Final decision

Envestra Ltd

Access arrangement proposal for the Qld gas network

1 July 2011 – 30 June 2016

June 2011

AUSTRALIAN ENERGY REGULATOR

Contents

Final decision

In accordance with r. 62 of the National Gas Rules (NGR), the Australian Energy Regulator (AER) refuses to approve the revised access arrangement proposal submitted by Envestra Ltd (Envestra) for its Qld gas distribution network. The final decision sets out the AER's consideration of the revised access arrangement proposal and the revisions it proposes to the revised access arrangement proposal and revised access arrangement information. The AER has formulated the revisions with regard to the matters set out in r. 64(2) of the NGR.

AER's proposed revisions

The AER proposes revisions to the revised access arrangement proposal and revised access arrangement information as set out in this final decision. The AER has formulated its proposed revisions with regard to the criteria set out in r. 64(2) of the NGR.

The AER must make a decision giving effect to its proposed revisions within two months of making this final decision. The AER expects to publish its access arrangement and access arrangement information for Envestra's Qld gas distribution network by 30 June 2011.

Shortened forms

Shortened form	Extended form
access arrangement information	Envestra, *Queensland access arrangement information*, 1 October 2010
access arrangement period	1 July 2011 to 30 June 2016
access arrangement proposal	Envestra, *Access arrangement for the Queensland gas distribution system*, 1 October 2010
AER	Australian Energy Regulator
Capex	capital expenditure
Code	National Third Party Access Code for Natural Gas Pipeline Systems
CPI	consumer price index
draft decision	AER, *Draft decision, Envestra Ltd Access arrangement proposal for the Qld gas network, 1 July 2011 – 30 June 2016*, February 2011
earlier access arrangement	Access arrangement for 1 July 2006 to 30 June 2011 inclusive
earlier access arrangement period	1 July 2006 to 30 June 2011
NGL	National Gas Law
NGR	National Gas Rules
Opex	operating expenditure
QCA	Queensland Competition Authority
revised access arrangement information	Envestra, *Queensland access arrangement information*, 23 March 2011
revised access arrangement proposal	Envestra, *Access arrangement for the Queensland gas distribution system*, 23 March 2011

Overview

Envestra owns gas distribution pipelines in Queensland that supply natural gas to customers in and around Brisbane and a number of regional centres including Ipswich, Rockhampton and Gladstone. In total around 84 000 residential, 3000 small business and 70 large commercial and industrial customers are serviced by the network. The network is a natural monopoly and is regulated by the AER under the National Gas Rules (NGR) and National Gas Law (NGL) to ensure that Envestra does not charge excessive prices or impose unduly onerous terms and conditions on customers.

This is the AER's final decision on access arrangements for Envestra's Queensland gas network for the period 1 July 2011 to 30 June 2016. This final decision follows the draft decision released by the AER on 17 February 2011, and addresses the issues raised in Envestra's revised access arrangement proposal and in submissions from interested parties.

In its draft decision, the AER confirmed that some tariff increases are warranted so that Envestra can continue to provide a safe and reliable service. However, the AER did not accept Envestra's access arrangement proposal as the proposed tariffs were too high and the terms and conditions too much in favour of Envestra. The AER required a number of amendments to Envestra's access arrangement proposal, including reductions to proposed capital and operating expenditures, a lower rate of return, and revised terms and conditions.

In large part, Envestra did not accept the AER's draft decision. Envestra's revised access arrangement proposal represented an increase in expenditure and prices compared to the access arrangement proposal. The increase in expenditure from that originally proposed by Envestra was a result of updated labour input costs and insurance costs, alternative price assumptions for unaccounted for gas costs and an adjustment to the opex base year forecast to reflect audited regulatory account data.

The AER has accepted the need for expenditure in a number of areas where further substantiation of the prudence and efficiency of costs has been demonstrated by Envestra. However, overall the AER has come to the view that Envestra's revised access arrangement proposal is not acceptable because the proposed tariffs are too high and the terms and conditions are too much in favour of Envestra. The AER is proposing to revise the tariffs and terms and conditions of access proposed by Envestra for its gas distribution network. The AER considers its revisions will better balance the interests of Envestra and network users.

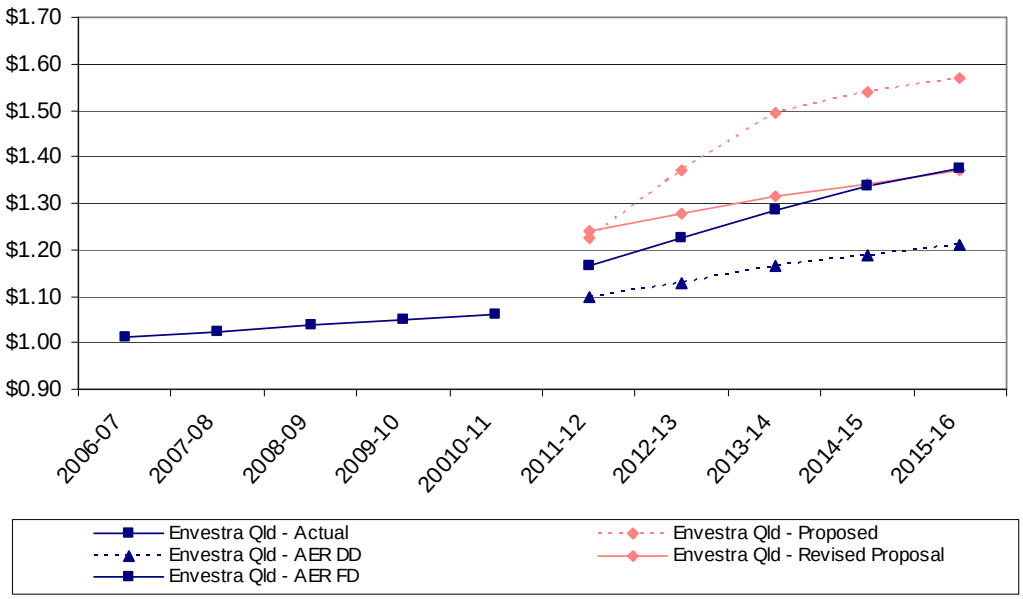
The main elements of the AER's final decision are set out below. More detail can be found in the relevant chapters. This final decision should be read in conjunction with the draft decision, Envestra's revised access arrangement proposal, submissions from interested stakeholders, and the AER's consultants' reports, which are available on the AER's website.

The AER will publish its access arrangement proposal incorporating the revisions set out in this final decision before 1 July 2011.

Tariffs

Envestra's proposed tariffs are shown as an index in figure 1 along with the tariffs that the AER has calculated in this final decision. The tariffs are calculated based on forecasts of required capital expenditure for new pipeline assets as the network grows, the replacement of existing assets as needed, the costs of capital and the cost of operating Envestra's business. In addition, the tariffs reflect forecasts of demand on the network over the next five years. This final decision sets out the AER's considerations and own forecast of each of these cost components.

Figure 1: Real price index – haulage tariffs (index price starts at $1 for 2005–06)



Source: AER analysis

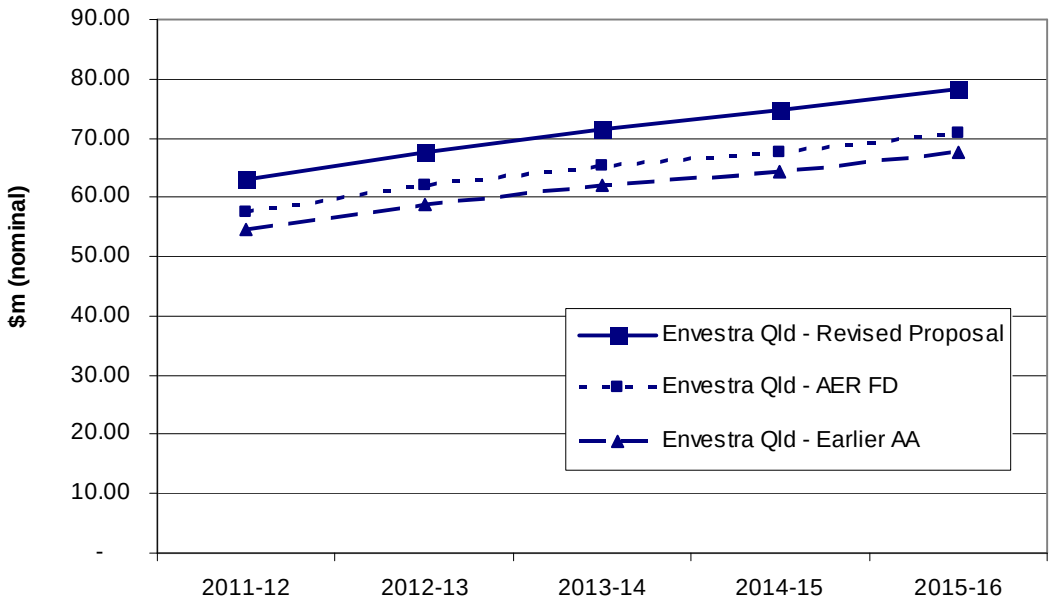
The tariff increases accepted by the AER for the access arrangement period are higher than applied over the earlier access arrangement period, but lower than those proposed by Envestra. The increases are driven by several factors, with the main cause being higher financing costs. Envestra has also revised its remaining asset lives, leading to higher depreciation. As well, operating costs will increase by around 9 per cent compared to costs over the earlier access arrangement period due to higher labour costs and other factors. These issues are discussed in more detail below and in the relevant chapters of this draft decision.

Cost of capital

The AER has determined a cost of capital of 9.77 per cent, which compares with the cost of capital of 10.98 per cent proposed by Envestra in its revised access arrangement proposal. As the cost of capital in the earlier access arrangement period was 8.75 per cent, the AER's decision increases Envestra's revenue requirement by 5.1 per cent over the access arrangement period. The higher cost of capital is the most significant driver of real tariff increases over the access arrangement period.

