	AT MATURITY
2	AusNet Electricity Services Pty Ltd	AU	AU	BBB+ /*+	2.2	USD	161.89	100,000,000	AT MATURITY
3	Coca-Cola Amatil Ltd	AU	AU	BBB+	2.4	AUD	58.78	250,000,000	AT MATURITY
4	SGSP Australia Assets Pty Ltd	AU	AU	BBB+	2.5	AUD	100.73	400,000,000	AT MATURITY
5	United Energy Distribution Pty Ltd	AU	AU	BBB	2.6	AUD	136.97	265,000,000	AT MATURITY
6	DBNGP Finance Co Pty Ltd	AU	AU	BBB-	2.6	AUD	180.52	275,000,000	CALLABLE
7	Powercor Australia LLC	AU	AU	BBB+	2.6	AUD	105.35	200,000,000	AT MATURITY
8	CitiPower I Pty Ltd	AU	AU	BBB+	2.9	AUD	99.02	300,000,000	CALLABLE
9	CitiPower I Pty Ltd	AU	AU	BBB+	2.9	AUD	101.21	275,000,000	CALLABLE
10	Crown Group Finance Ltd	AU	AU	BBB	2.9	AUD	114.32	300,000,000	AT MATURITY
11	Leighton Finance USA Pty Ltd	AU	AU	BBB-	2.9	USD	246.58	145,000,000	AT MATURITY
12	Holcim Finance Australia Pty Ltd	AU	CH	BBB	2.9	AUD	116.28	250,000,000	AT MATURITY
13	Premier Finance Trust Australia	AU	AU	BBB-	3.0	AUD	157.32	190,000,000	AT MATURITY
14	Coca-Cola Amatil Ltd	AU	AU	BBB+	3.4	AUD	21.42	100,000,000	AT MATURITY
15	Asciano Finance Ltd	AU	AU	BBB-	3.6	USD	136.82	750,000,000	AT MATURITY
16	Asciano Finance Ltd	AU	AU	BBB-	3.6	USD	136.70	750,000,000	AT MATURITY
17	Jemena Ltd	AU	AU	BBB+	3.6	USD	140.65	150,000,000	AT MATURITY
18	Jemena Ltd	AU	AU	BBB+	3.6	USD	172.28	150,000,000	AT MATURITY
19	Brambles Finance PLC	GB	AU	BBB+	3.6	EUR	107.88	500,000,000	AT MATURITY
20	DBNGP Finance Co Pty Ltd	AU	AU	BBB-	3.6	AUD	216.42	325,000,000	CALLABLE
21	Sydney Airport Finance Co Pty Ltd	AU	AU	BBB	3.8	AUD	114.48	100,000,000	AT MATURITY
22	Coca-Cola Amatil Ltd	AU	AU	BBB+	4.0	AUD	43.99	200,000,000	AT MATURITY
23	Origin Energy Finance Ltd	AU	AU	BBB	4.1	USD	135.36	800,000,000	AT MATURITY
24	Origin Energy Finance Ltd	AU	AU	BBB	4.1	USD	136.98	800,000,000	AT MATURITY
25	Leighton Finance Ltd	AU	AU	BBB-	4.1	USD	288.75	79,000,000	AT MATURITY
26	Adani Abbot Point Terminal Pty Ltd	AU	AU	BBB-	4.1	AUD	246.26	500,000,000	AT MATURITY
27	Caltex Australia Ltd	AU	AU	BBB+	4.2	AUD	108.86	150,000,000	AT MATURITY
28	Incitec Pivot Ltd	AU	AU	BBB	4.5	AUD	162.07	200,000,000	AT MATURITY
29	Woodside Finance Ltd	AU	AU	BBB+	4.5	USD	121.96	600,000,000	AT MATURITY
30	Woodside Finance Ltd	AU	AU	BBB+	4.5	USD	120.74	600,000,000	AT MATURITY
31	CitiPower I Pty Ltd	AU	AU	BBB+	4.6	AUD	139.80	150,000,000	CALLABLE
32	Holcim Finance Australia Pty Ltd	AU	CH	BBB	4.6	AUD	122.29	200,000,000	AT MATURITY
33	Amcor Ltd/Australia	AU	AU	BBB	4.6	EUR	108.41	550,000,000	AT MATURITY
34	Brisbane Airport Corp Pty Ltd	AU	AU	BBB	4.8	AUD	99.56	200,000,000	AT MATURITY
35	Premier Finance Trust Australia	AU	AU	BBB-	5.0	AUD	158.29	190,000,000	AT MATURITY
36	Origin Energy Finance Ltd	AU	AU	BBB	5.1	EUR	142.42	500,000,000	AT MATURITY
37	DBNGP Finance Co Pty Ltd	AU	AU	BBB-	5.1	AUD	156.59	300,000,000	CALLABLE
38	Coca-Cola Amatil Ltd	AU	AU	BBB+	5.2	AUD	56.20	150,000,000	AT MATURITY
39	Incitec Pivot Finance LLC	US	AU	BBB	5.3	USD	188.72	800,000,000	AT MATURITY
40	Incitec Pivot Finance LLC	US	AU	BBB	5.3	USD	188.72	800,000,000	AT MATURITY
41	Barrick PD Australia Finance Pty Ltd	AU	CA	BBB	5.4	USD	112.54	400,000,000	AT MATURITY
42	SGSP Australia Assets Pty Ltd	AU	AU	BBB+	5.5	AUD	156.61	150,000,000	AT MATURITY
43	Brambles USA Inc	US	AU	BBB+	5.6	USD	128.61	500,000,000	AT MATURITY
44	Brambles USA Inc	US	AU	BBB+	5.6	USD	124.68	500,000,000	AT MATURITY
45	Adani Abbot Point Terminal Pty Ltd	AU	AU	BBB-	5.7	AUD	265.10	100,000,000	AT MATURITY
46	Coca-Cola Amatil Ltd	AU	AU	BBB+	5.7	AUD	61.18	205,000,000	AT MATURITY
47	Leighton Finance USA Pty Ltd	AU	AU	BBB-	5.9	USD	309.43	115,000,000	AT MATURITY
48	APT Pipelines Ltd	AU	AU	BBB	5.9	AUD	142.76	300,000,000	AT MATURITY
49	Perth Airport Pty Ltd	AU	AU	BBB	5.9	AUD	104.44	150,000,000	AT MATURITY
50	QPH Finance Co Pty Ltd	AU	AU	BBB	5.9	AUD	114.38	300,000,000	AT MATURITY

No.	Bond	Country of Domicile	Country of Risk	S&P Credit Rating	Years to maturity	Currency	Spread to Swap with Cross Currency Conversion (7 Day Average in bp)	Amount (A$)	Redemption
51	Asciano Finance Ltd	AU	AU	BBB-	6.0	USD	175.51	600,000,000	AT MATURITY
52	Asciano Finance Ltd	AU	AU	BBB-	6.0	USD	174.59	600,000,000	AT MATURITY
53	Brisbane Airport Corp Pty Ltd	AU	AU	BBB	6.1	AUD	103.85	350,000,000	AT MATURITY
54	Origin Energy Finance Ltd	AU	AU	BBB	6.1	EUR	154.53	750,000,000	AT MATURITY
55	Aurizon Network Pty Ltd	AU	AU	BBB+	6.1	AUD	119.93	525,000,000	AT MATURITY
56	Coca-Cola Amatil Ltd	AU	AU	BBB+	6.2	AUD	68.68	100,000,000	AT MATURITY
57	SGSP Australia Assets Pty Ltd	AU	AU	BBB+	6.4	GBP	168.96	250,000,000	AT MATURITY
58	Sydney Airport Finance Co Pty Ltd	AU	AU	BBB	6.5	USD	126.04	500,000,000	AT MATURITY
59	Sydney Airport Finance Co Pty Ltd	AU	AU	BBB	6.5	USD	126.02	500,000,000	AT MATURITY
60	SGSP Australia Assets Pty Ltd	AU	AU	BBB+	6.5	AUD	120.34	350,000,000	AT MATURITY
61	Perth Airport Pty Ltd	AU	AU	BBB	6.5	AUD	108.13	400,000,000	AT MATURITY
62	Woodside Finance Ltd	AU	AU	BBB+	6.7	USD	121.31	700,000,000	CALLABLE
63	Woodside Finance Ltd	AU	AU	BBB+	6.7	USD	121.20	700,000,000	CALLABLE
64	Coca-Cola Amatil Ltd	AU	AU	BBB+	6.7	AUD	77.36	100,000,000	AT MATURITY
65	QPH Finance Co Pty Ltd	AU	AU	BBB	6.8	AUD	121.74	200,000,000	AT MATURITY
66	Coca-Cola Amatil NZ Ltd	AU	AU	BBB+	6.9	AUD	86.29	45,000,000	AT MATURITY
67	Coca-Cola Amatil Ltd	AU	AU	BBB+	6.9	AUD	79.92	100,000,000	AT MATURITY
68	Powercor Australia LLC	AU	AU	BBB+	6.9	AUD	122.28	300,000,000	AT MATURITY
69	Coca-Cola Amatil Ltd	AU	AU	BBB+	7.1	AUD	87.48	30,000,000	AT MATURITY
70	Origin Energy Finance Ltd	AU	AU	BBB	7.1	EUR	165.14	800,000,000	AT MATURITY
71	Origin Energy Finance Ltd	AU	AU	BBB	7.1	EUR	165.35	800,000,000	AT MATURITY
72	Origin Energy Finance Ltd	AU	AU	BBB	7.1	USD	164.77	500,000,000	AT MATURITY
73	Origin Energy Finance Ltd	AU	AU	BBB	7.1	USD	165.13	500,000,000	AT MATURITY
74	Newcrest Finance Pty Ltd	AU	AU	BBB-	7.2	USD	291.43	750,000,000	AT MATURITY
75	Newcrest Finance Pty Ltd	AU	AU	BBB-	7.2	USD	291.10	750,000,000	AT MATURITY
76	Sydney Airport Finance Co Pty Ltd	AU	AU	BBB	7.2	AUD	128.83	200,000,000	AT MATURITY
77	Powercor Australia LLC	AU	AU	BBB+	7.4	AUD	117.87	630,000,000	AT MATURITY
78	SGSP Australia Assets Pty Ltd	AU	AU	BBB+	7.8	EUR	146.45	500,000,000	AT MATURITY
79	Coca-Cola Amatil Ltd	AU	AU	BBB+	7.8	AUD	85.28	30,000,000	AT MATURITY
80	Newcrest Finance Pty Ltd	AU	AU	BBB-	8.1	USD	317.15	750,000,000	AT MATURITY
81	Newcrest Finance Pty Ltd	AU	AU	BBB-	8.1	USD	318.79	750,000,000	AT MATURITY
82	APT Pipelines Ltd	AU	AU	BBB	8.1	USD	179.76	750,000,000	AT MATURITY
83	APT Pipelines Ltd	AU	AU	BBB	8.1	USD	179.70	750,000,000	AT MATURITY
84	Sydney Airport Finance Co Pty Ltd	AU	AU	BBB	8.1	AUD	121.61	750,000,000	AT MATURITY
85	Leighton Finance USA Pty Ltd	AU	AU	BBB-	8.2	USD	318.25	500,000,000	AT MATURITY
86	Leighton Finance USA Pty Ltd	AU	AU	BBB-	8.2	USD	318.58	500,000,000	AT MATURITY
87	Sydney Airport Finance Co Pty Ltd	AU	AU	BBB	8.5	USD	148.58	825,000,000	AT MATURITY
88	Sydney Airport Finance Co Pty Ltd	AU	AU	BBB	8.5	USD	148.78	825,000,000	AT MATURITY
89	Amcor Ltd/Australia	AU	AU	BBB	8.5	EUR	143.53	300,000,000	AT MATURITY
90	Origin Energy Finance Ltd	AU	AU	BBB	8.6	EUR	201.81	150,000,000	AT MATURITY
91	Asciano Finance Ltd	AU	AU	BBB-	8.6	USD	213.40	250,000,000	AT MATURITY
92	Asciano Finance Ltd	AU	AU	BBB-	8.6	USD	213.50	250,000,000	AT MATURITY
93	SGSP Australia Assets Pty Ltd	AU	AU	BBB+	8.6	USD	177.71	500,000,000	AT MATURITY
94	Asciano Finance Ltd	AU	AU	BBB-	9.0	GBP	221.71	300,000,000	AT MATURITY
95	Sydney Airport Finance Co Pty Ltd	AU	AU	BBB	9.6	EUR	143.64	700,000,000	AT MATURITY
96	Brambles Finance Ltd	AU	AU	BBB+	9.8	EUR	147.84	500,000,000	CALLABLE
97	APT Pipelines Ltd	AU	AU	BBB	10.2	GBP	186.79	350,000,000	AT MATURITY
98	Caltex Australia Ltd	AU	AU	BBB-	23.0	AUD	450.00	550,000,000	CALLABLE
99	Barrick PD Australia Finance Pty Ltd	AU	CA	BBB	25.1	USD	275.84	834,000,000	AT MATURITY
100	Newcrest Finance Pty Ltd	AU	AU	BBB-	27.2	USD	387.41	500,000,000	AT MATURITY
101	Newcrest Finance Pty Ltd	AU	AU	BBB-	27.2	USD	387.17	500,000,000	AT MATURITY
102	Santos Finance Ltd	AU	AU	BBB	56.0	EUR	361.21	1,000,000,000	CALLABLE

Appendix 6 Term spread versus swap strategies

1. Given the current absence of a liquid Credit Default Swaps market in Australia, and consistent with Lally (see paragraph 831 in the draft decision), the Authority is of the view that the term of the debt risk premium should be 10 years.[666] To this end, the Authority has developed estimates of the 10 year 'spread to swap' (see paragraph 882 of the draft decision). However, there is a need to estimate a regulatory debt risk premium (**DRP**) – with a term of 10 years – that accords with the intention to set the risk free rate on the basis of Commonwealth Government Securities with a 5 year term.

2. First, there is a need to account for the difference between the IRS rate and the risk free rate (**RFR**) on Commonwealth Government Securities (**CGS**). Adding the '10 year IRS spread to 10 year RFR' (purple segment in Figure 44) to the 10 year spread to swap (blue segment Figure 44) gives the 10 year debt risk premium (**DRP**) – this is shown in each bar in Figure 44. The 10 year DRP is thus defined as the credit spread to the 10 year risk free rate, rather than the spread to 10 year IRS.

3. Second, there is a need to account for the difference between the 10 year risk free rate, and the five year risk free rate used in estimating the regulated cost of debt (recalling that the Authority is basing the risk free rate on the five year CGS risk free rate - see paragraph 824 of the draft decision). To this end, two alternative methods require consideration, whether to adopt a:

   - a term spread approach – by adding the 10 year DRP to the 5 year risk free rate and 10 - 5 year term spread (in orange as shown in the first bar in Figure 44) – this would be consistent with ATCO's proposal;[667] or
   - a swaps approach – by adding the 10 year DRP to the 5 year risk free rate and 10 to 5 year swap costs (shown in red in the second and third bar in Figure 44) – this would be consistent with Lally's Option 3 approach outlined in paragraph 834.

4. The key factor in deciding whether the first or second method should be adopted is whether the 10 to 5 year swap costs (shown in red in Figure 44) are greater or less than the 10 - 5 year term spread (in orange as shown in the first bar in Figure 44). The case where the term spread is greater than the swap cost is depicted by the second bar. The case where the term spread is less than the swap cost is depicted

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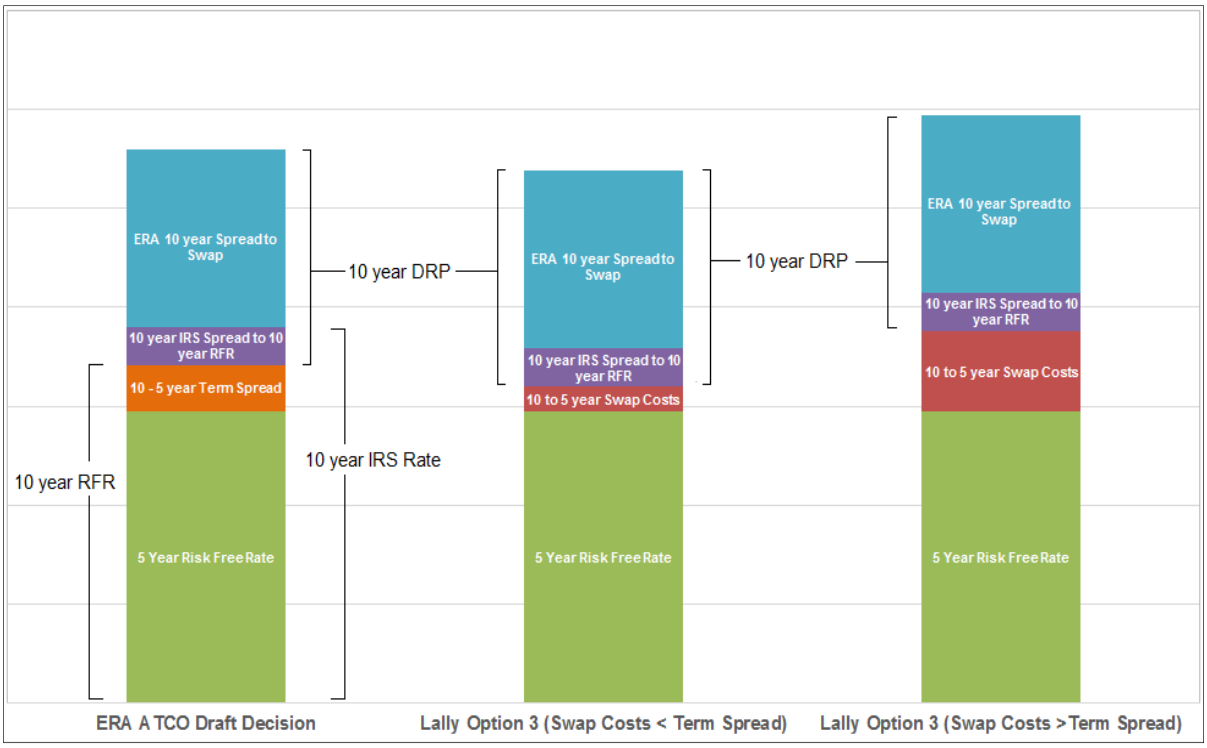
666 The Authority will reassess the conditions for this market in future decisions. Should this market return to more normal conditions, then the term for estimating the spread to swap would be revised to 5 years in order to be consistent with the term of the risk-free rate and the 'NPV = 0' present value principle.

667 To calculate the 10 year debt risk premium the '10 year IRS spread to the 10 year risk free rate' may be added to the Authority's estimate of the '10 year spread to swap'. The Authority's 10 year spread to swap estimate is shown in blue in Figure 43 while the 10 year IRS spread to the 10 year risk free rate is shown in purple.

The rationale is that the 10 year spread to swap estimated by the Authority will be less than the 10 year debt risk premium. The spread to swap is smaller than the debt risk premium because the debt risk premium is the premium over and above the 10 year risk free rate while the 10 year spread to swap is the premium over and above the 10 year IRS. The 10 year IRS Rate is greater than the 10 year risk free by an amount equal to the 10 year IRS spread to the 10 year risk free rate. This is shown diagrammatically on the first bar of Figure 43.

by the third bar. The Authority will apply the method which results in the lowest *expected* cost of debt.[668]

Figure 44 Decomposition of the Cost of Debt under the 'Term Spread' and 'Swaps' Approaches to determining the Regulated Debt Risk Premium



Source: Economic Regulation Authority

5. The term spread and swap costs vary with time. If the expected term spread is lower than expected swap costs, it is more efficient to incorporate the term spread instead of swap costs. That is, the efficient firm would fix at the ten year rate, rather than swapping ten year floating for five year fixed. This issue was raised by Jemena in their 2013 Rate of Return Guidelines submission to the Australian Energy Regulator.[669] The Authority therefore views the comparison of expected swap costs to the expected term spread in determining the regulated rate of return as consistent with the efficient industry debt management practice.

6. The reconciliation of the term spread and the swaps approach are discussed below.

Lally's swap costs versus the term spread

7. Lally's swaps strategy outlined as Option 3 can be characterised as the 10 year debt risk premium (**DRP**) plus swap costs and the 5 year risk free rate of return:

$$\text{Option 3 } CoD = 10\ yr\ DRP + Swap\ Costs + 5\ yr\ Risk\ Free\ Rate \qquad 1)$$

668 As opposed to the lowest cost of debt based on swap cost and term spreads immediately prevailing – as discussed below historical term spreads are likely to be a better predictor of term spread than those prevailing on the day.

669 Jemena, *Rate of Return Guidelines – Consultation Paper: Submission from Jemena Limited to the Australian Energy Regulator*, June 2013, p. 27.

where $Swap\ Cost$ is the cost of swap contracts to convert the 10 year risk free rate embedded in the average debt term into a 5 year risk free rate.

8. The 10 year cost of debt based on the Authority's estimates of the 10 year spread to swap is defined as:

$$10\ yr\ CoD = 10\ yr\ IRS\ Rate + 10\ yr\ Spread\ to\ Swap \qquad 2)$$

9. The 10 year debt risk premium is the equivalent of the 10 year cost of debt less the 10 year risk free rate.

$$10\ yr\ DRP = 10\ yr\ CoD - 10\ yr\ Risk\ Free\ Rate \qquad 3)$$

10. Substituting equation 2) into equation 3) we have:

$$\begin{aligned} 10\ yr\ DRP = {} & 10\ yr\ IRS\ Rate + 10\ yr\ Spread\ to\ Swap \\ & - 10\ yr\ Risk\ Free\ Rate \end{aligned} \qquad 4)$$

11. Substituting 4) into equation 1) we can express Lally's Option 3 in terms that are used to compose the Authority's 10 year debt risk premium:

$$\begin{aligned} \text{Option 3}\ CoD = {} & (10\ yr\ IRS\ Rate + 10\ yr\ Spread\ to\ Swap) \\ & - 10\ yr\ Risk\ Free\ Rate \\ & + Swap\ Costs + 5\ yr\ Risk\ Free\ Rate \end{aligned} \qquad 5)$$

12. Re-substituting 2) back into 4) and collecting the 10 and five year risk free rate together on the same line we have:

$$\begin{aligned} \text{Option 3}\ CoD = {} & 10\ yr\ CoD \\ & + 5\ yr\ Risk\ Free\ Rate - 10\ yr\ Risk\ Free\ Rate \\ & + Swap\ Costs \end{aligned} \qquad 6)$$

13. Note that the term spread can be expressed as:

7)

$$5\ yr\ Risk\ Free\ Rate - 10\ yr\ Risk\ Free\ Rate$$
$$=$$
$$-(10\ yr\ Risk\ Free\ Rate - 5\ yr\ Risk\ Free\ Rate)$$
$$=$$
$$-\ Term\ Spread$$

14. Using 7), another way of expressing Lally's Option 3 is that it is the Authority's 10 year cost of debt calculation with swap costs put in place of the term spread between the 10 and 5 year risk free rate. That is:

$$\text{Option 3 } CoD = 10\ yr\ CoD - Term\ Spread + Swap\ Costs \qquad 8)$$

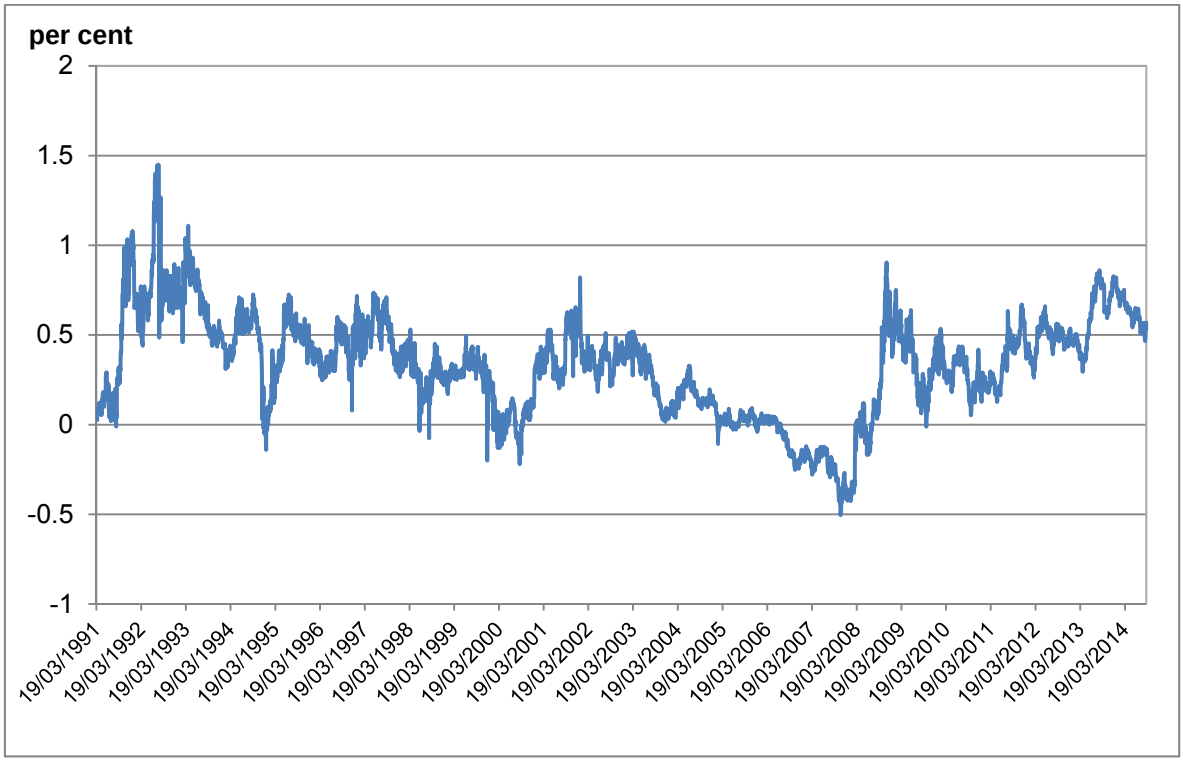
15. The implication here is that difference between the Authority's term spread debt risk premium and Lally's Option 3 swaps approach is that the term spread is replaced with swap costs.