Figure 2 shows Envestra's revenue (including ancillary services revenues) in the access arrangement period under a number of cost of capital scenarios.

Figure 2: Envestra's forecast revenue under different cost of capital scenarios



Source: AER analysis.

The parameters used to calculate the cost of capital by Envestra and the AER are shown in table 1.

Table 1: Envestra's proposed and AER's allowed cost of capital parameters

Parameters	Envestra revised proposal	AER final decision
Nominal risk free rate (%)	5.60	5.56
Inflation forecast (%)	2.52	2.55
Cost of debt (%)	10.27	9.37
Debt risk premium (%)	4.67	3.81
Cost of equity (%)	12.04	10.36
Equity beta	0.99	0.80
Market risk premium (%)	6.50	6.00
Gearing (%)	60.00	60.00
Nominal cost of capital (%)	**10.98**	**9.77**

The AER considers that the parameters proposed by Envestra do not meet the requirements of the NGR. In addition, the AER does not consider Envestra's proposed approach of calculating the cost of equity meets the requirements of the NGR.

Capital expenditure

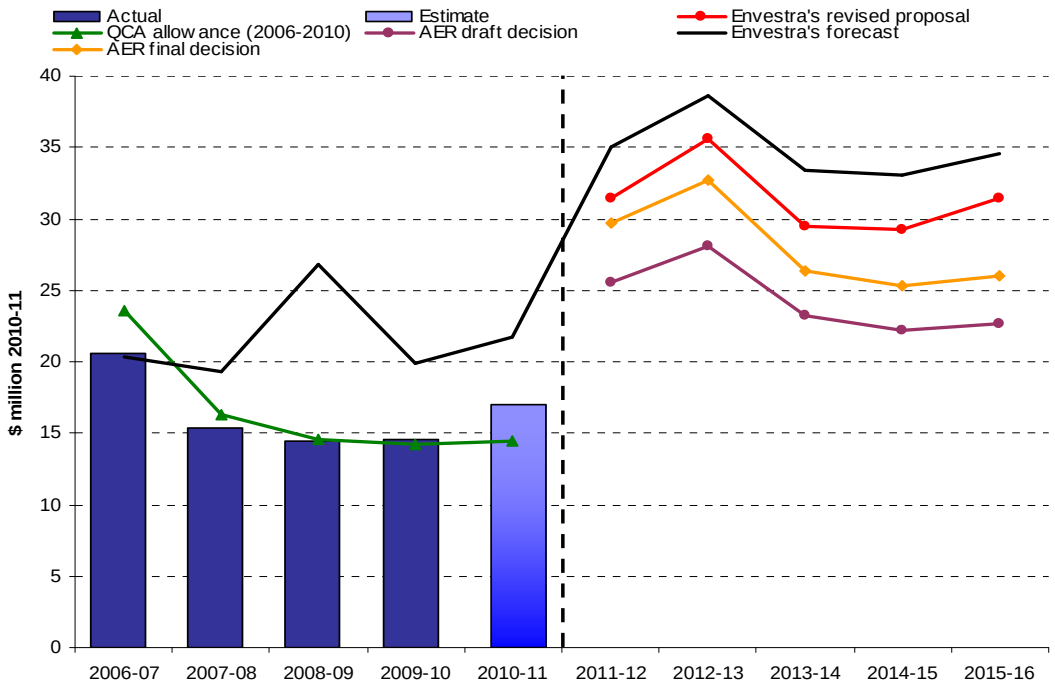
In its draft decision, the AER reduced Envestra's forecast capital expenditure to $121 million ($2010-11). This represented a reduction of 30 per cent compared to Envestra's original proposal of $173 million. In response to the matters raised in the AER's draft decision, Envestra revised its capital expenditure to $157 million.

Envestra accepted the AER's draft decision to reduce the scope of the proposed mains replacement program. However, Envestra did not accept the AER's amendments in relation to labour and material input cost escalators, contingency allowances and overheads. In this final decision, the AER maintains its view that Envestra has overestimated input cost escalation, contingency allowances and forecast overhead costs for the access arrangement period, and proposes to reduce the forecast capex accordingly.

The AER's draft decision required Envestra to roll forward its capital base at the next access arrangement review using forecast depreciation. This allows for the recovery of a significant proportion of any capex under expenditure, should Envestra choose for commercial or other reasons not to pursue the capex program as envisaged. This was not accepted by Envestra in its revised access arrangement proposal. However, for the reasons set out in chapter 3, the AER maintains its view that forecast depreciation should be used to establish Envestra's opening capital base for the next access arrangement period.

The AER's final decision on Envestra's forecast capex results in a real increase in expenditure of 71 per cent over the access arrangement period, compared to the 92 per cent increase forecast by Envestra, as shown in figure 3.

Figure 3: Total capex - Envestra proposed and AER final decision



Source: AER analysis

Operating expenditure

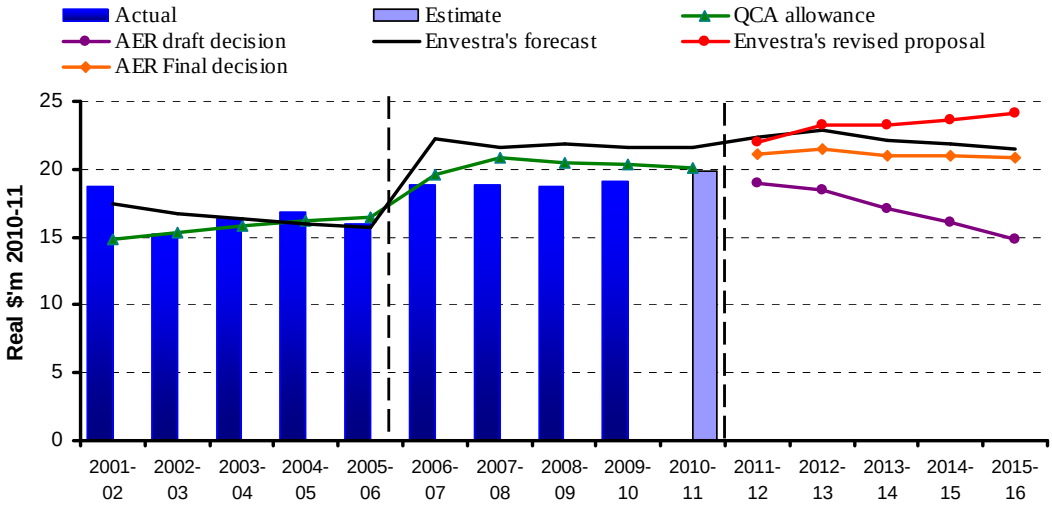
In the draft decision, the AER reduced Envestra's forecast operating expenditure to $85 million. This represented a reduction of 23 per cent compared to Envestra's access arrangement proposal of $111 million. In response to the matters raised in the AER's draft decision, Envestra revised its operating expenditure to $115 million.

The AER maintains its view that Envestra's forecast operating costs are not prudent and efficient and the lowest sustainable cost of managing its network, as the NGR requires. While accepting Envestra's revised proposal to not apply a base year efficiency adjustment, its proposed UAG price forecast and its insurance costs, the AER requires revisions to:

- remove the development and deployment program from the network development expenditure
- apply alternative input cost escalators
- amend the expected leak repair cost savings resulting from the mains replacement program.

The adjustment made by the AER to Envestra's revised forecast operating costs results in a real increase of 10 per cent on actual expenditure over the earlier access arrangement period, compared to the 22 per cent increase forecast by Envestra. The lower levels of opex accepted by the AER are shown in figure 4.

Figure 4: Total opex - Envestra proposed and AER final decision

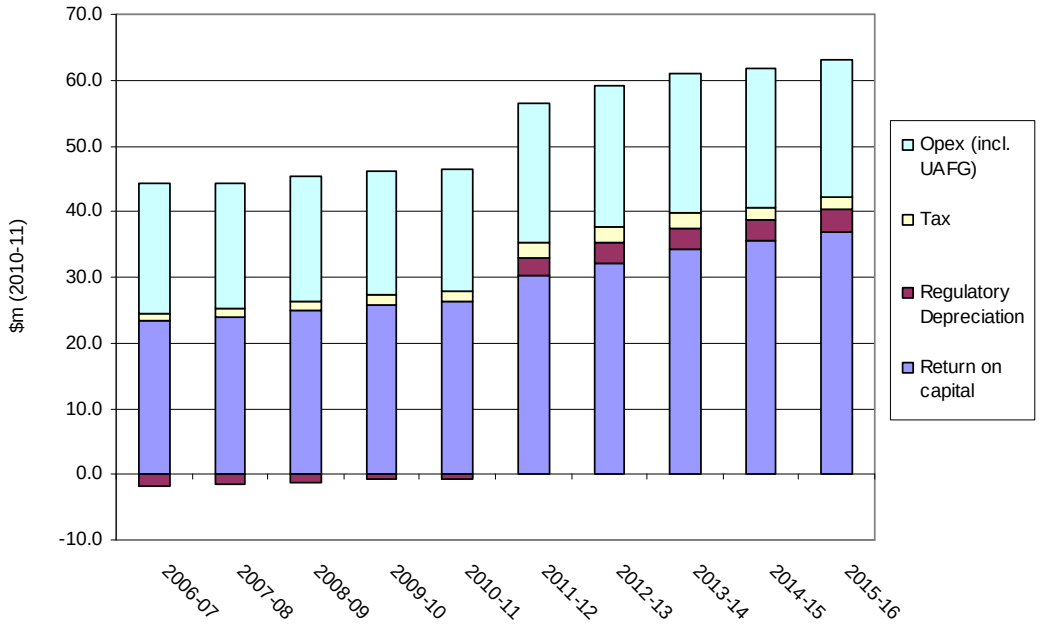


Source: AER analysis

Revenue requirement

The AER has calculated Envestra's revenue requirement (including ancillary services revenues) over the access arrangement period to be $328 million (nominal), a real increase of 37 per cent over the earlier access arrangement period. This compares to Envestra's forecast revenue requirement of $376 million (nominal), a real increase of 71 per cent. The forecast revenue requirement is shown in figure 5.

Figure 5: AER's approved revenue requirement for Envestra (including ancillary services)



Source: AER analysis

The AER's forecast revenue requirement is based on forecast capital and operating expenditure considered to be prudent and efficient, forecast depreciation, forecast inflation, a provision for tax, and the return on capital. The main reasons for the difference between the AER revenue requirement and Envestra's revised access arrangement proposal are changes to the rate of return parameters, the capex and opex forecasts, and the forecast cost of taxation. In determining Envestra's total tax allowance, the AER has incorporated the recent Australian Competition Tribunal ruling that a gamma value of 0.25 is appropriate.

Other issues

In its draft decision, the AER required that the incentive mechanism, proposed by Envestra, operate symmetrically and include certain reporting requirements to ensure that any efficiencies made can be verified. Envestra's revised proposal largely reflected the AER's amendments, except those requiring the provision to the AER of information on opex and capex classification changes (including the calculation of their impact on forecasts) and alteration to the equation for calculating carryover amounts in the first year of the next access arrangement period. The AER does not accept these elements of Envestra's revised access arrangement proposal.

Envestra accepted many aspects of the AER's draft decision on cost pass through events, however, Envestra proposed further revisions. The AER has accepted a number of these revisions, including the additional insurer insolvency event and proposed amendments to the definition of a regulatory change event, and cost pass through procedures. However, the AER does not accept Envestra's proposed revision to the materiality threshold, and maintains its draft decision that costs incurred from

an eligible cost pass through event should be assessed against one per cent of the smoothed forecast revenue in the years those costs are incurred.

The AER accepts Envestra's proposed demand forecasting approach is reasonable. However, as the AER has amended the total revenue allowance proposed by Envestra for the access arrangement period, the resulting lower distribution price increases will lessen the expected demand response from customers. For this reason, the AER proposes to revise the network price adjustments applied to the demand forecasts to reflect the approved total revenue allowance. The AER's final decision provides for forecast total demand which is, on average, 0.5 per cent higher than forecast by Envestra.

Terms and conditions

Envestra's access arrangement sets out the proposed terms and conditions that are not directly related to the nature or level of tariffs paid by users. The AER's draft decision did not accept a number of the terms and conditions of Envestra's access arrangement proposal and required them to be amended. Envestra accepted many of the AER's amendments but proposed modifications or did not accept a number of the AER's required amendments.

The AER accepts most of Envestra's proposed modifications to the wording of clauses as they do not affect the substance of the clauses. However, the AER proposes not to approve some of Envestra's revised terms and conditions. The AER considers the amended provisions for these terms and conditions better promote the national gas objective of the NGL.

Background

The AER is responsible for the economic regulation of covered natural gas distribution pipelines in all states and territories (except WA). The AER's functions and powers are set out in the NGL and the NGR. The NGL and NGR came into effect on 1 July 2008. Prior to this, the National Third Party Access Code for Natural Gas Pipeline Systems provided the relevant regulatory framework for gas distribution pipelines.

On 1 October 2010, Envestra submitted an access arrangement proposal for its Queensland gas distribution network for the period 1 July 2011 to 30 June 2016. In accordance with the NGR, the AER published Envestra's access arrangement proposal on 21 October 2010. Interested parties were invited to make submissions on the proposal and four submissions were received. Envestra also presented its access arrangement proposal at a public forum held in Brisbane on 28 October 2010.

The AER released its draft decision on Envestra's access arrangement proposal on 17 February 2011, and held a public forum to explain its decision on 1 March 2011. In response, Envestra submitted a revised access arrangement proposal to the AER on 24 March 2011. Interested parties were invited to make submissions on the draft decision and revised access arrangement proposal, and four submissions were received.

1 Introduction

1.1 Background

Envestra is a publicly listed company formed in 1997 when it acquired natural gas distribution networks in South Australia, Queensland and the Northern Territory.[1]

Envestra has contracted out the operation of its Queensland gas distribution network to the APA Group under an operating and management agreement (OMA).[2]

Envestra's Queensland network comprises 2375 km of pipeline delivering gas to approximately 84 000 customers in the main centres of Brisbane (north of the Brisbane River), Ipswich, Rockhampton and Gladstone. The assets used to service Brisbane constitute the major part (76 per cent) of the network.[3]

1.2 Regulatory requirements

The AER is responsible for the economic regulation of covered natural gas distribution pipelines in all states and territories (except WA). Envestra's Queensland gas distribution network is a covered pipeline.[4] The AER's functions and powers are set out in the NGL and the NGR.

1.3 Draft decision

The AER issued its draft decision not to approve Envestra's access arrangement proposal for its Qld gas distribution network for the period 1 July 2011 – 30 June 2016 on 17 February 2011 (draft decision). The AER held a public forum on the draft decision on 1 March 2011.

1.4 Revised access arrangement proposal

Envestra submitted a revised access arrangement proposal and revised access arrangement information for its Qld gas distribution network to the AER on 24 March 2011. Envestra set out its response to the AER's draft decision through a series of attachments to the revised access arrangement information.

1.5 Structure of final decision

The AER's consideration of Envestra's revised access arrangement proposal and revised access arrangement information is set out as follows:

- Introductory chapters outline the regulatory environment, network description and pipeline services.

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1 Envestra, *Qld access arrangement information*, October 2010, p. 46.
2 Envestra, *Qld access arrangement information*, October 2010, p. 44.
3 Envestra, *Qld access arrangement information*, October 2010, pp. 8–9 and 189.
4 AEMC, *List of natural gas pipelines*, viewed 9 December 2010, <http://www.aemc.gov.au/Gas/Scheme-Register/Pipeline-list-summary.html>.

- Part A outlines the key components of the total revenue building blocks including the capital base, depreciation, the rate of return, taxation, the incentive mechanism, operating expenditure and a summary of total revenue.

- Part B outlines the demand forecasts, reference tariffs and tariff variation mechanisms.

- Part C outlines the non-tariff components of the revised access arrangement proposal.

1.6 Next steps

The NGR provides that if the AER does not approve an access arrangement proposal it must propose an access arrangement or revisions to the access arrangement for the relevant pipeline.[5]

The AER has proposed revisions as set out in its final decision. These revisions have been formulated with regard to the matters required to be included in an access arrangement by the NGL and NGR, Envestra's revised access arrangement proposal, and the AER's reasons for refusing to approve that proposal.[6] The AER will not be consulting on its proposed revisions.[7]

The AER must make a decision giving effect to its proposed revisions within two months of making this final decision. The AER expects to make this decision by the end of June 2011.

5 NGR, r. 64(1).
6 NGR, r. 64(2).
7 NGR, r. 64(3).

2 Pipeline services

Envestra's revised access arrangement proposal describes the type and nature of pipeline services to be provided. This includes those services likely to be sought by a significant part of the market (reference services) and non-reference services.

The AER's draft decision did not require any amendments to Envestra's proposed pipeline services. The AER remains satisfied that Envestra has identified the pipeline to which the access arrangement relates and described the proposed pipeline services and specified reference services in accordance with the requirements of the NGR.

2.1 Regulatory requirements

Rule 48(1) of the NGR provides that a full access arrangement must specify certain information for pipeline services, including reference services. Pipeline services include haulage services, interconnection services and ancillary services.[8] Reference services are defined as pipeline services that are likely to be sought by a significant part of the market.[9] An access arrangement must:

- identify the pipeline to which the access arrangement relates and a website at which a description of the pipeline can be inspected[10]
- describe the pipeline services the service provider proposes to offer to provide by means of the pipeline[11]
- specify the reference services, and the terms on which those services are provided.[12]

Rule 109(1) of the NGR provides that a pipeline service provider must not make it a condition of the provision of a service that the prospective user also accept another non-gratuitous service, unless the bundling of services is reasonably necessary.

2.2 Revised access arrangement proposal

Chapter 2 of the AER's draft decision did not identify any required amendments to Envestra's access arrangement proposal in relation to pipeline services. Envestra's revised access arrangement proposal in relation to pipeline services is unchanged from its access arrangement proposal.

2.3 AER's consideration

The AER's consideration of Envestra's proposed pipeline services is set out in chapter 2 of the draft decision.

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8 NGL, s. 2.
9 NGR, r. 101(2).
10 NGR, r. 48(1)(a).
11 NGR, r. 48(1)(b).
12 NGR, r. 48(1)(c) and r. 48(1)(d).

2.4 Conclusion

As set out in chapter 2 of the draft decision, the AER considers Envestra has appropriately identified the pipeline to which the access arrangement relates and described the proposed pipeline services in accordance with the requirements of the NGR. The AER approves Envestra's proposed pipeline services and specification of reference services as these comply with r. 48(1)(a)–(d) of the NGR.

Part A – Total revenue (building block components)

3 Capital base

This chapter sets out the AER's consideration and analysis of the opening capital base and projected capital base in the revised access arrangement proposal.

In its revised access arrangement proposal, Envestra proposed an opening capital base on 1 July 2011 of $316 million ($ nominal). This was consistent with the AER's assessment of Envestra's opening capital base in its draft decision. Envestra accepted the AER's increase to allowed depreciation of $0.6 million ($ nominal). The AER has updated the opening capital base to $319 million ($ nominal) to reflect the actual inflation for the 2010–11 year of the earlier access arrangement period.

In the draft decision the AER accepted forecast capex of $121 million ($2010–11). In response, Envestra forecast capex of $157 million ($2010–11) over the access arrangement period. Envestra did not accept the AER's amendments to labour and material input cost escalators, contingency allowances and overheads. As set out in its draft decision, the AER considers that Envestra has overestimated real cost escalation, forecast overhead costs and contingency allowances. In total, the AER proposes forecast capex of $140 million ($2010–11) over the access arrangement period, $19 million higher than the amount accepted in the draft decision.