The term spread between 10 and 5 year Government bonds

16. This section considers the behaviour of the term spread, and develops an estimate for use in the term spread approach to estimating the regulatory debt risk premium.

17. The 10 and 5 year Australian Commonwealth Government bond index is available on Bloomberg as consistent pairs as far back as March 1991. The term spread series is plotted in Figure 45 below.

Figure 45 Term Spread between 10 and 5 year Commonwealth Government Bonds



Source: Bloomberg, ERA Analysis

18. Consistent with Campbell Harvey's finding that the yield curve tends to invert before economic downturns, it may be observed that the 5 year yield is greater than the 10 year yield (resulting in a negative spread) around the 2000 'dot com' bubble and 2008 Global Financial Crisis.[670] At these times (conversely) the yield on 10 year bonds is lower than that on 5 year bonds with the implication that long term debt is a more cost effective financing strategy.

19. An important feature of this series is that it is stationary, that is, *mean reverting*, by virtue of the fact that the 10 and 5 year risk free rate are cointegrated. Cointegration implies that although each series may move around in a seemingly arbitrary fashion, they will never drift infinitely far apart, behaving as if they are *tethered* to one another.[671] The corollary is that the long term average of the term spread can be used as a meaningful predictor of the future term spread. The long term average term spread and the future term spread are shown in Table 82.

Table 82 Long Term and 40 Day Average Term Spread as at September 2014

	Long Term Average	40 Day Average
Term Spread (%)	0.329	0.520
Observations	6033	40

Source: Bloomberg, ERA Analysis

670 C. Harvey, Forecasts of Economic Growth from the Bond and Stock Markets, *Financial Analysts Journal*, Vol. 45, No. 5 September – October, 1989, pp. 38-45.

671 Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, December 2013, pp. 106-107.

20. The best forecast of the *expected* term spread is 0.329 percent or 33 basis points. This expected term spread forecast is more appropriate than the 40 day average 'on the day' forecast because the term spread is mean reverting. This expected term spread sets a benchmark that swap costs can be evaluated against for the purpose of setting the lowest cost of debt.

Swap costs

21. This section considers estimates of the swap costs used to replace the term spread in the swaps cost approach.

22. In order to determine swap costs a benchmark swap contract or contracts must be structured. The structure implicit in Lally's 'Option 3' is the use of a swap to convert the embedded 10 year risk free rate component into a 5 year risk free rate. This is based on the view that the average term of the firm's debt is 10 years and the regulated risk free rate will be reset every five years.

23. Evans & Peck conducted an analysis for the QCA in 2013 and reported the following swap costs

Table 83 Evans & Peck BBB Swap Pricing (basis points) as at 22 January 2013

Term	5 Year	10 Year	Both Swaps
Execution Spread	3	4	7
Risk Spread	4	6	9
Total	7	10	**16**

Source: Evans & Peck (2013), ERA Analysis

24. The Authority is of the view that a similar, but more up to date analysis that includes all costs involved in a benchmark swap must be undertaken to compare the efficiency of swap costs vis-à-vis the inclusion of the term spread before the final decision is made. The benchmark swap cost for comparison with the expected term spread forecast will be established by the Authority at the time of the final decision.

Conclusion

25. The Authority is still working to develop a robust, up to date estimate of the swaps cost approach.

26. For the purposes of this draft decision the Authority will therefore adopt the expected term spread in place of the swap costs approach.

Appendix 7 Carry forward to account for the annual update to the debt risk premium

1. The Authority considers that the following revised approach retains the properties of the annual update with regard to efficiency, as it ensures that ATCO faces the prevailing annual debt risk premium at any point in time. However, the approach would also deliver a single rate of return to apply in each access arrangement, thereby allowing a stable tariff path.

2. First, the debt risk premium for the fourth access arrangement period (AA4) would be estimated 'on the day' at the start of the regulatory period. The debt risk premium would be calculated as the 40 day average of the daily rates determined using the Authority's revised bond yield approach, set out above. This actual rate would be published at the commencement of the access arrangement, after the elapse of the 40 days, in line with the Authority's usual practice.

3. Second, the debt risk premium *to apply* for AA4 would be based on the estimated rate determined in the first step, but would be required to fall within the bounds of 100 to 300 basis points, as 'guide rails'. An estimated 'on the day' debt risk premium above 300 basis points would be constrained to 300 for the duration of the access arrangement, and a debt risk premium below 100 would be constrained to 100. This is to ensure that the rate set for the duration of the access arrangement is not influenced by unusually low or high prevailing conditions, such as occurred during the global financial crisis.

4. The resulting 'guide rails' debt risk premium would then apply for the whole of the AA4 period.

5. Third, the Authority would publish the annually updated debt risk premium at the start of each of the second to fifth regulatory years of AA4, but not require that this update be reflected in tariffs. The published annual updates would be based on the 40 day average that coincided with the anniversary of the 40 day period used to set the debt risk premium at the start of the access arrangement. Not translating the update to tariffs during the access arrangement period would allow for a stable tariff path.

6. Fourth, at the subsequent regulatory reset for the fifth access arrangement period (**AA5**), the debt risk premium would be set based on the guide rails 'on the day' rate at the start of AA5, similar to AA4. However, the debt risk premium for AA5 will incorporate an adjustment – in present value revenue neutral terms – which will account for the difference between the debt risk premium set at the start of AA4, and the actual annual update outcomes for the debt risk premium that applied in each of the second to fifth years for AA4. In this way, the service provider continues to face during AA4 the cost of debt signal provided by the (published) annually updated debt risk premium, even though the full impact on revenue is not reflected until AA5.

The equivalence of a revenue true up to a DRP adjustment

7. The resulting adjustment to the guide rails debt risk premium to apply for the first year of the AA5 period may be calculated as follows:

$$DRP_{AA5\ year\ 1}^{total\ adjust} =$$

$$DRP_{AA5}^{on\ the\ day} - \sum_{n=1}^{n=5}\left(\left(DRP_{AA4}^{on\ the\ day} - DRP_{AA4}^{year\ n}\right).\ \frac{RAB_{AA4}^{n}}{RAB_{AA5}^{1}}.\ DFF_n\right.$$

where

DRP is the debt risk premium, AA4 is the fourth access arrangement, and AA5 is the fifth access arrangement

$DRP_{AA5}^{total\ adjust}$ is the calculated total 'adjusted guide rails' regulatory DRP, which would apply in year 1 of AA5

$DRP_{AA5}^{on\ the\ day}$ is the on the day 'guide rails' regulatory DRP to apply in AA5, or that applied in AA4 (dependent on the subscript)

$DRP_{AA4}^{year\ n}$ is the actual on the day regulatory DRP outcome published by the ERA for each of the five regulatory years of AA4

$\frac{RAB_{AA4}^{n}}{RAB_{AA5}^{1}}$ is the ratio of RAB in each of regulatory years 1 to 5 of AA4, as compared to the RAB in regulatory year 1 of AA5

DFF_n is the 'discount factor forward' to the first year of AA5, which carries forward a value in the first to fifth year of AA4 to the first regulatory year of AA5 in present value neutral terms.

8. It is feasible to then use a further formula to farm out the resulting 'total' adjustment – calculated above to apply in the *first year* of AA5 – to be an equal adjustment to the on the day regulatory debt risk premium to apply in *each year* of AA5. The approach requires further adjustments to allow for the different size of the RAB in each subsequent regulatory year of AA5, and also an adjustment to retain equivalence in present value terms. The resulting formula would have similar characteristics to the formula set out above.

9. The result of application of the two formulas would be a single regulatory debt risk premium to apply for AA5, which accounted for both:

- the on the day 'guiderails' regulatory debt risk premium estimated at the start of AA5; and
- the automatic adjustment to account for the differences between the actual reported outcome for the debt risk premium in each regulatory period AA4, and the regulatory debt risk premium that applied from the beginning of AA4.[672]

[672] In the unlikely event that the adjustment for AA4 needed to reduce the AA5 guiderails debt risk premium below 100 basis points, then the AA5 guiderails estimate of 100 basis points would be retained for AA5 and the AA4 adjustment and AA5 adjustments (in the event that the current approach was retained for AA5) would be carried forward to AA6 in present value neutral terms. A similar rule would apply for adjustments which would push the adjusted AA5 guiderails estimate to in excess of 300 basis points.

10. However, a simpler, equivalent, approach to calculating the single regulatory debt risk premium to apply for AA5 – that is equivalent to the formulas set out above – would be first to estimate the revenue difference in AA4 between the cashflow with the actual debt risk premium and the cashflow with the regulatory debt risk premium, all other things equal. This difference would be carried forward to the first year of AA5, in present value neutral terms, and then deducted from the required target revenue for AA5 calculated with the on the day (guiderails) debt risk premium for AA5. The on the day debt risk premium for AA5 would then be adjusted back to achieve the target revenue outcome for AA5. The resulting adjusted debt risk premium – to apply for all years of AA5 – would account for the differences during AA4 in the actual published debt risk premium and the regulated debt risk premium set at the start of AA4.

Basis for the annual update

11. The Authority's assessment is that the resulting adjustment to the on the day (guide rails) cost of debt in AA5 under most scenarios would be less than 20 basis points. Based on the RBA's 10 year credit spread (to CGS) monthly data, since January 2005, the average total net adjustment required at the next regulatory reset could be around 100 basis points, depending on whether the actual average DRP was calculated on the basis of the 5 year annual trailing average (104 basis points in column B in Table 84) or the 60 months trailing average (98 basis points in column C in Table 84). When applied over each of five years, the total approximate 100 basis points adjustment could be effected by a (100/5=) 20 basis point adjustment to the debt risk premium to apply in AA5.[673]

12. The maximum/minimum total adjustment could be around 260 basis points. However, such a large adjustment reflects the impact of the global financial crisis. This large total adjustment would be effected by an approximate (260/5=) 52 basis point adjustment to the debt risk premium to apply in AA5.

[673] This does not account for the requirement to account for present value impacts, or adjustments that account for the relative size of the regulatory asset base (**RAB**). However, these are second order issues. The raw figures presented here give a sense of the order of magnitude of the required adjustment in AA5.

Table 84 Carry forward DRP differences based on RBA credit spread data

	(A) RBA non-financial BBB-rated bonds swap to spread	(B) Delta of 5 yr ANNUAL average DRP to DRP set five years earlier (within 100/300 guide rails)	(C) Delta of 60 MONTH average DRP to DRP set five years earlier (within 100/300 guide rails)
Average Jan 2005 to Aug 2014 (basis pts)	222	104	98
Maximum value Jan 2005 to Aug 2014 (basis pts)	897	260	185
Minimum value Jan 2005 to Aug 2014 (basis pts)	45	-70	-49

Source: Economic Regulation Authority's analysis, based on Reserve Bank of Australia, Interest rates: aggregate measures of Australian corporate bond spreads and yields, Table f03, www.rba.gov.au/statistics/tables/index.html, accessed September 2014.

13. The Authority notes the differences between the actual average DRP calculated on the basis of the 5 year annual average (column B in Table 84), as opposed to the 60 months average (column C in Table 84). However, the differences are not large. As there is significantly less work associated with the 5 year annual average approach (collecting data and estimating the regulatory debt risk premium for 40 days each year) as opposed to the 60 month average (collecting data and estimating the regulatory debt risk premium every day for five years), the Authority considers that it will adopt the 5 year annual average approach.

Appendix 8 The estimation of gamma

1. Prior to 1987, company profits were first taxed at the company level, and taxed again in the form of dividends paid out to shareholders as personal income tax. The imputation tax system avoids corporate profits being taxed twice. Under the Australian imputation tax system, a franking credit is distributed to individuals with dividends to offset personal taxation liability. The franking credit represents the amount of personal taxation already paid at the corporate level, therefore preventing corporate income being taxed twice. Imputation credits in Australia have a face value of one dollar per credit which can be claimed as a rebate to offset personal tax liabilities. Since 1 July 2000, a refund on any excess credits over personal tax liabilities can be claimed. However, international investors cannot utilise imputation tax credits; imputation tax credits only provide benefits to Australian investors.