The AER does not accept Envestra's revised access arrangement proposal to roll forward its asset base using actual depreciation during the access arrangement period. The AER proposes that a forecast depreciation approach should be used to establish Envestra's opening capital base for the next access arrangement period.

The AER has calculated a closing capital base on 30 June 2016 of $458 million ($ nominal).

3.1 Regulatory requirements

In assessing Envestra's opening capital base, the AER is required to consider the transitional provisions of the NGR (Clause 3(2) of schedule 1 of the NGR). This relates to actual or forecast capex (new facilities investment) under s. 8.21 of the Code.

In relation to the opening and projected capital base, the NGR requires Envestra to demonstrate:

- capex (by asset class) over the earlier access arrangement period (72(1)(a)(i) of the NGR)
- how the capital base is arrived at including a demonstration of how it is increased or diminished over the previous access arrangement period (r. 72(1)(b) of the NGR)
- the opening capital base is derived in accordance with r. 77(2). Rule 77(2) specifies the components that contribute to the derivation of the opening capital base including conforming capex, depreciation and redundant and disposed of assets

- a forecast of conforming capex (r. 72(1)(c)(i) of the NGR) and depreciation over the access arrangement period, including a demonstration of how it is derived (r. 72(1)(c)(ii) of the NGR)

- that the forecasts must be arrived at on a reasonable basis, and must represent the best forecast or estimate possible in the circumstances (r. 74(2) of the NGR)

- the projected capital base is derived using the formula (opening capital base plus forecast conforming capex less forecast depreciation and disposed pipeline assets) in r. 78 of the NGR

- forecast capex is such as would be incurred by a prudent service provider (r. 79(1)(a) of the NGR)

- forecast capex is justifiable on a ground stated in r. 79(2) of the NGR. Such as, where the overall economic value is positive, or that either the expenditure is necessary to maintain and improve the safety of services or to comply with a regulatory obligation or meet levels of demand for services existing at the time the capex is incurred.

Rule 90 of the NGR requires that the 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 capex.

Rule 85(1) of the NGR allows an access arrangement to include a capital redundancy mechanism. The AER may also require such a mechanism in the access arrangement.

The NGR also requires Envestra to show the key expenditure performance indicators to be used to support the expenditure to be incurred over the access arrangement period (r. 72(1)(f) of the NGR).

3.2 Revised access arrangement proposal

In its draft decision, the AER accepted most elements of Envestra's proposal in regards to its capital base. However, the AER outlined a number of amendments required in order to approve Envestra's access arrangement proposal. In particular, the AER required Envestra to:

- amend its forecast capex by applying the real cost escalators established by the AER

- remove overhead costs of $11 million ($2010-11) applied to its capex program

- remove the contingency allowance of $0.7 million (2010-11) applied to its capex program

- halve the cost of its proposed mains replacement capex for its Brisbane network

- increase its opening capital base by $5.9 million ($ nominal) because of the impact of depreciation and inflation for the earlier access arrangement period

- use forecast depreciation to roll forward its capital base from 1 July 2011.

In its revised access arrangement proposal, Envestra accepted the amendments in regard to the use of forecast depreciation in the earlier access arrangement period.[1] However, Envestra did not accept the following amendments in its revised access arrangement proposal:[2]

- the application of the real cost escalators determined by the AER
- the AER's forecast of overheads costs of $2.5 million ($2010–11) in each year of its access arrangement period
- the removal of the costs associated with contingency allowances
- the value of the reduction to its planned mains replacement program for the Brisbane area
- the AER's requirement to use forecast depreciation to roll forward its capital base from 1 July 2011 as the next revision of the access arrangement.

3.2.1 Opening capital base

In its revised access arrangement proposal, Envestra accepted the AER's draft decision to recalculate Envestra's capital base as at 1 July 2011 using forecast depreciation from the earlier access arrangement period.[3]

Envestra's revised opening capital base of $316.4 million ($ nominal) is the same as that accepted in the AER's draft decision (amendment 3.1).[4] Table 3.1 shows the calculation of the opening capital base.

Table 3.1: Opening capital base ($m, nominal)

	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
Opening capital base	230.5	249.9	269.4	283.8	299.3	316.4
Add conforming capital expenditure	18.4	14.1	13.8	14.2	17.0	
Add indexation	5.8	10.9	6.8	8.4	7.8	
Less depreciation	4.9	5.5	6.3	7.1	7.7	
Closing capital base	249.9	269.4	283.8	299.3	316.4	

Source: Envestra, *Revised Qld access arrangement information*, March 2011, attachment 8–2, p. 3.

1 Envestra, *Revised Qld access arrangement information*, March 2011, attachments 7-7 and 8-2.
2 Envestra, *Revised Qld access arrangement information*, March 2011, attachments 7-7 and 8-2.
3 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 8-2, p. 1.
4 AER, *Draft decision*, February 2011, p. 43.

3.2.2 Projected capital base

Envestra did not accept the AER's draft decision on the projected capital base. In particular, Envestra maintained its approach on real cost escalators, overheads and contingencies for forecast capex and the application of actual depreciation in rolling forward the capital base. Based on these revisions, Envestra calculated a revised projected capital base of $474 million ($ nominal) on 1 July 2016. This included forecast capex of $175 million ($ nominal) and depreciation of $65 million ($ nominal) for the access arrangement period.[5]

3.2.2.1 Capital expenditure for the access arrangement period

In its revised access arrangement proposal, Envestra forecast capex of $157 million ($2010–11) compared with $175 million ($2010–11) in its access arrangement proposal.[6] [7] The revised forecasts reflected adjustments to cost escalators, overheads and the contingency allowance. Envestra has forecast $52 million ($2010–11) for mains replacement capex and $72 million ($2010–11) for growth assets capex, compared with Envestra's previous forecasts of $77 million ($2010–11) and $67 million ($2010–11) respectively. Envestra also recalculated the impact of the removal of half of its proposed mains replacement program for Brisbane, resulting in an increase in capex of $0.8 million ($2010–11) compared to the AER's draft decision.[8]

Envestra's revised forecast capex is shown in table 3.2.

Table 3.2: Forecast capex for the access arrangement period ($m, 2010–11) [a]

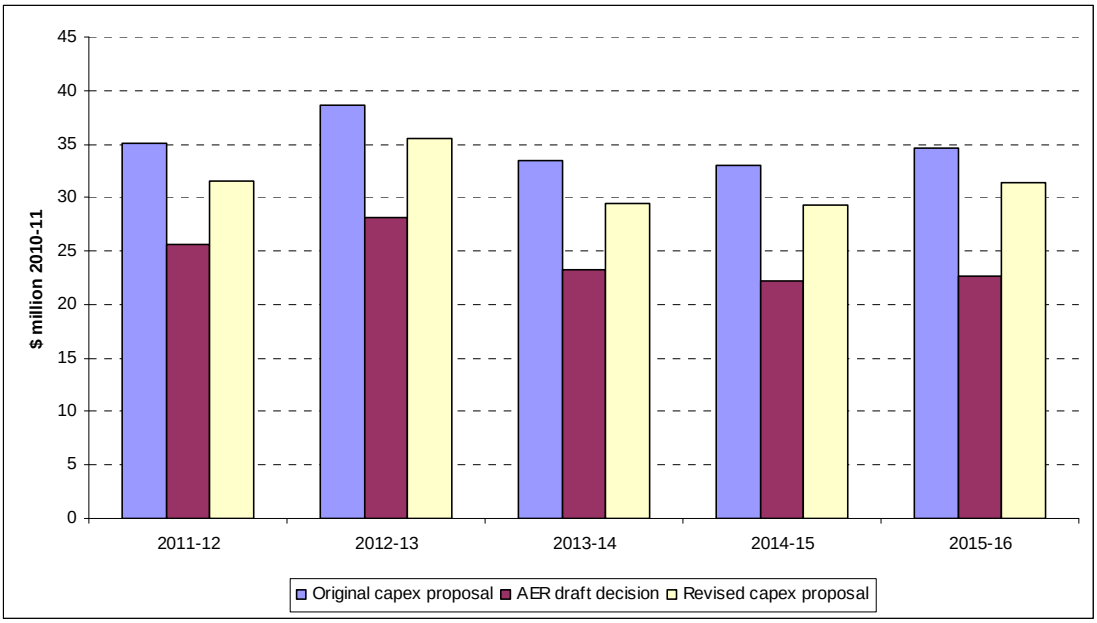
	2011–12	2012–13	2013–14	2014–15	2015–16	Total
Mains replacement	9.6	10.0	10.5	10.8	11.1	51.9
Meter replacement	1.4	1.4	1.5	1.5	1.6	7.7
Augmentation	0.6	4.7	0.1	0.3	0.4	6.2
Telemetry	0.5	0.3	0.4	0.5	0.3	2.2
Regulators and valves	0.5	0.5	0.4	0.3	0.4	2.2
IT	2.7	1.4	1.0	0.1	0.1	5.3
Growth assets	13.9	14.8	13.9	13.9	15.6	72.3
Other distributions system	1.7	1.9	1.6	1.5	1.6	8.6
Other non-distribution system	0.3	0.3	0.2	0.2	0.2	1.1
Total	31.5	35.6	29.5	29.3	31.4	157.4

Source: Envestra, *Qld Revised access arrangement information*, March 2011, p. 10.
(a) The AER has converted 2009–10 real dollars to 2010–11 real dollars.

Figure 3.1 compares the AER's draft decision with Envestra's forecast capex in its revised access arrangement proposal and its original access arrangement proposal.

5 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 8–2, p. 3.
6 Envestra, *Revised Qld access arrangement information*, March 2011, p. 10.
7 Envestra, *Qld access arrangement information*, October 2010, p. 87.
8 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-7, p. 8.