The Officer framework and the NGR

2. The theoretical framework for examining how franking credits alter the weighted average cost of capital (**WACC**) was proposed by Officer (1994).[674] Under the Officer CAPM, a segmented domestic capital market is assumed. By considering the Earnings Before Interest and Tax (**EBIT**) of a company, and how it is distributed between the government (via taxation), debt holders and equity holders the firm's before tax WACC can be derived. A firm's EBIT is distributed as follows:

$$X_O = X_G + X_D + X_E$$

where

X_O is operating income

X_G is the government's share of operating income (taxation),

X_D is the debt holders share of operating income, and

X_E is the equity holder's share of operating income

3. Under an imputation tax system, companies 'pre-collect' personal income tax for governments when they pay company tax. The proportion of the tax collected from the company which will be rebated against personal tax is the parameter gamma. It is convenient to consider gamma as the proportion of personal income tax collected at the company level. As a consequence, the effective company taxation is defined as:

$$\begin{aligned} X_G &= T(X_O - X_D) - \gamma T(X_O - X_D) \\ &= T(X_O - X_D)(1-\gamma) \end{aligned}$$

4. Therefore, in this representation, gamma is the proportion of tax collected from the company which gives rise to franking credits. Gamma can be considered as the proportion of company tax that is used as prepayment of personal tax liabilities.[675]

674 R.R. Officer, "The Cost of Capital of a Company Under an Imputation Tax System", *Accounting & Finance,* 1994, pp. 1-17.

675 N.J. Hathaway and R.R. Officer, *The Value of Imputation Tax Credits*, Working paper, Melbourne Business School, (2004).

5. Substituting into EBIT yields:

$$X_0 = T(X_0 - X_D)(1-\gamma) + X_D + X_E$$

Solving for X_0:

$$X_0 = \frac{X_E}{(1 - T(1-\gamma))} + X_D$$

6. The weighted average cost of capital can be derived by substituting the perpetuity definitions of value.

Let

$$E = \frac{X_E}{r_e} \quad D = \frac{X_D}{r_D} \text{ and } V = \frac{X_O}{r_O}$$

where

E is the value of equity;
r_e is the required rate of return to equity holders after-company tax but before-personal tax;
D is the value of debt;
V is the sum of debt and equity;
r_D is the required return to debt holders after tax, i.e. the cost of debt capital; and
r_C is the required return before taxes or the before-tax weighted average cost of capital (WACC).

7. Substituting these definitions yields the pre-tax cost of capital:

$$r_o = \frac{r_e}{(1 - T(1\text{-}\gamma))} \cdot \frac{E}{V} + r_d \cdot \frac{D}{V} \qquad (1)$$

8. As may be observed in equation 1, under a pre-tax WACC framework, the impact of imputation credits on effective corporate tax rates are incorporated in the WACC itself, such that the gamma (γ) becomes a WACC parameter.

9. Under the National Gas Rules (**NGR**), the required form of the WACC is the nominal vanilla post tax WACC as follows:[676]

$$WACC_{vanilla} = E(r_e)\frac{E}{V} + E(r_d)\frac{D}{V} \qquad (2)$$

where

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

[676] NGR 87(4).

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

E/V is the proportion of equity in total financing (comprising equity and debt); and

D/V is the proportion of debt in total financing.

10. Under a post-tax WACC framework, imputation credits are not included in the WACC formula set out in equation 2, but rather integrated as a component of the building block model, with the estimate of gamma applied to reduce the corporate tax component of the regulated entity. Accordingly, equation 2 differs from equation 1, in that the γ parameter is not a component of the rate of return. Rather, under rule 87A of the NGR, the post tax revenue model compensates for the impact of franking credits in a separate building block allowance (rule 87A is set out in paragraph 924). Rule 87A recognises that the effective taxation cashflow of the regulated firm is the proportion of corporate income tax that is not returned to investors via imputation credits. The gamma proportion of corporate income tax is effectively a holding tax, representing pre-payment of investors' personal tax, and hence is not required to be compensated in the building block cashflows.

11. The proportion of corporate tax reduced by franking credits, gamma (γ), may be factored into two components:

- the fraction of imputation credits created that are assumed to be distributed to shareholders (F);
- the proportion of imputation credits distributed that are redeemed – the utilisation rate (θ).

12. It follows that gamma can be represented by the formula set out in equation (3) below:

$$\gamma = F.\ \theta \qquad (3)$$

13. This is known as the Monkhouse formula.[677]

The Authority's position set out in the Rate of Return Guidelines

14. The Authority's prior position regarding the gamma parameter – set out in the Rate of Return Guidelines – accounted for stakeholder input and a range of consultants' reports, as well as the Australian Competition Tribunal's (**ACT**) ruling in the application by Energex Limited.[678]

15. With regard to the distribution rate *F*, the ACT concluded that 0.7 was the appropriate value for use in the estimation of gamma. The Authority was not aware

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677 This follows the analysis by Monkhouse in relation to the impact of imputation credits on the effective tax rate of companies. See equation 2.5 in P. Monkhouse, The valuation of projects under the dividend imputation tax system, *Accounting and Finance*, 36, 1996, p. 192.

678 Australian Competition Tribunal, *Application by Energex Limited (No 2) [2010] ACompT7*, October 2010; Australian Competition Tribunal, *Application by Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] ACompT9*, October 2010' Australian Competition Tribunal, *Application by Energex Limited (Gamma) (No 5) [2011] ACompT*, 9 May 201.

of any new information with regard to the distribution rate since the ACT decision. As a consequence, the Authority retained the value of 0.7 for the distribution rate for the Rate of Return Guidelines.[679]

16. On the estimate of the utilisation rate *θ*, the ACT relied solely on the use of dividend drop off studies to reach its decision. Of particular note, the ACT chose to disregard the use of the Beggs and Skeels (2006) study.[680] The ACT concluded that SFG's final 2011 study was the best dividend drop off study available, and as a consequence, the Tribunal used the results of the study in its determination of the utilisation rate *θ*. The ACT ruled that an appropriate value for gamma is 0.25, which reflected a value for the distribution rate *F* of 0.70 and a value of *θ* of 0.35.

17. The Authority undertook its own dividend drop off estimation study during the development of the Rate of Return Guidelines, which clearly showed the sensitivity of dividend drop off estimates of *θ* to data selection. Taking into account the findings the 2011 SFG study (subsequently updated by SFG in 2013), and its own 2013 study, the Authority considered that the appropriate range for the utilisation rate, θ, was 0.35 - 0.55.

Table 85 Estimated value of theta from relevant dividend drop-off studies

Author	Year	Data	*θ*
SFG[681]	2011/ 2013	DatAnalysis, 2000 -2010	0 - 0.35
ERA[682]	2013	Bloomberg, 2001 -2012	0.35 – 0.55

Source: Compiled by the Economic Regulation Authority

18. The Authority's resulting estimate for gamma was in the range of 0.25 to 0.385.

19. The Authority notes the ACT's comment in its decision that the estimate of gamma is an 'ongoing intellectual and empirical endeavour'.[683] In particular, the ACT noted the following:[684]

> The Tribunal has found some deficiencies in its understanding of the foundations of the task facing it, and the AER, in determining the appropriate value of gamma. These issues have not been explored so far because they have not arisen between the parties, who appear to be in agreement about how the Rules should be interpreted regarding the treatment of corporate income tax. They may be matters that the Tribunal

679 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au, 16 December 2013, p. 208.

680 D.J. Beggs and C.L. Skeels, 'Market Arbitrage of Cash Dividends and Franking Credits', *The Economic Record*, vol. 82, no 258, 2006, pp. 239–252.

681 SFG Consulting, Dividend drop-off estimate of theta: final report, 21 March 2011.

682 D. Vo, B. Gellard, B. and S. Mero, 'Estimating the Market Value of Franking Credits, Empirical Evidence from Australia' Conference Paper, Australian Conference of Economists 2013.

683 Australian Competition Tribunal, *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9*, 12 May 2011, paragraph 45.

684 Australian Competition Tribunal, *Application by Energex Limited (No 2) [2010] ACompT* October 2010, paragraph 149.

will take up in its further decision in these matters; or they may best be left until the next WACC review. Indeed, they may go to the basis for the Rules themselves.

20. In light of this, and given new evidence regarding the gamma parameter since the publication of the Rate of Return Guidelines, the Authority considers that the method for estimating the gamma parameter warrants re-examination. That new evidence relates principally to two reports by Lally in late 2013:

- the first, for the Australian Energy Regulator (AER), explores the theoretical underpinnings of gamma, and evaluates the appropriateness of various methodologies for estimating the utilisation rate parameter, θ;685 and
- the second, for the Queensland Competition Authority (QCA), provides new estimates of the distribution rate parameter, F.[686]

21. The Authority considers that Lally's material advances the regulatory debate regarding the impact of imputation credits. As a consequence, the Authority has re-examined the gamma parameter for the purposes of this draft decision. In the process, the Authority has taken into account Lally's reports, as well as:

- SFG Consulting's responses to Lally's reports;
- the conclusions of the AER in responding to Lally's report, set out in its rate of return guidelines;[687] and
- the conclusions of the QCA in its recent cost of capital determination, which also considered the foregoing material.[688]

Lally's findings with regard to the estimation of gamma

22. The recent work by Lally provides estimates of the distribution rate *F* and the utilisation rate *θ*.

Distribution rate

23. Lally reviewed estimates of the distribution rate in a report to the QCA in November 2013.[689] Lally established new estimates of the distribution rate based on the financial reports for the 10 largest ASX companies over the period 2000 to 2013. The aggregate average was 85 per cent.

24. SFG Consulting subsequently criticised Lally's estimates as being, among other things, subject to potential error, based on a small sample, and inferior to the previous estimate of 70 per cent based on Australian Taxation Office (**ATO**) data.[690]

25. However, Lally notes that NERA analysis points to discrepancies with the ATO estimates, as well as potential bias due to reporting issues. Lally argues that the

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685 M. Lally, *The Estimation of Gamma,* Report for the AER, 21 November 2013.

686 M. Lally, *Estimating Gamma*, Report for the QCA, 25 November 2013.

687 Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, www.aer.gov.au, December 2013.

688 Queensland Competition Authority, *Final decision: cost of capital: market parameters*, August 2014.

689 M. Lally, *Estimating Gamma*, Report for the QCA, 25 November 2013.

690 SFG Consulting, *An appropriate regulatory estimate of gamma*, Report for Aurizon Ltd, 16 January 2014.

ASX financial report data is audited, and that his technique to extract the data avoids reporting and aggregation problems.[691]

26. In response to SFG's critique, Lally extended the sample from 10 to 20 firms, giving coverage of 62 per cent of the ASX 200 by capitalisation. That exercise suggested that the approach is robust to the sample size considered, finding that the average distribution rate is about 84 per cent.[692]

Utilisation rate

27. In his November 2013 advice to the AER, Lally outlines his interpretation of gamma in the Officer CAPM framework.[693] Lally surveys the relevant literature regarding how gamma is interpreted, and notes that a definition of the utilisation rate as being '...the weighted-average over the utilisation rates of all investors in the market, with the weights reflecting both value and risk aversion…' concurs with the academic literature, specifically that of Monkhouse and Lally et al.[694,695] Treating the utilisation rate θ as a value-weighted average over investors implies that the risk aversion of each investor is uncorrelated with the ability to utilise franking credits. **Note that Lally refers to the utilisation rate in terms of the parameter U, which the Authority considers interchangeably with the parameter θ in what follows – that is, the two parameters refer to the utilisation rate, and are equivalent.**

28. Lally presents criticism of other interpretations of the utilisation rate *U*, in which the value of the imputation credits is seen as a market value interpretation.[696] Lally observes that Officer refers to the gamma parameter as the *value* generated by franking credits, and this is often used in support of a market value interpretation.[697] But Lally disagrees with this assessment, noting that in the same paper Officer defines *U* as the 'proportion of tax collected from the company which gives rise to the tax credit associated with a franked dividend'.[698] The Authority notes that the market value interpretation of the required utilisation rate arises from the ambiguity surrounding Officer's use of the word value; submissions in regulatory proceedings[699] have largely claimed this as the Officer framework requiring a market value interpretation of the utilisation rate, ignoring the second definition provided within the same paper.

29. Lally explores how franking credits have an impact on the cost of capital by first observing that if imputation is interpreted as the process by which personal tax is

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691 M. Lally, Review of submissions to the QCA on the MRP, risk-free rate and gamma, 12 March 2014, p. 29.

692 M. Lally, Review of submissions to the QCA on the MRP, risk-free rate and gamma, 12 March 2014, p. 30.

693 M. Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 12.

694 P .Monkhouse, 'The Cost of Equity under the Australian Dividend Imputation System', *Accounting and Finance,* vol.33(2), 1993, pp. 1-18.

695 M.Lally and T.van Zijl, 'Capital Gains Tax and the Capital Asset Pricing Model', *Accounting and Finance,* vol.43, 2003, pp. 187-210.

696 ENA, Response to the Draft Rate of Return Guideline of the Australian Energy Regulator, 2013.

697 R.R. Officer, "The Cost of Capital of a Company Under an Imputation Tax System", *Accounting & Finance*, 1994, pp. 1-17.

698 M.Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 13.

699 For example, ENA, 2013, Response to the Draft Rate of Return Guideline of the Australian Energy Regulator, 2013

substituted for corporate tax, the standard CAPM is valid under an imputation tax system. However, the taxation rate must now apply to the gross dividend, not the cash dividend.[700] The Officer CAPM extends the CAPM to reflect this interpretation of the imputation taxation system.

30. Lally elaborates, noting in this framework that the equilibrium expected return on equity is as follows:[701]

$$E[\hat{R}] = R_f + \beta_e[E(\hat{R}_m) - R_f] \quad (4)$$

where:

$E[\hat{R}]$ is the expected return of the equity asset;

R_f is the risk free rate;

β_e is the equity beta defined relative to the Australian market portfolio;

$E(\hat{R}_m)$ is the expected rate of return on the Australian market portfolio inclusive of imputation credits to the extent that they can be used.

31. To demonstrate the role franking credits have on the required return on equity, Lally first decomposes the actual return of the market portfolio under an imputation tax system as follows:

$$\hat{R}_m = R_m + \frac{IC_m}{S_m}U \quad (5)$$

where:

R_m is the actual rate of return on the market portfolio excluding franking credits;

U is the utilisation rate of the credits (as noted above, equivalent to θ);

S_m is the current value of the market portfolio;

IC_m is the value of imputation credits related to the assets included in the market portfolio.

32. Therefore, when using the Officer CAPM framework, imputation credits first impact the required return on equity via the estimated value of the market risk premium, $MRP = \hat{R}_m - R_f$.

33. Lally further observes that under an imputation tax system, the present value of equity can be determined by discounting the cash flows arising out of the ownership of the equity, including the benefit from imputation credits, using the rate of return determined in (6). This exercise serves to highlight the utilisation rate required under the Officer framework. Lally notes that in one year, the aggregate cash flow is the

700 The gross dividend is the sum of cash dividends and franking credits, to the extent franking credits can be utilised.

701 M.Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 9.

sum of the expected cash flows to equity holders (Y_1), less the expected company taxation over the year (Tax_1), plus any value derived from the distribution of franking credits. The latter term is defined as $UxIC_1$, where IC_1 is the distributed imputation credits. This can be intuitively interpreted as the proportion of received franking credits that the representative investor is able to utilise.[702]

34. Given the expected value of the equity in year one, S_1, the present value of equity can be deduced by discounting S_1 and the aggregate cash flow using the discount rate in (6) as follows:

$$S_0 = \frac{Y_1 - Tax_1 + IC_1U + S_1}{(1 + E[\widehat{R}])} \qquad (6)$$

35. The term IC_1 is defined in (6) as 'the face value of imputation credits received from ownership of equity over a period of one year'. Given franking credits arise out of the proportion of company tax that is used to reduce personal taxation, it follows that IC_1 can be decomposed into the amount of corporate taxation paid, multiplied by the proportion of company taxes that are distributed as imputation credits (where the latter term is the distribution rate, F, in (3)), or $IC_1 = F.Tax_1$. Equation (6) can then be represented as follows:

$$S_0 = \frac{Y_1 - Tax_1(1 - F \times U) + S_1}{(1 + E[\widehat{R}])} \qquad (7)$$

Where $\gamma = F \times U$ as in (3) (or equivalently, $\gamma = F \times \theta$).

36. The above framework interprets the value of franking credits in the Officer CAPM framework. It is clear from equations (6) and (7) that the cash flows are determined in part by the benefit arising from imputation credits, $UxIC_1$.[703] Moreover, $UxIC_1$ can be interpreted as the proportion of franking credits received that are then redeemed by the representative investor. Lally considers that this 'value' is not a market value, but instead the numerical value arising out of the utilised imputation credits received by the representative investor.

37. Lally observes that the utilisation rate is a market-level parameter, meaning that the same value applies to all firms.[704] Lally further considers that individual investors have differing utilisation rates; investors who are able to fully use tax credits are assigned a value of one whilst investors who cannot are assigned a value of zero. These individual utilisation rates are weighted to produce the required market-level utilisation rate *U*. Lally considers that the correct interpretation of *U* can be found in Lally and van Zijl, in which it is shown that '*U* is a complex weighted average over

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702 As noted in paragraph 38, the utilisation rate is a complex weighted average of the individual's utilisation rates. If this is interpreted as the proportion of franking credits redeemed by the representative investor, it follows that $UxIC_1$ is the total benefit the representative investors receives from imputation credits.

703 Given the role of cash flows in providing returns, the argument in this sentence also applies to the present value of equity.

704 M.Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 11.

all investors holding risky assets, where the weights involve each investor's investment in risky assets and their risk aversion'.[705,706]

38. This interpretation of the utilisation rate contrasts with the market value interpretation.[707] Formally, the above required value of *U* satisfies the following equation:

$$U = \sum_{i=1}^{n} w_i \times u_i \qquad \text{and} \qquad \sum_{i=1}^{n} w_i = 1 \qquad (8)$$

where:

w_i is investor i's weight, representing 'the complex weighted average over all investors holding risky assets, where the weights involve each investor's investment in risky assets and their risk aversion'.708

u_i is investor i's utilisation rate, where investors who are able to fully use tax credits are assigned a value of one whilst investors who cannot are assigned a value of zero.

39. Lally develops five different approaches for estimating the utilisation rate:[709]

- the first excludes foreigners from the domestic capital market, and draws on theoretical considerations to conclude that the appropriate rate is one;
- the second allows the presence of foreigners, and leads to an estimate of 'around 0.7' (the equity ownership approach);
- the third uses the proportion of credits that are redeemed with the Australian Tax Office by all investors (the tax statistics approach), giving an estimate of 0.4 to 0.8;
- the fourth is to use market prices, from cum and ex-dividend share prices, simultaneous share and futures prices, simultaneous share index and futures prices, and regressions of returns on imputation credit yields, giving an average across all approaches, excluding implausible results, of 0.39;
- the fifth is to draw on the surveys of market practitioners, yielding a trend to explicit recognition of credits, and a value of 0.75 among those that do.

40. The detail of these approaches are discussed in more detail in the next section, and in the subsequent material that follows.

41. In summarising his advice to the AER, Lally notes that his preference for the utilisation rate is one. Lally notes that in its draft determination, the AER determined a utilisation rate of 0.7,[710] Lally states his opinion that:[711]

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705 Ibid.

706 M. Lally. and T. van Zijl, 'Capital Gains Tax and the Capital Asset Pricing Model', *Accounting and Finance,* vol.43, 2003, pp. 187-210.

707 M. Lally. and , T. van Zijl, 'Capital Gains Tax and the Capital Asset Pricing Model', *Accounting and Finance,* vol.43, 2003, pp. 187-210.

708 Ibid.

709 M.Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 3.

710 The Authority notes the AER, in their final guidelines also determined a utilisation rate of 0.7, see: Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines*, December 2013, p. 159.

711 M. Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 48.

> However, I think that the AER should also have given consideration to defining U to exclude foreign investors, consistent with the Officer CAPM. Accordingly the only holders of Australian equities would be Australian residents. Since U is a value-weighted average over the utilisation rates of individual investors and all Australian residents (including individuals, superannuation funds, and tax-exempt entities) are able to fully utilise these credits, by offset against other tax obligations or by a tax refund, and therefore have utilisation rates of 1, then U would be 1.

42. Lally continues by noting that if the utilisation rate of 1 is rejected, his next preference is for an utilisation rate of 0.7 based on the equity ownership approach. If this possibility is rejected, his next preference is for the utilisation to be determined by the observation of franking credits redeemed, which he concludes falls in a range of 0.4 to 0.8 and suggests a midpoint of 0.6. If this is also rejected, Lally's fourth preference is to use the implied utilisation rate from market price studies, and suggests an average of 0.39. Lally's last preference is to use the evidence of market practitioners, but notes that this ranges from 0 to 0.75 which as a consequence does not produce a reliable point estimate. Lally concludes by noting that, in his view:[712]

> …the most important requirements in selecting a methodology for estimating U are that the estimate be consistent with the definition of U, as a value-weighted average over the utilisation rates of all investors who are relevant to the Officer CAPM, that the parameter estimate is likely to give rise to an estimated cost of equity from the Officer model that lies within the bounds arising from either complete segmentation or complete integration of equity markets, and that the estimate is reasonably precise.

AER's rate of return guidelines estimate

43. The AER undertook an extensive re-evaluation of the approach to estimating gamma for its rate of return guidelines.

44. The AER considers that the approach to valuing imputation credits should fit within the Officer and Monkhouse framework, and therefore that:[713]

> The value of imputation credits is investors' expected reduction of effective company tax paid because of imputation credits. Specifically, this is the reduction of company tax measured before personal tax.

45. The AER defines the value of imputation credits consistent with the Lally and van Zijl interpretation (refer paragraph 37), with their value being a weighted average across investors in the *defined market*. This further implies that investors are weighted by the value of the shares they own, in addition to their risk aversion. The AER further observes that this interpretation implies that all investors in the defined market collectively set the price, as opposed to a 'marginal investor'.[714]

46. The AER outlines its *defined market* as the 'Australian domestic market that recognises the presence of foreign investors to the extent they invest in the Australian domestic market'.[715] The AER states that this definition sits in between

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712 Ibid, p. 49.

713 Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, www.aer.gov.au, December 2013, p. 161.

714 Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, www.aer.gov.au, December 2013, p. 161.

715 Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, www.aer.gov.au, December 2013, p. 161.

the theoretical definitions of a fully segmented and a fully integrated capital market, which it considers to reflect the true Australian capital market. The Authority notes that this interpretation disagrees with Lally's advice, and this is discussed further below.[716]

47. The AER considers that the required estimation of gamma must be a market-wide estimate which applies to both of the sub-components, the payout ratio and utilisation rate. The AER noted that this market-wide interpretation for the utilisation rate is consistent with the Officer framework, and reduces estimation difficulties that would arise if a firm-specific or industry-wide utilisation rate was required.[717]

48. With respect to the payout ratio, the AER relied on Lally's advice who observed that the Officer framework implies a firm level estimate of the payout ratio is appropriate.[718] However as a practical matter, and to prevent regulatory gaming,[719] a market-wide ratio is appropriate.

49. The AER adopted an estimate of gamma of 0.5.

Estimate of the payout ratio

50. With respect to the distribution ratio, the AER adopted a value of 0.7 based on NERA evidence regarding the cumulative payout ratio, based on taxation statistics. This estimate is consistent with the ACT's decision regarding the payout ratio.

Estimate of theta

51. The AER determines that the most appropriate utilisation rate is 0.7, based on a range of methodologies outlined by Lally:[720]

- the equity ownership approach – gives an estimated range of 0.7 to 0.8 for U, and is given primary weight, as the AER considers it consistent with the conceptual framework of Officer and Monkhouse;
- tax statistics studies – which suggest a value for U of 0.4 to 0.8, and which is given some regard, despite acknowledged problems with data quality and consistency;
- implied market value studies – for a range of 0 to 0.5, is given less regard, as the AER considers it is not consistent with the conceptual framework of Officer and Monkhouse, and is complex and difficult to estimate; and
- the conceptual goal posts approach – for a range for U of 0.8 to 1.0, which provide boundaries for the estimation of U, although the AER does not consider this an empirical approach; and

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716 M.Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 14.

717 Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines*, www.aer.gov.au, December 2013, p. 164.

718 In particular, the correct payout ratio at the firm level would reflect the amount of profits paid out as dividends.

719 Lally argues that if a firm specific payout ratio is adopted, regulated firms would have an incentive to reduce their payout ratio in order to manipulate its regulated rate of return.

720 Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines*, www.aer.gov.au, December 2013, p. 159.

- other supporting evidence, including observations about market practice, government tax policy, and imputation equity funds.

The QCA's estimate

52. The QCA in its recent cost of capital determination adopted a value for gamma of 0.47, being the product of an estimated distribution rate of 0.84, and an estimated utilisation rate of 0.56.[721]

53. For the distribution rate of 0.84, the QCA relied on Lally's analysis of financial report data from the top 20 firms in the ASX 200 (see above). The QCA prefers Lally's estimates, as it considers it is robust and of high quality. QCA notes the estimation issues apparent in the ATO data, and also observes that the ATO estimates include listed and unlisted companies, whereas other CAPM estimates are estimated relative to listed companies only.[722]

54. For the utilisation rate, the QCA adopted an estimate of 0.56 based on updated estimates of the equity ownership shares of Australian listed companies. The QCA considered various strands of work, including in relation to:[723]

- dividend drop off studies – noting that there are well documented methodological and econometric problems with these studies, and widespread concern as to their reliability and interpretation, therefore giving low weight to these estimates;
- tax statistics estimates – citing relevant studies by Hathaway and Handley and Maheswaran for the post 2000 period, which give an average value of around 0.53;
- equity ownership approach – using an estimate of 44 per cent as the foreign ownership share of listed equities and assuming a utilisation rate of one for domestic resident investors, implying an average utilisation rate of 0.56;
- conceptual goal posts approach – noting that Lally's estimate using a fully segmented domestic CAPM and a fully integrated CAPM (the latter using the Solnik model) is of some relevance, but also that there is some uncertainty as to the bounds;
- other supporting evidence – citing a KPMG study from 2013 which identified most practitioners explicitly adjust for imputation credits when valuing infrastructure, at a rate that averaged 75 per cent.