Figure 3.1: AER approved and Envestra proposed forecast capital expenditure



Cost escalators

Envestra's revised proposed input cost escalators are discussed in appendix B.

Overheads

Envestra submitted that the AER erred in not accepting that overheads increase if there is a material increase in capex.[9] Envestra's revised access arrangement proposal included analysis of the historical fixed and variable proportions of each overhead component in order to forecast overhead costs based on the variable proportion of these components. Envestra's capital overhead components and the fixed and variable proportions are shown in table 3.3.

[9] Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-7, p. 2.

Table 3.3: Envestra's capital overhead components

Overhead component	Description	Fixed proportion	Variable proportion
Operations Management and Administration	Includes the cost of senior management involvement in the management of capital projects and the costs involved in providing associated administrative support.	70%	30%
Planning & System Design	Includes the costs in providing network analysis, design, mapping and costing support in relation to network extensions and modifications.	0%	100%
Procurement and Fleet	Includes the procurement costs and maintenance of vehicles involved in capital activities.	0%	100%
Technical Assurance	Includes the costs of providing: ▪ Medium to high-level technical audits; ▪ Training with respect to field operations; ▪ Development, conduct and maintenance of competency-based skills system; ▪ Risk assessments; and ▪ Regulatory compliance assurance.	50%	50%
Network Engineering	Includes the costs of providing design and engineering of transmission pressure pipelines and non-standard gas distribution assets such as major I&C meter stations, regulator sets, etc	70%	30%
Support	Includes the indirect costs in the business that support the capitalised overhead departments above (e.g. Finance, IT, HR, HSE and Insurance).	100%	0%

Source: Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-7, p. 3 and AER, Email to Envestra, *AER EN.RP.03–Question on capex overheads*, 31 March 2011, attachment.

Envestra submitted that certain aspects of overhead costs vary with material increases in capex:[10] Envestra noted the Essential Services Commission of Victoria (ESCV), in its last review of Victorian gas distribution businesses, had acknowledged that overheads increase if there is a material increase in capex.[11]

Envestra indicated the lower overhead rate (of 10 per cent) had been applied to all of the mains replacement capex and all of the augmentation capex, rather than just to the incremental capex amounts. In addition, the rate of 10 per cent is consistent with the rate of incremental capex determined by the ESCV in its last reset for Victorian gas distributors.

Envestra considered the overhead rate as a percentage of total capex was consistent with the overhead rate applied by the ESCV toSP Ausnet in its review of Victorian gas distributors. Further, Envestra suggested its high level benchmarking of overheads

[10] Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-7, pp.2-5.
[11] Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-9, *Parsons Brinckerhoff, Level of Overheads.*

using data from electricity distribution businesses showed a strong correlation between total expenditure and total overheads as a percentage of capex.

Contingency allowance

In its revised access arrangement proposal, Envestra submitted the AER has misconstrued Envestra's use of the term contingency and its application in the context of various projects.[12] Envestra argued that:[13] [14]

- the estimates used baseline cost estimates developed from the partially complete project definitions available at the time of estimating and Envestra added a percentage contingency to account for specific cost items that will arise, but which are not yet quantifiable due to the incomplete nature of the project definitions

- the requirement to forecast in some cases up to seven years in the future means that it has not been able to undertake the usual front-end engineering detailed design that usually accompanies projects. As well, some of these projects are also uncommon, increasing the difficulty of estimating the cost. It's forecast capex costs therefore can be represented as the sum of the baseline estimate and a contingency for uncosted items

- the application of contingencies reflects the gap between incomplete and complete project definition rather than an amount to simply cater for cost over-runs or uncertainties. The contingency 'closes the gap' between the baseline estimate derived from the incomplete project definition and the baseline estimate derived from the completed project definition.

- section 24(2) of the NGL allows a service provider to be given reasonable opportunity to recover at least the efficient costs of providing reference services. Where a capex item is uncosted because of incomplete project definition, Envestra must therefore be allowed an amount to cover the costs of that item.

Envestra reduced its contingency allowances by 25 per cent in its revised access arrangement proposal on the basis of advice from PB that the contingency amount may contain some allowance for contingent risk.[15]

Envestra also acknowledged that it accepts the removal of the contingency allowance in relation to new services (inlets) as the contingency related solely to account for contingent risk.[16] Envestra, however, contends that the amount of contingency removed by the AER for new services ($3.2 million ($2010–11)), as supported by Wilson Cook, is overstated because Envestra only included an estimated contingency amount for existing homes ($1.1 million ($2010–11)).[17]

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12 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-7, p. 5.
13 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-7, pp.5-8.
14 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-8, *Parsons Brinckerhoff, Application of contingencies in cost estimating.*
15 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-7, p. 6.
16 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-7, p. 8.
17 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-7, p. 8.

3.2.2.2 Forecast depreciation allowance in the access arrangement period

Envestra did not accept the AER's draft decision to apply forecast depreciation to roll forward Envestra's capital base from 1 July 2011. Envestra submitted that the use of actual inflation in adjusting the capital base strengthens the incentives to improve efficiencies, particularly in cases where capital expenditure is not included in the efficiency carryover mechanism.[18] Envestra stated that even though there is an absence of a formal service quality incentive scheme for the gas sector, and potentially less incentive to direct expenditure towards improving service quality, gas is a fuel of choice `with consumers having the option of reverting to electricity in place of gas for their energy requirements. Envestra also stated that the use of forecast depreciation can result in negative asset values and that incorporating negative capital base values is contrary to s. 24(2) of the NGL which states that Envestra must be provided with a reasonable opportunity to recover its efficient costs.[19]

Envestra's projected capital base is outlined in table 3.4.

Table 3.4: Revised projected capital base ($m, nominal)

	2011–12	2012–13	2013–14	2014–15	2015–16
Opening capital base	316.4	347.0	382.1	411.2	441.0
Plus conforming capex[a]	33.4	38.6	32.9	33.4	36.7
Less depreciation	10.8	12.2	13.4	13.9	15.1
Inflation adjustment	8.0	8.7	9.6	10.4	11.1
Closing capital base	347.0	382.1	411.2	441.0	473.7

Source: Envestra, *Qld Revised access arrangement information*, March 2011, attachment 8-2, p. 3.
(a) These are end of year values.

3.3 Summary of submissions

The AER received one submission from an interested party commenting on the AER's draft decision and Envestra's revised access arrangement proposal:

Mr Kevin McMahon submitted that hot water assets that Envestra has sold to Origin Energy should not be included in Envestra's asset base and that pass through costs in relation to these assets should be adjusted to show that this is no longer a pass through cost that is borne by Envestra.[20]

3.4 AER's consideration

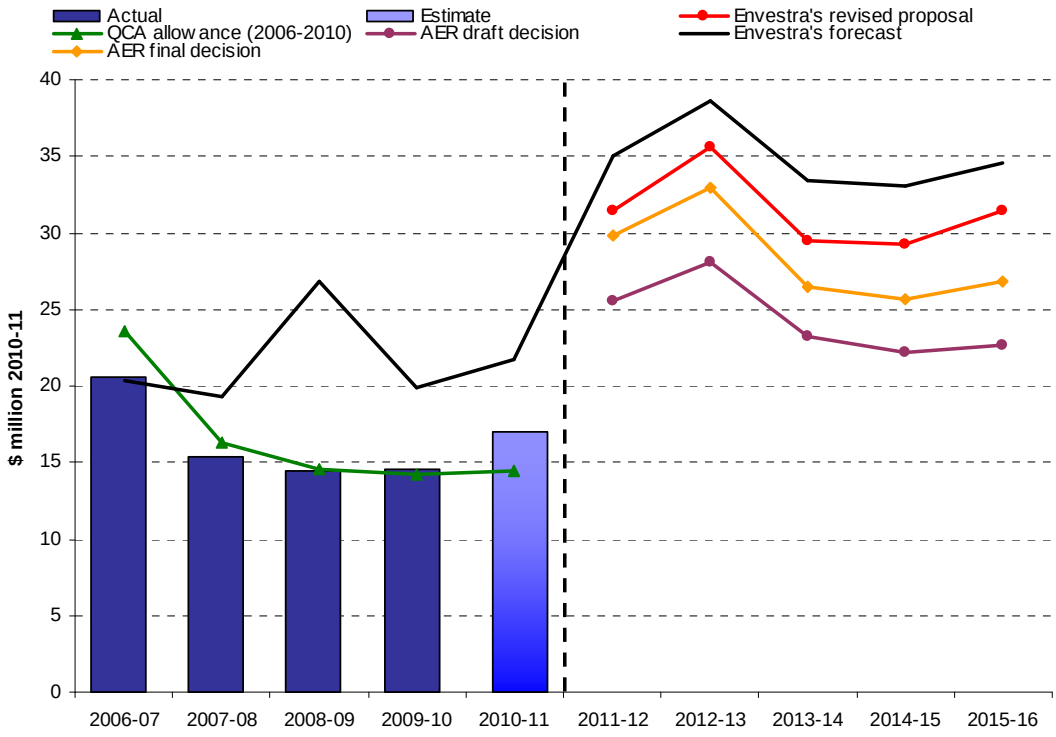
Certain aspects of Envestra's revised capital base are in accordance with the AER's draft decision or have been otherwise justified. However, the AER does not accept Envestra's revised capital base because the revisions overall do not meet the requirements of the NGR. For total forecast capex, the AER proposes a total amount

18 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 8-2, p. 1.
19 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 8-2, p. 3.
20 Mr Kevin McMahon, *Submission to the AER draft decision*, April 2011.

of $140 million ($2010–11) for the access arrangement period compared with $158 million ($2010–11) in the revised access arrangement proposal.

Figure 3.2 shows the actual incurred and estimated capex of the earlier access arrangement period with both Envestra's and the AER's proposed forecasts of capex for the access arrangement period.