Estimating gamma – Authority analysis

55. The estimation of gamma needs to account for both the theoretical underpinnings and the best means to empirically estimate the required parameters.

56. The Authority remains of the view that gamma may be estimated as the product of the distribution rate and utilisation rate, as set out in equation 3. This approach is

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721 Queensland Competition Authority, *Final Decision: cost of capital: market parameters*, August 2014, p. 28.

722 Queensland Competition Authority, *Final Decision: cost of capital: market parameters*, August 2014, p. 26.

723 Queensland Competition Authority, *Final Decision: cost of capital: market parameters*, August 2014, p. 27.

consistent with the accepted methodology set out by Officer and Monkhouse, as discussed above.

Distribution rate

57. In its recent decisions, the Authority has adopted a distribution rate of 0.7, from within the range of 0.7 to 1. This was the rate accepted by the ACT in its 2011 decision on the gamma. This estimate was retained for the Rate of Return Guidelines, as the Authority considered that there was no new evidence to depart from this finding.[724]

58. The 0.7 rate was based on ATO data showing around 70 per cent of total imputation credits created had been distributed. This ATO data covers both listed and unlisted companies.

59. More recent ATO data evaluated by NERA continues to provide support this estimate:[725]

- the cumulative distribution ratio from 1996 up to 2010-11, drawn from tax statistics is 0.69, similar to earlier estimates based on this method;
- the average distribution rate over the last five years, constructed from net tax and the change in the franking account balance is 0.70; and
- the average distribution rate over the last five years, constructed from net tax and franked dividends distributed is 0.53.

60. NERA considers that the cumulative distribution ratio is the most reliable number, but is likely to be an upwardly biased estimate due to under-reporting by companies of franking account balances and the treatment of firms who go bankrupt.[726] NERA also observes that there is no ready explanation for the substantial gap between the other two measures. This raises concerns as to the utility of the ATO estimates.

61. These estimates are market averages. It is accepted regulatory practice to adopt a market average, as this avoids regulatory gaming at the firm level, and sample issues at the industry level.

62. The Authority notes Lally's estimate of 0.84, which has been adopted by the QCA. This estimate is based on financial reports of the top 20 ASX 200 listed entities, covering 62 per cent of the ASX 200 market capitalisation. The Authority agrees with the QCA that this estimate well founded, and that the estimate is potentially superior to the other studies, particularly those that are based on data prior to changes to the imputation system in 2000.

Utilisation rate

63. The Authority considers the evidence for the utilisation rate in what follows.

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724 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* www.erawa.com.au, 16 December 2013, p. 212.

725 NERA, *The payout ratio*, Report for the Energy Networks Association, June 2013.

726 NERA, *The payout ratio*, Report for the Energy Networks Association, June 2013, p. 11.

Equity Ownership Approach

64. The equity ownership approach for estimating the utilisation rate relies on the estimated proportion of Australian shares owned by Australian residents who are eligible to utilise imputation credits. Eligible Australian investors use franking credits to offset their personal taxation by the amount of company taxation prepaid, and their utilisation rate is one. Given international investors cannot utilise franking credits, their utilisation rate is zero. It follows that an estimate of the utilisation rate can be calculated by analysing the proportion of Australian equity held by Australian investors.

65. However, the Authority notes that this approach does not reflect the risk aversion present within the complex weighted average in the Lally et al definition.[727]

66. Formally, the equity ownership approach produces an estimate of the required utilisation rate in equation (3) by observing the total proportion of Australian equity held by Australian residents. This estimate can be represented as follows:

$$\hat{U} = \sum_{i=1}^{n} v_i \times u_i \qquad \text{and} \qquad \sum_{i=1}^{n} v_i = 1 \tag{9}$$

where:

$\hat{U}$ is the estimated utilisation rate;

v_i is the proportion, weighted by value, of Australian equity owned by the ith investor;

u_i is the utilisation rate of the ith investor; with $u_i = 1$ for domestic investors and $u_i = 0$ for international investors.

67. Using this approach, the AER estimates the utilisation rate to be between 0.7 and 0.8.[728] The AER estimate is based on 2007 evidence provided by the Australian Bureau of Statistics (**ABS**), which showed that 71 per cent of Australian equity is held by domestic investors.[729] Additional evidence was sourced from Hathaway in September 2013, which provides evidence that over the past 24 years, Australian equity is held by domestic investors at a proportion between 75 and 81 per cent.[730] The AER notes some discrepancies between the two studies, even though Hathaway's more recent data is based on the ABS data. Accordingly, the AER adopted the range encompassing both estimates (that is, 70 to 80 per cent).

68. The AER notes that under the Officer framework, the weightings for the representative investor should reflect both:

- the value weighting of each investor; and

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727 M. Lally, and T. van Zijl, 'Capital Gains Tax and the Capital Asset Pricing Model', *Accounting and Finance,* vol.43, 2003, pp. 187-210.

728 Ibid.

729 Australian Bureau of Statistics, *Feature article: Foreign ownership of equity,* Available at: http://www.abs.gov.au/ausstats/abs@.nsf/featurearticlesbytitle/EDEB646A92BF2BFBCA2579B8000DF20B?OpenDocument

730 N. Hathaway, Imputation Credit Redemption ATO data 1988-2011, Where have all the credits gone? September 2013, pp. 16-21.

- the risk aversion of each investor, defined as the expected return of each investor's portfolio divided by their expectations of variance in that portfolio.[731]

69. The AER notes that a drawback of the equity ownership approach is that it does not take into account the risk aversion of each investor. Comparing equation (9) to equation (8), this implies that the weights are not equivalent, that is $v_i \neq w_i$. The AER notes that it is impossible to estimate this factor accurately, and therefore the correct weights w_i are unobservable.[732] On balance, the AER considers the equity ownership approach is appropriate as it aligns with the interpretation of the gamma parameter, being an estimate over the entire trading year that does not suffer any methodological issues.

70. The Authority concurs with the AER that this approach suffers from the drawback that it does not correctly estimate the appropriate weighting, in that it does not reflect the risk aversion of each investor. However, as noted above, the direction of this imprecision is unquantifiable, therefore the Authority has no reason to believe this approach would lead to a biased estimate of the utilisation rate. That is, whilst the weights using this approach do not coincide with the required definition, there is currently no evidence to suggest that $v_i < w_i$ or $v_i > w_i$ systematically. The Authority therefore recognises that the equity ownership approach is applicable, given the empirical reality of the presence of foreign investors in the Australian domestic financial market.

71. In contrast to the AER, the QCA further update the ABS estimates and report that the estimates support a foreign ownership share (listed and unlisted) of around 30 per cent, depending on the period chosen.[733] This supports the value of equity ownership share of 0.7. The QCA then identifies that the foreign share of *listed* equities is 44 per cent, implying equity ownership of 56 per cent.[734]

72. Overall, the Authority considers that the foregoing evidence points to the equity share ownership approach supporting an estimate of *U* around 0.7 if all equity is considered, and 0.56 if only listed equity is considered.

Tax statistic estimates

73. The Authority determined in the Rate of Return Guidelines that tax statistics could not be used to estimate the required utilisation rate, given the ACT determination.[735] However, in light of the new advice and interpretation from Lally, the Authority has considered the previous position to be in error and has re-examined the appropriateness of using tax statistics to estimate the required utilisation rate.

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731 P. Monkhouse, 'The cost of equity under the Australian dividend imputation system', *Accounting and finance,* November 1993, vol. 33(2), p. 10.

732 Australian Energy Regulator, *Better Regulation Explanatory Statement for the Rate of Return Guidelines*, www.aer.gov.au, December 2013, p. 173.

733 Queensland Competition Authority, *Final Decision: cost of capital: market parameters*, August 2014, p. 98.

734 Ibid.

735 Economic Regulation Authority, Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, www.erawa.com.au, December 2013, p. 212.

74. In particular, the Authority concurs with the AER that the interpretation regarding the required gamma parameter was not correct at the time of the ACT determination. Therefore, the previous argument employed by the Authority in disregarding taxation statistics does not hold.[736] In particular, the argument used by the Authority – that investors incur costs to obtain franking credits – is irrelevant for the calculation of the utilisation rate, as this is not required under the Lally interpretation of the gamma parameter. That is, the required gamma parameter under the Officer framework refers only to the proportion of personal taxation reduced by corporate taxation paid, and need not reflect any costs incurred to obtain the imputation credits.

75. Tax statistics estimate the utilisation of imputation credits, which is a measure of the imputation credits redeemed by shareholders. This methodology uses Australian Taxation Office (**ATO**) statistics to observe the proportion of distributed imputation credits that have been used by investors to reduce their personal taxation liabilities. This approach implicitly assumes that the value of a redeemed franking credit is equal to its face value, whilst an unredeemed franking credit has no value. It follows that the average value of a franking credit is equal to the proportion of franking credits redeemed.[737]

76. Formally, the tax statistics approach produces an estimate of the required utilisation rate in equation (8) by observing the total amount of franking credits redeemed by Australian residents. An investor who redeems a franking credit by definition has a utilisation rate of 1, whilst an unredeemed credit has a utilisation rate of 0. The estimate can then be stated as follows:

$$\hat{U} = \sum_{i=1}^{n} r_i \times u_i \qquad \text{and} \qquad \sum_{i=1}^{n} r_i = 1 \tag{10}$$

where:

$\hat{U}$ is the estimated utilisation rate;

r_i is the proportion of franking credits redeemed by the ith investor as a percentage of the total number of franking credits;

u_i is the utilisation rate of the ith investor; with $u_i = 1$ for domestic investors and $u_i = 0$ for international investors.

77. The Authority noted in the Rate of Return Guidelines that two studies – performed by Hathaway and Officer (2004) and Handley and Maheswaran (2008) – have been considered by regulators in the past to estimate the required utilisation rate.[738]

78. Hathaway and Officer (2004) examined national tax statistics in order to estimate the average value of redeemed imputation credits from 1988 to 2002.[739] They calculated that 71 per cent of company tax payments had been distributed as imputation credits on average and estimated that 40 to 50 per cent of the distributed

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[736] Ibid.

[737] NERA Economic Consulting, *The Value of Imputation Credits*, A report for the ENA, Grid Australia and APIA, 11 September 2008, p. 23.

[738] Economic Regulation Authority, Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, 16 December 2013, p. 212.

[739] N.J. Hathaway & R.R. Officer, *The Value of Imputation Tax Credits,* working paper, Melbourne Business School, 2004, p. 14.

credits were redeemed by taxable investors. Taking these two factors into account indicated to the authors that the statutory company tax rate is reduced by a proportion of 28 to 36 per cent. This suggested that the effective rate of company taxation is around 19 to 21 per cent. They estimated a value of gamma within a range of 0.38 to 0.44. However, they noted that some of their data is not reliable.[740]

79. Handley and Maheswaran (2008)[741] examined the reduction in individual tax liabilities due to imputation credits from 1988 to 2004. Their study found that 67 per cent of distributed imputation credits were used to reduce personal taxes between 1990 and 2000, and this increased to 81 per cent over 2001-2004.

80. In his advice to the AER, Lally observed that SFG Consulting has previously argued that taxation statistics can only provide an upper bound on *U*, as opposed to a point estimate of *U*.[742,743] This argument was also previously accepted by the Authority as a consequence of the ACT decision.[744] Lally notes that as people who receive franking credits utilise them fully, this is incorrect and redemption rates can be used to provide a point estimate of *U*. Lally demonstrates this by defining u_i as the utilisation rate of investor i, and t_i denote their marginal taxation rate. Lally notes that the personal tax obligation of that investor due to dividends paid, after the taxes already paid by the company is as follows:

$$Tax_i = (DIV + u_i IC)t_i - u_i IC \qquad (11)$$

81. Lally notes that Australian investors can be assigned to two groups, those who can and cannot utilise franking credits. Given that the taxation for those who can utilise franking credits is as follows:

$$Tax_i = (DIV + IC)t_i - IC \qquad (12)$$

It follows that $u_i = 1$ for these investors.

82. Lally notes that therefore, as the utilisation rate is not less than 1 for these investors, taxation statistics can provide an accurate point estimate of *U*. Implicit in this analysis is the assumption that franking credits cannot be transferred between investors. Lally continues by observing the evidence presented by McKenzie and Partington, which indicates that even though legislation exists to prevent this, it can be overcome in some cases.[745] Lally further notes that if this practice is extensive, it may result in tax statistics overestimating the utilisation rate. The Authority considers that as the legislation to transfer the credits exists to prevent this, it is

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740 NJ Hathaway & RR Officer, *The Value of Imputation Tax Credits,* working paper, Melbourne Business School, 2004, p. 14.

741 J. Handley. and K. Maheswaran, "A Measure of the Efficacy of the Australian Imputation Tax System", *The Economic Record*, Vol. 84, No. 264, 2008, pp. 82-94.

742 SFG Consulting, *Estimating Gamma,* Report prepared for QR National, 2012, p. 7.

743 M. Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 18.

744 Economic Regulation Authority, Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, 16 December 2013, p. 212.

745 M. McKenzie, and G. Partington, *Evidence and Submissions on Gamma,* report prepared for the AER, 2010.

likely to considerably constrain this activity and as a consequence this is not considered a significant issue.

83. The Authority notes that Hathaway has observed that large discrepancies exist in relation to franking credits when comparing ATO taxation data to that of ATO company financial data.[746] Hathaway urges caution in using ATO statistics for any estimates of parameters concerned with franking credits, until a reconciliation related to the actions of state owned enterprises is conducted, which may provide an explanation.

84. Both the AER, and Lally observe that using taxation statistics may be inconsistent with the interpretation of gamma under the Officer framework, where the utilisation rate is required to satisfy the complex weighted average outlined in equation (8).[747] Taxation statistics produce an estimate of the utilisation rate that are weighted by the amount of imputation credits received, not by equity ownership or risk aversion. On balance, the AER noted that it considers taxation statistics have merit in informing the required utilisation rate, but given these criticisms, it does not propose relying solely on this in informing its judgement. The AER notes that the range of evidence reported above points to a utilisation rate in the range of 0.4 to 0.8. The Authority agrees with these conclusions.

85. As a consequence of the reinterpretation of the gamma parameter, the Authority now considers taxation statistics can be used to *empirically* estimate the utilisation rate. However, given the concerns of Hathaway, Lally and the AER, the Authority does not consider that this methodology can be given much weight in determining the required utilisation rate, *U*. In particular, the Authority considers the equity ownership approach outlined above provides a superior empirical estimate of the required utilisation rate *U* relative to the taxation statistics method. This is a consequence of the equity ownership approach reflecting equity ownership, whilst taxation statistics only reflect credits redeemed.

Implied Market Value

Dividend Drop-Off Studies

86. Dividend drop-off studies examine how share prices change on ex-dividend days after distribution of both cash dividends and attached franking credits. The amount by which the share prices change (on average) is assumed to reflect the value investors place on the cash dividend and imputation credit as separate from the value of the shares. Econometrics can then be used to distinguish the component of the price drop off due solely to the value of the franking credits. By performing this analysis over a long period of time and across a large number of dividend events, an average market valuation of franking credits can be obtained.

87. The Authority previously relied solely on the evidence from dividend drop off studies to estimate the required utilisation rate as a consequence of the ACT

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[746] N.Hathaway, Imputation credit redemption ATO data 1988-2011, Where have all the credits gone?, September 2013, p. 5.

[747] Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, www.aer.gov.au, December 2013, p. 175.

determination.[748] As discussed above, this was the basis for adopting a utilisation rate of 0.35 to 0.55 in the Rate of Return Guidelines.[749] The Authority noted, however, that dividend drop off studies suffer from a variety of econometric estimation issues that result in the estimated value of theta being vulnerable to the dividend sample, parametric form of the regression equation and regression technique used.[750] The Authority was of the view that the best way to mitigate these effects was to rely on more than one dividend drop off study in order to inform the correct utilisation rate.[751] At the time, the Authority noted that only two dividend drop off-studies were relevant – the SFG estimate[752] and that arising from its own analysis.[753] This was the only evidence considered relevant to inform the required utilisation rate at the time of formulating the Rate of Return Guidelines.[754]

88. The Authority has changed its view in light of the interpretation of the gamma parameter provided by Lally and additional material highlighted by the AER and the QCA.[755] In particular, the Authority notes that both Lally and the AER consider that dividend drop off studies do not correctly estimate the utilisation rate required under the Officer framework.[756] The AER provides the following criticisms of dividend drop off studies not previously considered by the Authority:

89. The required utilisation rate under the Officer framework is a complex weighted average determined by the value of equity that investor's hold and their relative risk aversion. Dividend drop off studies, however, only reflect the value weighted utilisation rate around just two days, the cum-dividend and ex-dividend dates. As a consequence, they measure the 'utilisation rate'[757] with a value weighting that reflects the composition of investors around the cum and ex-dividend dates, not the correct weighted average across the entire market over an entire year, as required.

90. A key assumption of the Officer CAPM framework employed by Australian regulators is that it assumes a segmented domestic capital market in addition to tax invariance between capital gains and dividends. Dstudies, however, reflect the empirical reality of foreign investors and differential taxation rates between capital gains and dividends. Therefore, any estimate of the utilisation rate using the dividend drop off

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748 Australian Competition Tribunal, Application by Energex Limited (No 2) [2010] ACompT7, October 2010.

749 Economic Regulation Authority, Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, December 2013, p. 208.

750 D. Vo, B. Gellard, S. Mero. 'Estimating the Market Value of Franking Credits, Empirical Evidence from Australia' Conference Paper, Australian Conference of Economists 2013.

751 Economic Regulation Authority, Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, December 2013, p. 208.

752 SFG Consulting 2011, *Dividend drop-off estimate of theta*, Final Report, 21 March.

753 D. Vo, B. Gellard, S. Mero. 'Estimating the Market Value of Franking Credits, Empirical Evidence from Australia' Conference Paper, Australian Conference of Economists 2013.

754 Economic Regulation Authority, Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, December 2013, p. 208.

755 Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, December 2013, p. 173.

756 M. Lally, '*The Estimation of Gamma,* Report for the AER', School of Economics and Finance, Victoria University of Wellington, Nov 2013, p. 20.

757 Lally notes that the utilisation rate derived from dividend drop off studies has been consistently misinterpreted, this is discussed below.

method is incompatible with the Officer CAPM framework and by extension the NGR.

91. The required estimate of the utilisation rate is defined relative to a representative investor's ability to use each franking credit to reduce personal tax. However, as trading around the ex-dividend date represents a variety of different incentives[758], it does not accurately reflect the taxation incentive.

92. The AER and Lally also highlight the econometric problems that exist with dividend drop off studies. This issue has been well explored by the Authority,[759] which has previously noted that this is the reason for the large divergence in empirical estimates of the utilisation rate using dividend drop off studies.[760] The Authority noted that any estimate of theta is essentially a function of the most influential observations, due to the extreme multicollinearity present in the data. This conclusion is supported by the AER, who notes:[761]

> Further, even if implied market value estimates were conceptually appropriate, there are significant limitations with the accuracy and robustness of such studies.

93. Lally further notes:[762]

> The AER does not consider that these estimates are useful for a number of reasons. In respect of dividend drop off studies, these include evidence that trading activity around dividend ex-days is abnormal, that correction is required for market movements, and the sensitivity of results to data, outliers and model choices. More generally these problems include the difficulties in separating the values of franking credits and dividends in these studies, the wide range of empirical results from such studies, the possibility of bias from 'bid-ask bound', and the exposure of such estimates to the tax circumstance and transaction costs of tax arbitrageurs. Many of these problems are manifest in high standard errors in the estimates of the coefficients. I concur with all of these concerns, and I have additional concerns about these studies or their interpretation.

94. Lally also provides evidence that Australian regulators (including the Authority) and the ACT have consistently misinterpreted the results of dividend drop off studies for estimating the required utilisation rate. Lally observes that the coefficient of the regression equation in dividend drop off studies is generally assumed to be the utilisation rate, which Lally suggests is incorrect. Lally demonstrates this by first outlining the dividend drop of equation as follows:

$$P_{i,t-1} - P^*_{i,t} = \delta D_i + \theta FC_i + u_i \qquad (13)$$

where:

$P_{i,t-1}$ is the cum-dividend price;

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758 Such as transaction costs, tax situation and trading strategy.

759 D. Vo, B. Gellard, S. Mero. 'Estimating the Market Value of Franking Credits, Empirical Evidence from Australia' Conference Paper, Australian Conference of Economists 2013.

760 The Authority explored in the explanatory statement of the Rate of Return Guidelines the econometric issues encountered in dividend drop off studies, for a detailed discussion see: Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* Dec 2013, p.216 and Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines* Dec 2013, Appendix 28.

761 Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, Dec 2013, p. 177.

762 M. Lally, '*The Estimation of Gamma,* Report for the AER', November 2013, p. 20.

$P^*_{i,t}$ is the ex-dividend price corrected for the market movement;

D_i is the cash dividend;

FC_i is the franking credit;

u_i is the regression residual.

95. Lally begins by noting that no distinction should be made regarding the cash dividend and franking credit if the franking credit can be fully utilised, e.g. a cash dividend of $10 and a franking credit of $2 is equivalent to a cash dividend of $12. That is, an investor should be indifferent between the decomposition of any gross dividend[763] received to the extent the franking credit can be utilised. Lally further observes that if all investors can utilise imputation credits, the required regression equation would be as follows:

$$P_{i,t-1} - P^*_{i,t} = \delta[D_i + FC_i] + u_i \qquad (14)$$

96. In this circumstance, δ, recognises that the expected price change can differ from the paid out gross dividend,[764] as in reality, the tax rate applicable on the gross dividend can diverge from that of capital gains.[765] In order to incorporate the empirical reality of not all investors being able to utilise franking credits, Lally notes that the franking credit covariate should be multiplied by the coefficient *U*, to represent the average utilisation rate. The required equation is then as follows:

$$\begin{aligned} P_{i,t-1} - P^*_{i,t} &= \delta[D_i + U.FC_i] + u_i \\ &= \delta D_i + U.\delta.FC_i + u_i \end{aligned} \qquad (15)$$

97. Based on this analysis, it is apparent that $\theta = U.\delta$. Therefore, in order to derive the required utilisation rate, U, from dividend drop off studies, the estimated coefficient of the franking credit, θ, must be divided by the estimated coefficient of the cash dividend, δ, as follows, $U = \frac{\theta}{\delta}$.

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763 Gross dividend refers to the sum of the cash dividend and the franking credit, $G_i = D_i + FC_i$

764 The coefficient in equation (16), δ, is the gross drop-off ratio, see: Beggs D., and Skeels, C., 2006, 'Market Arbitrage of Cash Dividends and Franking Credits', *Australian Economic Papers,* vol 82, pp. 239 252. The estimated coefficient, $\hat{\delta}$, therefore measures the average change in stock price that occurs due to payment of $1 of gross dividend.

765 The Authority notes that the theoretical model underlying dividend drop off studies is based on Elton, E.J and Gruber, M.J (1970), 'Marginal Stock Holder Tax Rates and the Clientele Effect', *Review of Economics and Statistics,* 52, 68-74. Under the assumptions of no stochastic uncertainty, no time value of money and no transaction costs, it can be shown that $\delta = \frac{(1-T_d)}{(1-T_g)}$ where T_d is the tax rate applicable to the gross dividend, whilst T_g is the tax rate applicable on capital gains. It follows that $\hat{\delta}$ measures the divergence in tax rates applicable to the gross dividend and capital gains of the representative investor.

98. The Authority has accepted the criticism that it has misinterpreted the required utilisation rate in previous regulatory decisions, in addition to the Rate of Return Guidelines. Re-interpreting the required utilisation rate from the previously considered relevant dividend drop off studies results in a utilisation rate of 0.4 from the SFG analysis,[766] and a range of 0.40 – 0.63 from the Secretariat's analysis.[767]

99. Lally in his advice also explores the following issues with dividend drop off studies and the impact this has on the required estimate of the utilisation rate:

- Only studies that contain estimates using data from July 2000 are relevant, due to changes in the taxation system at this time;
- The wide variety of estimates of the utilisation rate using this methodology from different authors damage the credibility of this method; Lally further notes that this is due to the large standard errors arising from the econometric issues arising in dividend drop off studies;
- Lally further explores the interpretation of the utilisation parameter U with respect to dividend drop off studies and notes that any estimate using this method will reflect the motives of investors who trade at this time, and not the required value-weighted average of all investors in the market;
- Lally acknowledges the academic literature regarding the abnormal returns regarding stocks trading around cum and ex-dividend days. In particular, Lally cites Walker and Partington, who state that due to microstructure and the presence of tax arbitrage, there is 'the issue of whether use of the traditional drop-off ratio may lead researchers to make erroneous inferences'.768
- Lally also cites the Cannavan, Finn and Gray simultaneous price study, noting that the authors have similar concerns, when they state that for '…these reasons, it is unlikely that the traditional ex-dividend day drop-off methodology will be able to separately identify the value of cash dividends and imputation credits'.[769] Lally observes that this contradicts the SFG Consulting's dividend drop off result as an estimate of the utilisation rate.[770]

100. Lally also presents a criticism of SFG's report on estimating gamma which warrants consideration,[771] given that it examines issues regarding the correct interpretation of *U* in the Officer CAPM. SFG notes that the Officer CAPM assumes that unfranked cash dividends and capital gains are equally valued (that is, they are tax invariant), which is in conflict with the empirical reality of differential taxation between the two. To eliminate this inconsistency, SFG advocates restricting any estimate of the ratio of unfranked cash dividends and capital gains to equal 1. This would have the practical implication of restricting the cash dividend coefficient, δ, in equation (13)

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766 SFG Consulting 2011, Dividend drop-off estimate of theta, Final Report, 21 March.