Figure 3.2 Envestra actual and forecast capital expenditure



Source: Envestra, *Qld access arrangement information*, October 2010, pp. 87, 106–107.
Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 7-7, p. 10.
Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 8-2, p. 3.
QCA, Proposed Access Arrangements for Gas Distribution Networks - Allgas Energy Limited and Envestra Limited: Final Decision, October 2001, pp. 176 and 186 .
QCA, Revised Access Arrangement for Gas Distribution Networks: Envestra: Draft Decision, May 2006, pp. 57, 69 and 85.

The AER does not accept the forecast overhead costs, approximately half of the proposed contingency allowance or Envestra's input cost escalators. The AER's assessment of Envestra's input cost escalators and overheads had the greatest impact on reducing Envestra's capex from the levels forecast in its revised access arrangement proposal. In addition, the AER proposes that forecast depreciation be used to roll forward the capital base when the access arrangement is next revised. The AER's consideration of these issues is set out below.

3.4.1 Opening capital base

3.4.1.1 Opening capital base for the earlier access arrangement period

In the draft decision the AER accepted Envestra's proposed value for the opening capital base as at 1 July 2006. The draft decision also accepted the updated inflation adjustment for 2005–06. The AER has determined an opening capital base as at 1 July 2006 of $230.5 million (nominal).

3.4.1.2 Depreciation used in the roll forward model

The AER in its draft decision did not accept Envestra's proposal to apply actual depreciation in the calculation of the opening capital base. The AER recalculated Envestra's capital base as at 1 July 2011 using forecast depreciation from the earlier access arrangement period. The AER accepts Envestra's revised access arrangement proposal to apply forecast depreciation in rolling forward the capital base. The revised depreciation amounts for the earlier access arrangement period are shown in table 3.5.

Table 3.5: AER approved depreciation for the earlier access arrangement period ($m, nominal)

	2006–07	2007–08	2008–09	2009–10	2010–11
AER approved straight-line depreciation	4.9	5.5	6.3	7.1	7.7

Source: AER analysis, *Envestra QLD RAB roll forward model*, March 2011.

3.4.1.3 Inflation for 2010-11

In the draft decision, the inflation adjustment for 2010-11 of 2.52 per cent for the capital base was based on a forecast figure as the CPI for March 2011 was unknown at the time. This CPI figure was also unknown when the service providers submitted their revised access arrangement proposals. The AER has updated the inflation adjustment for 2010-11 to 3.33 per cent based on the annual change in the CPI to 31 March 2011. Other things being equal, this means Envestra's opening capital base as at 1 July 2011 will be marginally higher than Envestra's revised access arrangement proposal.

3.4.1.4 Summary on the opening capital base

The AER considers that Envestra's proposed opening capital base is not consistent with r. 77(2) or r. 74(2) of the NGR. The AER therefore proposes a revision to the opening capital base to account for changes to inflation, including the update to actual inflation for the March 2011 quarter, as set out in revision 3.1. Based on the depreciation adjustments, the AER has determined the opening capital base to be $318.9 million as at 1 July 2011.

3.4.2 Projected capital base

3.4.2.1 Forecast capital expenditure

In its draft decision, the AER accepted most of Envestra's capex programs for the access arrangement period. The AER, however, accepted only half of the proposed mains replacement program for the Brisbane network and did not accept all the related costs proposed by Envestra in its access arrangement proposal for its capex programs.

In particular, the AER considered that the contingency allowance, overheads and input cost escalators associated with Envestra's capex programs were not justified. Envestra has provided additional information in support of these related costs in its revised access arrangement proposal. In light of this information, the AER considers some of the related costs can now be accepted. However, the AER maintains its draft decision not to accept Envestra's approach to the estimation of costs associated with real cost escalation, contingency allowances and overheads costs. Details on the AER's consideration of these costs are discussed in section 3.4.2.2.

On the basis of its revised access arrangement proposal, the AER accepts Envestra's recalculation of the impact of the removal of half of its proposed mains replacement program for Brisbane, an increase in capex of $0.8 million ($2010–11) compared to the draft decision.

In relation to the submission received, on the basis of advice from Envestra, the AER accepts that hot water assets are not included in Envestra's capital base and that any costs associated with the ongoing provision and maintenance of these assets are also not included in its revised access arrangement.[21]

3.4.2.2 Cost escalators, overheads and contingencies

This section summarises the AER's views on the capex related costs presented by Envestra in its revised access arrangement proposal. These costs are applied to all of Envestra's capex projects in the access arrangement period. Envestra indicated the adjustment to labour and material escalators and overheads by the AER had the most significant impact on its capex forecast.[22]

Input cost escalators

In its draft decision, the AER was not satisfied that the proposed input cost escalators applied to Envestra's forecast capex complied with the requirements of r.79 and r.74(2) of the NGR and required Envestra to amend its forecast capex.

The AER's consideration of Envestra's revised proposed input cost escalators is discussed in appendix B. For the reasons outlined in appendix B; the AER is not satisfied that the revised input cost escalators applied to Envestra's forecast capex comply with the requirements of r. 79 and r. 74(2) of the NGR. In particular, the AER does not accept the following elements of Envestra's proposal:

- wage forecasts based on the average weekly ordinary time earnings (AWOTE) index
- non-inclusion of productivity adjustments
- 'gas network materials' forecast methodology
- application of real cost escalators.

As a result the AER proposes to revise Envestra's forecast capex by applying the real input cost escalators set out in B.3 of appendix B.

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21 Envestra, Email to the AER, *AER.EN.RP.12 Hot water assets in Qld*, 5 May 2011.

22 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-7., p. 1.

Overheads

In its draft decision, the AER considered Envestra's approach to the recovery of overheads to be too simplistic and likely to overstate overhead costs over time.[23] In its revised access arrangement proposal, Envestra identified those components of overhead costs that are fixed and those linked to the size of the capex program. The AER considers the revised method is a better approach to forecasting overhead costs.

As per the draft decision, the AER accepts Envestra's proposed composition of the capital overheads and that the components are those that would be incurred for the delivery of pipeline services.[24] The AER has reviewed Envestra's split of capital overhead components between fixed and variable components. Table 3.6 sets out the AER's conclusions on Envestra's proposed capital overhead components.

[23] AER, *Draft decision*, February 2011, p. 36.
[24] AER, *Draft decision*, February 2011, p. 35.

Table 3.6: AER's conclusion on Envestra's capital overhead components

Overhead component	Envestra proposal		AER consideration	AER conclusion	
	Fixed proportion	Variable proportion		Fixed proportion	Variable proportion
Operations Management and Administration	70%	30%	Envestra will require additional resources, such as dedicated program managers and project initiation coordinators, to manage its expanded capex program. However, based on its review of Envestra's Asset Management Plan, in particular the APA Management structure outlined in section 2.6.2, the AER considers that Envestra has overstated the additional volume of the resources required.[25]	85%	15%
Planning & System Design	0%	100%	The AER accepts that planning and system design works are impacted by the size of the capital program. However, the AER considers that not all aspects of these costs are directly proportional to the size of the capital program, for example where the same project plan can be used for a number of similar projects. The AER also considers that Envestra will be able to utilise existing planning and system design resources, mitigating the need to increase resources in direct proportion to its expanded capex program.	50%	50%
Procurement and Fleet	0%	100%	The AER accepts Envestra's proposal.	0%	100%
Technical Assurance	50%	50%	The AER accepts Envestra's proposal.	50%	50%
Network Engineering	70%	30%	The AER accepts Envestra's proposal.	70%	30%
Support	100%	0%	The AER accepts Envestra's proposal.	100%	0%

Although the AER accepts a significant proportion of Envestra's proposed capex overheads, it considers that the forecast overheads proposed by Envestra are too high and therefore not consistent with r. 79(1)(a) of the NGR.[26] The AER considers that total capex overhead costs of $17 million ($2010–11) comply with the requirements of the NGR compared to a total cost of $22 million ($2010–11) proposed by Envestra, a reduction of 24 per cent. This adjustment has been made on the basis of the

[25] Envestra, *Qld access arrangement information*, October 2010, attachment 7-2, p. 11.
[26] NGR, r. 72(1)(c)(i) and r. 74(2)(b).

information provided by Envestra on the composition of its overheads in 2009–10.[27] This information showed approximately 22 per cent of Envestra's capitalised overheads were apportioned to operations, management and administration activities and approximately 38 per cent were apportioned to planning and system design activities. As the AER considers that the variable proportion of these costs are not as high as that proposed by Envestra, the imputed contribution of these significant components of capitalised overheads to capex has been reduced.

Contingency allowance

In its draft decision, the AER considered that a contingency allowance for a cost estimation risk factor may be appropriate in some circumstances. In particular, a contingency may be appropriate where an inherent risk or a contingent risk could be identified in the determination of the base estimate. The AER considered that Envestra's proposed contingencies for each of its capex categories did not include details on the justification of a specific contingency, but rather applied a general contingency allowance. On this basis, and taking into account Envestra's substantial experience in the construction, installation and estimation of its capex activities, the AER concluded that the capex contingencies applied by Envestra were excessive and did not meet the requirements of r. 79(2)(c) of the NGR.[28]

Envestra's revised access arrangement proposal claims to exclude contingent or inherent risks from its contingency allowance. Envestra state that the contingency costs are intended to provide for specific cost items that cannot be quantified due to the incompleteness of the project definitions, but which are expected to be incurred to their full extent during the access arrangement period. The AER considers Envestra's revised explanation as to the basis of its contingency allowance reflects a more appropriate approach to estimating contingencies.

On the basis of its review of the project definitions supporting Envestra's capex estimates, as well as the range of specific cost items allowed for in Envestra's contingency allowance, the AER considers that the capex contingencies applied by Envestra are excessive and do not meet the requirements of r. 79(2)(c) of the NGR. The AER considers that approximately 50 per cent of the specific cost items included in detailed estimates based on completed project definitions are absent from Envestra's less detailed project definitions. The AER accepts that this proportion of cost items represents an identifiable set of specific cost items that are likely to impact on Envestra's baseline estimates. The AER therefore proposes that Envestra should be allowed 50 per cent of the proposed contingency allowance in its revised access arrangement proposal. This approach results in a total contingency cost of $0.34 million ($2010–11) compared to a total cost of $0.68 million ($2010–11) proposed by Envestra in its revised access arrangement proposal.