767 D. Vo, B. Gellard, S. Mero. 'Estimating the Market Value of Franking Credits, Empirical Evidence from Australia' Conference Paper, Australian Conference of Economists 2013.

768 S. Walker and G. Partington., 'The Value of Dividends: Evidence from Cum-Dividend Trading in the Ex-Dividend Period', *Accounting and Finance,* vol.39, 1999, pp. 275-296.

769 D. Cannavan, F. Finn, and S. Gray, 'The Value of Imputation Tax Credits in Australia', *Journal of Financial Economics,* vol 73, 2004, pp. 167-197.

770 SFG Consulting 2014, *Estimating Gamma*, Report for ATCO Gas Australia, 13 March 2014.

771 SFG 2012, *Estimating Gamma,* report prepared for QR National (www.qca.org.au).

to be 1, and this would force the franking credit coefficient, and consequently the utilisation rate to equal 0.[772]

101. Lally disagrees with this, noting that this conflicts with the evidence presented by SFG of a utilisation rate of 0.4, and that it is internally inconsistent with its estimated value of the cash dividend of between 0.85 and 0.9. Finally, Lally considers that this approach conflicts with logical inference, in that a model should be chosen because it reflects the empirical evidence and that the assumption of equal taxation between cash dividends and capital gains is wrong. Lally also observes that not all dividend drop off studies estimate a drop off ratio of 1, noting the results of Beggs and Skeels[773] and Brown and Clarke[774], which estimate the drop off ratio with a range from 0.93 to 1.17. Lally further notes that examination of non-imputation regimes (such as Australia pre-imputation and overseas markets) indicate that the cash dividend coefficient is also less than one, indicating that SFG's assumption of fully valued cash dividends is flawed.

102. Lally presents the view that using dividend drop off studies to estimate the required *U* is irrelevant, as due to the many methodological problems, they should not be given much weight. Lally notes that the empirical reality of differential taxation should result in the rejection of the Officer CAPM in regulatory practice, and suggests other CAPM's such as Lally (1992),[775] Cliffe and Marsden (1992),[776] or Lally and van Zijl (2003).[777] Lally then notes that '…however, until this point is reached, it would not be sensible to choose an estimate of *U* merely to paper over the empirical challenges to the Officer CAPM'.[778]

103. The Authority considers that market value statistics have little value in informing the required utilisation rate. This is primarily a consequence of the above criticism of Lally and the AER, in addition to the previous econometric criticisms outlined in the Rate of Return Guidelines.[779]

104. In addition, the Authority has previously recognised that as dividend drop off studies are a market based measure, they incorporate the costs investors incur to obtain franking credits.[780] This contradicts the required interpretation of the utilisation rate under the Officer CAPM framework, which requires a complex weighted average of

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[772] This implication also follows from the observation that dividend drop off studies estimate a gross drop-off of approximately 1, see: SFG Consulting 2011, Dividend drop-off estimate of theta, Final Report, 21 March and Vo, D., Gellard, B., Mero, S. (2013) 'Estimating *the Market Value of Franking Credits, Empirical Evidence from Australia' Conference Paper*, Australian Conference of Economists 2013.

[773] Beggs D., and Skeels, C., 2006, 'Market Arbitrage of Cash Dividends and Franking Credits', *Australian Economic Papers,* vol 82, pp. 239-252.

[774] Brown, P., and Clarke, A. 1993, 'The Ex-Dividend Day Behaviour of Australian Share Prices Before and After Dividend Imputation', *Australian Journal of Management,* vol.18, pp.1-40.

[775] Lally,M., 1992, 'The CAPM under Dividend Imputation', *Pacific Accounting Review,* vol.4, pp. 31-44.

[776] Cliffe, C. and Marsden, A. 1992, 'The Effect of Dividend Imputation on Company Financing Decisions and the Cost of Capital in New Zealand', *Pacific Accounting Review,* vol.4, pp. 1-30.

[777] Lally, M. and van Zijl,T., 2003, 'Capital Gains Tax and the Capital Asset Pricing Model', *Accounting and Finance,* vol.43, pp. 187-210.

[778] M. Lally, *The Estimation of Gamma,* Report for the AER', November 2013, p. 32.

[779] Economic Regulation Authority, Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, 16 December 2013.

[780] These costs include transaction costs, risk, the lack of international diversification opportunities for domestic investors and international investors inability to utilise franking credits.

individual's utilisation rates[781], as in equation (6). As a consequence of this interpretation regarding the required utilisation rate *U*, the Authority considers these costs are not necessary, and any estimate that incorporates them will necessarily underestimate the required utilisation rate *U* in the Officer CAPM.

105. The Authority now considers that dividend drop off studies are only useful to the extent that they confirm that investors place value on franking credits, however, due to the econometric issues associated with them, their exact market value cannot precisely be determined. Given that this market value is irrelevant to the required utilisation rate, the Authority has disregarded them for informing the required utilisation rate. The Authority notes this is a significant departure from the view held in the Rate of Return Guidelines, with dividend drop off studies being the sole evidence to inform the required utilisation rate.[782]

Simultaneous Price Studies

106. The simultaneous price methodology infers a value for franking credits (and a corresponding value for cash dividends) by observing prices of shares in a company (which entitle the holder to dividends and the associated franking credits) and derivatives contracts on the same stock (which involve no such entitlement). The difference in the prices of the stock and the implied price of the stock from the derivatives contract provides an estimate of the value of the dividend and the associated franking credit.

107. The AER surveyed a range of alternative market value studies:[783]

- futures studies provide estimates in the range from 0.12 to 0.53 based on more recent studies;
- equity returns studies provide confounding results, with some suggesting negative rates, which is implausible;
- simultaneous share trades provide estimates in the range 0.68 to 1, but all the results are based circumstances prior to 2000.

Views of market participants

108. The AER also considers auxiliary evidence regarding the view of market participants, in particular:[784]

- Surveys of ASX listed companies;[785]
- Surveys of institutions (such as investment banks);[786]

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781 As before, investors who can utilise franking credits have an utilisation rate of 1, whilst investors who cannot have an utilisation rate of 0.

782 Economic Regulation Authority, Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules, www.erawa.com.au, December 2013, p. 216.

783 Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, www.aer.gov.au, December 2013, p. 173.

784 Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, www.aer.gov.au, December 2013, p. 182.

785 Troung, Partington and Peat, 'Cost-of-capital estimation and capital-budgeting practice in Australia', *Australian Journal of Management,* June 2008, vol.33 (1), pp. 95-121.

786 KPMG, Corporate finance: Valuation practices survey, April 2013.

- Independent expert reports lodged with the ASX;[787]
- Other evidence such as the existence of equity imputation managed funds[788] and the government legislation designed to prevent dividend washing.[789]

109. The AER concludes from examining the evidence that imputation credits have significant value to investors, but notes that this evidence cannot be used to estimate the correct utilisation rate.[790] The Authority agrees that the above evidence is not directly relevant to the estimation of the required utilisation rate under the NGR. However, it does confirm that franking credits have value to investors.

Conceptual Goal Posts Approach

110. Lally considers that the assumed presence of foreign investors in the regulatory definition of the market portfolio is incompatible with the assumptions of the Officer CAPM, because the latter assumes a fully segmented domestic capital market.[791] Lally is of the view that while the ideal model will reflect all possible empirical contingencies, in practice this is often impossible. However, any model based on unrealistic assumptions will by definition contain an error.

111. Importantly, Lally observes that this conceptual conflict can manifest itself through a perverse impact on the estimated cost of equity. He demonstrates this by noting that as equity markets have continued to globalise and become more integrated, foreign ownership of Australian equity will tend to increase, which will by definition decrease any *empirical* estimate of the required utilisation rate *U.*

112. Lally demonstrates that where the empirically estimated value of *U* is used in the Officer CAPM, it will tend to result in an *increase* in the cost of equity estimate, while in reality the cost of equity should fall as a consequence of a more integrated equity market.[792] Lally considers that this failure of the model arises directly as a consequence of the incompatibility between the assumptions of perfect segmentation in conjunction with an empirical estimate of the utilisation rate *U* based on the presence of foreign investors in the domestic capital market. Lally notes that:[793]

> In this event the partial recognition of foreign investors would effectively constitute cherry-picking that maximises the revenue or price cap, i.e. ignoring foreign investors when it is favourable to regulated firms (choosing the CAPM) and also estimating U by a methodology that reflects the presence of these investors when it is also favourable to regulated firms.

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787 The AER source the following submission to their guidelines: SFG, Evidence on the required return on equity from independent expert reports: Report for the Energy Networks Association, 24 June 2013.

788 Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, www.aer.gov.au, December 2013, p. 182.

789 Ibid.

790 Ibid.

791 M. Lally, *The Estimation of Gamma,* Report for the AER, 23 November 2013, p. 14.

792 This occurs due to investors being able to diversify risk more effectively, resulting in a reduction in any risk premium.

793 M. Lally, '*The Estimation of Gamma,* Report for the AER', School of Economics and Finance, Victoria University of Wellington, Nov 2013, p. 38.

113. Lally's analysis may be summarised as follows.[794] First, Lally utilises the Officer CAPM to estimate the return on equity under the assumption of a fully segmented domestic capital market, with various outcomes depending on an assumed range for the utilisation rate.

114. Lally then turns to the case of completely integrated capital markets, and proceeds to estimate a return on equity using the Solnik CAPM.[795] Lally notes that this international CAPM has close parallels to the Officer CAPM. As the definition of the market portfolio differs between the two models – the Officer model being a segmented and the Solnik model being integrated – both the market risk premiums and equity beta necessarily are different in the two models.

115. Lally proceeds with a detailed numerical analysis of the cost of equity capital under each model. Lally shows that using the fully segmented Officer CAPM, with a utilisation rate of one, consistently produces an estimate of the return on equity that exceeds that of complete integration (as estimated with the Solnik model).

116. Importantly, Lally demonstrates that adopting a utilisation rate of less than one in the Officer CAPM, while not adjusting other parameters in the model to account for the presence of foreign investment, can result in an estimate of the return on equity that exceeds the full segmented Officer CAPM.

117. The corollary is that the model parameters need to change to reflect the presence of foreign investors:[796]

> …as one moves from a world of complete segmentation to complete integration, the model used should also change and this is not done. Instead regulators are using a model that presumes complete segmentation and populating it with an estimate for U that reflects partial segmentation. The result is regulatory estimates of the cost of equity that lie outside the bounds of complete segmentation and complete integration. Given the use of the Officer model by regulators, and an MRP estimate that can reasonably be presumed to lie between the two extreme cases, the only values for U that produce sensible estimates for the cost of equity are those from 0.80 to 1.

118. In this context, the Authority notes that the lower bound of Lally's estimated range for *U* depends on the assumptions for the Solnik model. The estimate of what is 'sensible' also depends on the assumptions used for the regulator's estimate of the partially segmented domestic MRP.

119. It is possible that varying these assumptions would broaden the permissible range of what is potentially 'sensible'. Lally conducts sensitivity analyses, demonstrating that some combinations of the parameters provide sensible estimates for a value for *U* as low as 0.625.[797]

120. Second, the Authority also notes that it no longer is relying on the long run historic market risk premium (**MRP**) estimate of 6 per cent – its model *has changed* as Lally notes is required. The most commonly observed value for the MRP estimate based

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[794] Ibid.

[795] Solnik, B. 1974, 'An Equilibrium Model of the International Capital Market', *Journal of Economic Theory,* vol.8, pp. 500-24.

[796] M. Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 44.

[797] M. Lally, *The Estimation of Gamma,* Report for the AER, November 2013, Table 3, p. 45.

on the method set out in the Rate of Return Guidelines, and used for this decision, is expected to be 5.5 per cent (see paragraph 733 in the 'Rate of Return' section). This estimate is consistent with the more recently observed (grossed up) MRP since the introduction of imputation credits. Use of this estimate in Lally's analysis would further reduce the permissible lower bound range for *U*, to as low as 0.6.

121. Accordingly, the Authority considers that it is reasonable to infer a range for θ of 0.6 to 1, as conceptual goal posts. The Authority recognises that there is uncertainty as to the exact lower bound, and that values approaching 0.6 require combinations of less likely parameter values. The AER reaches similar conclusions.[798]

[798] Australian Energy Regulator, Better Regulation Explanatory Statement for the Rate of Return Guidelines, December 2013, p. 181.

Appendix 9 Public Reference Tariff Model