Incomplete project definitions

The AER reviewed the specific issues identified by Envestra as responsible for the gap between the cost estimates based on incomplete and completed project

[27] Envestra, Email to the AER, *AER.EN.12 Responses to questions on Capitalised Overheads*, 29 November 2010.

[28] AER, *Draft decision*, February 2011, p. 34.

definitions.[29] Envestra stated that without addressing these issues it cannot quantify certain costs that will be incurred.[30]

The AER considers that Envestra's considerable experience in the estimation and delivery of capex projects should reduce the uncertainty related to these issues. For example, the AER considers that Envestra should have sufficient experience to enable it to undertake a front end engineering design study to complete the project scope and enable project controls to be defined for a significant proportion of its projects. The AER also considers that Envestra should have sufficient experience with capex projects to enable it to estimate contractor costs having regard to the prevailing market and taking account of specific hazards (e.g. confined spaces) and required working arrangements (e.g. night work to address traffic management requirements). Evidence of this is the capex costs and unit rates material, and the level of detail provided to show the derivation of these costs, that Envestra was able to include in its proposal.[31]

The AER, however, does agree that Envestra's ability to establish specific design details may be affected by the impact of underground services from various utilities. In particular, the AER considers that coordination with other utilities, route particulars and protection arrangements of other utilities may impact on Envestra's design requirements. Envestra's baseline estimates are likely to be affected by the impact of environmental and traffic issues on design requirements and working practices. The impact on project definitions is likely to be more significant for mains replacement work in the CBD. In regards to Envestra's claim that providing estimates for projects that may occur up to six years in the future is unrealistic, the AER accepts that for some less common projects there may be some difficulty in completing the project definition to enable reliable estimates to be calculated.[32] However, the AER also considers that a significant proportion of Envestra's proposed capex work for the access arrangement period will be based on reasonably well established templates.

Cost items not fully identified

The AER reviewed PB's analysis of the cost items included by Envestra in its contingency provision.[33] PB undertook to identify the cost items included by Envestra in the contingency amount which were not able to be fully identified, but are likely to form part of the final definition of projects. The majority of cost items relate to the specific issues included as part of the incomplete project definitions discussed above.

The AER considers that Envestra would have a reasonable appreciation of a significant number of these cost items given its experience in the estimation and construction of projects. However, the AER accepts that some of these costs would be difficult to identify at the early stage of project development. For example, the relocation of shallow mains that are below statutory levels of cover may not be identified at the early stage of a project's development. Also, lower gas pressures than

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29 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-8, *Parsons Brinckerhoff, Application of contingencies in cost estimating,* p. 4.

30 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-8, *Parsons Brinckerhoff, Application of contingencies in cost estimating,* p. 4.

31 Envestra, *Qld access arrangement information*, November 2010, attachment 7-1

32 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-8, *Parsons Brinckerhoff, Application of contingencies in cost estimating,* p. 4.

33 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 7-8, *Parsons Brinckerhoff, Application of contingencies in cost estimating,* pp. 4-6.

anticipated are likely to necessitate additional works and the use of larger diameter steel pipe. Re-routing of trunk mains and equipment can compromise preliminary designs that have assumed lengths based on existing routes. Project controls associated with mains replacement in the CBD are also likely to have a cost impact.

In its revised submission, Envestra identified that some of its contingency allowance may contain some allowance for contingent risk which was objected to by the AER in its draft decision.[34] The AER considers it is not appropriate that a non-specific general contingency allowance be included in expenditure estimates and therefore accepts that it is appropriate that Envestra reduce its contingency by 25 per cent.

In its review of Envestra's revised access arrangement proposal, Wilson Cook maintained its view that[35]:

> ……whilst a contingency allowance may need to be called upon in some instances, such allowances are unlikely to be called upon generally, or to their full extent; and to argue that they would is to suggest that the business concerned is unable to estimate its costs accurately or that that it does not wish any risk of cost overruns to remain.

Wilson Cook also noted that Envestra's revised access arrangement proposal did not acknowledge that the cost estimates are generally based on average costs of pipe-laying per kilometre and that such rates by definition reflect the average of the many different situations that are encountered when the work is undertaken. Wilson Cook therefore concluded that it is not clear that the contingency sums are for entirely "un-costed" items or activities.[36]

The AER accepts Wilson Cook's view that contingency allowances are likely to be called upon in some instances but not generally, due to a business's ability to estimate costs accurately. The AER considers that while Envestra has attempted to accurately estimate the baseline component of its capex, it has been unable to fully identify all costs relevant to its capex program where the program is based on incomplete project definitions. The items that remain uncosted due to incomplete project definitions are included in the capex program cost estimate by way of a contingency allowance. Envestra's cost estimates are generally based on average historical costs that reflect the different situations that are encountered when work is undertaken. The AER also considers that Envestra's contingency allowance applies at least in part to some unidentified cost items or activities that may not have been included in Envestra's baseline cost estimates. The AER does, however, consider that some of Envestra's claimed uncosted factors are likely to have been included in the historical costs used to determine baseline costs and therefore should not be included as part of a contingency allowance.

The AER's approach to reducing Envestra's proposed contingency allowance is consistent with the submission from the ECCSA which considered that lower contingency rates should be used than those applied by Envestra, especially where

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34 Envestra, *Revised Qld access arrangement information*, March 2011, p. 6, attachment 7-8, *Parsons Brinckerhoff, Application of contingencies in cost estimating*, p. 7.

35 Wilson Cook, *Report – Envestra (Qld)*, May 2011, p. 4.

36 Wilson Cook, *Report – Envestra (Qld)*, December 2010, pp. 4-5.

average rates from direct experience have been used. The ECCSA also indicated that for normal construction projects, a contingency of 5 per cent or less may be used.[37]

3.4.2.3 Conclusion on capital expenditure

The AER considers that Envestra's forecast capex in its revised access arrangement proposal does not comply with the requirements of r. 79 of the NGR. That is, it does not represent capex that 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.

Table 3.7 summarises the capex proposed by Envestra in its revised access arrangement proposal in comparison to the capex which the AER considers satisfies the capex criteria of the NGR.[38]

Table 3.7: Revised capital expenditure and approved capital expenditure for 2011–2016 ($m, 2010–11)

	2011–12	2012–13	2013–14	2014–15	2015–16	Total
Mains replacement						
Envestra proposed	9.6	10.0	10.4	10.7	11.1	51.9
AER approved	9.2	9.3	9.4	9.4	9.2	46.4
Growth assets						
Envestra proposed	13.9	14.8	13.9	13.9	15.6	72.2
AER approved	13.1	13.5	12.4	12.0	12.9	64.0
Other capital expenditure						
Envestra proposed	8.0	10.7	5.2	4.6	4.8	33.3
AER approved	7.4	9.9	4.5	3.9	3.9	29.7
Total capital expenditure						
Envestra proposed	31.5	35.5	29.6	29.3	31.4	157.4
AER approved	29.7	32.7	26.3	25.3	26.0	140.1

Source: Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 7-7.

As shown in Figure 3.2, the AER's approved capex is higher than that approved in the draft decision. Based on the AER's analysis, the difference of $19 million ($2010-11) between the AER's draft and final decisions can be attributed to contingencies (about 47 per cent), cost escalators (about 27 per cent), overheads (about 23 per cent) and

[37] ECCSA, *AER Draft Decision, a response, April* 2011, p. 27.
[38] NGR, r. 79.

recalculation of the impact of the removal of half of its proposed mains replacement program for Brisbane (about 4 per cent). Based on the information available to the AER during the draft decision process, the AER incorrectly removed contingency allowances to Envestra's proposed capex on mains replacement, meter replacement and replacement of hazardous services (inlets). The removal of a contingency allowance to these capex items was reversed in the final decision.

3.4.2.4 Depreciation

In its revised access arrangement proposal, Envestra accepts the forecast depreciation allowance proposed by the AER in its draft decision.[39] The AER's assessment of Envestra's forecast depreciation allowance in its revised access arrangement proposal is presented in chapter 4 of the final decision. Table 3.8 reproduces the conclusions from that chapter.

Table 3.8: AER approved depreciation for the access arrangement period ($m, nominal)

	2011–12	2012–13	2013–14	2014–15	2015–16
Straight-line depreciation	10.9	12.2	13.4	13.9	14.9
Inflationary gain	8.1	8.9	9.7	10.3	11.0
Regulatory depreciation	2.8	3.3	3.7	3.5	4.0

The AER proposes that Envestra amend its revised forecast depreciation as set out in chapter 4 of this final decision.

3.4.2.5 Adjustment to the capital base for inflation

In its revised access arrangement proposal, Envestra accepts the forecast inflation rate of 2.52 per cent proposed by the AER in its draft decision.[40] However, as noted in the draft decision, the forecast inflation amount has been updated based on the most up to date information. As discussed in chapter 5 the AER has proposed a forecast inflation rate of 2.55 per cent.

3.4.2.6 Summary of the projected capital base

The AER has considered the components of Envestra's proposed projected capital base. Given the amendments required to Envestra's proposed capex, forecast depreciation and adjustment of the capital base for inflation, the AER considers that Envestra's projected capital base does not comply with r. 74(2) and r. 78 of the NGR. The AER proposes to revise the projected capital base as set out in revision 3.5 of this draft decision.

3.4.3 Closing capital base for the access arrangement proposal

The AER considers that forecast depreciation should be used to roll forward the capital base to 30 June 2016. The AER does not accept Envestra's revised access arrangement proposal that actual depreciation be used to roll forward the capital

[39] Envestra, *Revised Qld access arrangement information*, March 2011, attachment 8-2, p. 3.
[40] Envestra, *Revised Qld access arrangement information*, March 2011, attachment 9-10, p. 1.

base.[41] The AER considers its reasoning outlined in the draft decision remains valid.[42] The AER primary reasons for deciding on a forecast depreciation approach included the dynamics of the gas industry (including a gas distributor's ability to defer investment), the service quality incentives facing gas distributors and consistency with other gas access arrangements. It has also addressed the specific concerns raised by Envestra below.

In its revised access arrangement proposal, Envestra set out a number of reasons why its proposal to use actual depreciation should be adopted. It challenged the AER's assessment of the differences between gas and electricity networks. It argued against the need for consistency across jurisdictions and raised concerns over the possibility of negative asset values. The AER's consideration of these issues follows.

Envestra stated that gas is a fuel of choice and that incentives for deferring capex and maintaining service quality were the same across gas and electricity networks. The AER disagrees with Envestra judgement on the ability of electricity and gas distributors to defer investment. If gas is a fuel of choice, the AER considers growth related capex could be particularly susceptible to changing circumstances that make expansion at the speed previously envisaged uneconomic. The assertion that gas is a fuel of choice therefore does not seem to support Envestra's position. In terms of replacement capex, the AER is not convinced by Envestra's assertion that because gas is a fuel of choice it makes deferring investment unlikely. The AER accepts that Envestra faces incentives to preserve service quality, even in the absence of a formal service quality incentive scheme as applied to electricity distribution. However, the AER still considers that given the nature of the service there is greater scope to defer investment in gas distribution compared to electricity distribution. In electricity distribution, service can be completely cut by relatively minor equipment failures. However, gas service is unlikely to be interrupted through an increase in UAG, unless a major breach occurs. This provides gas distributors with relatively greater flexibility in the timing of replacement capex than electricity distributors.

The AER does not agree with Envestra's assertion that consistency across gas distributors on this matter is not relevant and that it can elect the approach it prefers. Envestra is correct in saying that r. 90(2) of the NGR allows them to elect to use forecast or actual depreciation to roll forward the capital base. However, under r. 40(3) the AER has full discretion as to whether it accepts or rejects Envestra's choice. Forecast depreciation has been used in all gas distribution access arrangements to date and the AER considers this a relevant consideration as to the preferable approach.

The AER considers the possible occurrence of a negative asset value at the end of the access arrangement period for one or more asset classes does not invalidate a forecast depreciation approach. While negative asset values may be inconsistent with standard accounting practices, the AER is concerned with regulatory requirements of the NGR. There may be occasions were it is appropriate for assets with negative values to form part of the capital base. There are a variety of situations in which such assets have entered the capital bases. For example, capital contributions may be separately accounted for as a negative asset. The AER does not accept that negative asset values

[41] Envestra, *Revised Qld access arrangement information*, March 2011, attachment 8-2, pp. 1-3.
[42] AER, *Draft decision*, February 2011, pp. 40–42.

deprive Envestra of a reasonable opportunity to recover its costs, as contended by Envestra.[43] Negative asset values will only emerge in the present context in circumstances where Envestra received a forecast depreciation allowance which subsequently proves to be greater than the capex Envestra actually spent on the assets in question. While this is an unlikely outcome, it could occur. If it does occur the negative asset value represents funds received from tariff revenues for which no costs were incurred. This money should then be returned to customers as a negative asset. Thus the overall effect is neutral for both Envestra and its customers.[44]

3.5 Conclusion

Opening capital base

The AER does not approve the opening capital base proposed by Envestra for the access arrangement period as it does not comply with r.77(2) or 74(2) of the NGR. Envestra accepted the elements of AER's draft decision on the approach to indexation of the capital base over the earlier access arrangement period, the estimated capital base as at 30 June 2006, and capital base for the earlier access arrangement period. However, the AER proposes revision 3.1 to update the opening capital base using actual inflation for the final year of earlier access arrangement period (2010–11), as set out below.

Projected capital base

The AER does not approve the proposed projected capital base proposed by Envestra as it does not comply with r. 78 and r. 79 of the NGR. The AER's proposed revisions 3.3 (total forecast depreciation for the access arrangement period), 3.4 (forecast capex for the access arrangement period) and 3.5 (projected capital base for the access arrangement period) are set out below.

Closing capital base for the access arrangement period

The AER does not approve the proposed estimation of depreciation on the basis of actual capital expenditure for establishing Envestra's opening capital base for the access arrangement period commencing 1 July 2016. The AER has determined that forecast depreciation be used to roll forward the capital base at the beginning of the next access arrangement period. The AER proposes the amendments to reflect the revision 3.2, as set out below.

3.6 Revisions

The AER proposes the following revisions:

Revision 3.1: amend the revised access arrangement information to delete table 8.6 and replace it with the following, and make all other elements of the access arrangement and access arrangement information consistent with the following:

[43] Envestra, *Revised SA access arrangement information*, March 2011, p. 3.

[44] The AER's draft decision provides an illustration of this neutrality principle. See AER, *Draft decision*, February 2011, pp. 40–42.

Table 3.9: AER approved opening capital base ($m, nominal)

	2006–07	2007–08	2008–09	2009–10	2010–11	2011–12
Opening capital base	230.5	249.9	269.4	283.8	299.3	318.9
Add capex[a]	18.4	14.1	13.8	14.2	17.0	
Add indexation	5.8	10.9	6.8	8.4	10.3	
Less depreciation	4.9	5.5	6.3	7.1	7.7	
Less redundant assets	0.0	0.0	0.0	0.0	0.0	
Less disposals	0.0	0.0	0.0	0.0	0.0	
Closing capital base	249.9	269.4	283.8	299.3	318.9	

[a] Excludes capital contributions

Revision 3.2: amend the revised access arrangement information to delete references that actual depreciation be used to roll forward the capital base at the next access arrangement period and replace them with forecast depreciation.

Revision 3.3: amend the revised access arrangement information to delete table 8.12 and replace it with the following:

Table 3.10: Forecast depreciation for the access arrangement period ($ m, nominal)

	2011–12	2012–13	2013–14	2014–15	2015–16
Depreciation	2.8	3.3	3.7	3.5	4.0

Revision 3.4: amend the revised access arrangement information to reflect the following table, and make all other elements of the access arrangement and access arrangement information consistent with the following:

Table 3.11: AER approved forecast capex ($m, 2010-11)

	2011–12	2012–13	2013–14	2014–15	2015–16	Total
Mains replacement	9.2	9.3	9.4	9.4	9.2	46.4
Meter replacement	1.3	1.4	1.3	1.3	1.4	6.7
Augmentation	0.6	4.4	0.1	0.2	0.4	5.6
Telemetry	0.5	0.3	0.3	0.4	0.3	1.9
Regulators and valves	0.5	0.4	0.4	0.3	0.3	1.9
IT	2.6	1.4	1.0	0.1	0.1	5.2
Growth assets	13.1	13.5	12.4	12.0	12.9	64.0
Other distributions system	1.6	1.7	1.4	1.3	1.4	7.4
Other non-distribution system	0.2	0.3	0.2	0.2	0.2	1.0
Total	29.7	32.7	26.3	25.3	26.0	140.1

Revision 3.5: amend the revised access arrangement information to delete table 8.13, and replace with the following, and make all other elements of the access arrangement and access arrangement information consistent with the following:

Table 3.12: Projected capital base for the access arrangement period ($m, nominal)

	2011–12	2012–13	2013–14	2014–15	2015–16
Opening capital base	318.9	347.6	379.8	405.5	430.9
Add capex	31.5	35.6	29.4	29.0	30.6
Add indexation	8.1	8.9	9.7	10.3	11.0
Less depreciation	10.9	12.2	13.4	13.9	14.9
Less redundant assets	0.0	0.0	0.0	0.0	0.0
Less disposals	0.0	0.0	0.0	0.0	0.0
Closing capital base	347.6	379.8	405.5	430.9	457.5

Revision 3.6: make any and all consequential amendments necessary in the revised access arrangement and revised access arrangement information to take account of and reflect revisions 3.1 to 3. 5.

4 Depreciation

The AER's draft decision accepted Envestra's proposed standard and remaining asset lives for the access arrangement period. However, the AER rejected Envestra's forecast depreciation allowance due to changes in various factors that affected the capital base. The AER determined a forecast regulatory depreciation allowance of $17.6 million (nominal) based on the straight-line approach for the access arrangement period.

In response to the draft decision, Envestra did not accept various aspects of the AER draft decision that affected the capital base and therefore the forecast regulatory depreciation allowance. The AER's proposed changes to the capital base, including the inflation adjustment of the roll forward of the capital base, are discussed in chapter 3 of this decision. Envestra's revised forecast regulatory depreciation allowance is $17.6 million (nominal) over the access arrangement period.

The AER does not accept the forecast regulatory depreciation allowance proposed by Envestra for reasons discussed in chapter 3. In considering the AER's proposed changes to the capital base, the AER has calculated a total forecast regulatory depreciation allowance of $17.3 million (nominal) for the access arrangement period.

4.1 Regulatory requirements

Envestra is required to provide a depreciation schedule that sets out the basis upon which the assets constituting the capital base are to be depreciated for determining reference tariffs (r. 88(1) of the NGR). The schedule may consist of a number of separate schedules each relating to an asset or particular asset classes (r. 88(2) of the NGR).

Rule 89(1) of the NGR provides that 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 particular group of assets; and
>
> (d) so that (subject to rules about capital redundancy), an asset is depreciated only once (i.e. the amount by which an asset is depreciated over its economic life does not exceed the value of the asset as at the time of its inclusion in the capital base (adjusted, if the accounting method approved by the AER permits, for inflation)); and
>
> (e) so as to allow the service provider's reasonable needs for cash flow to meet financing, non-capital and other costs.

Rule 89(2) states that compliance with r. 89(1) may involve the deferral of a substantial amount of depreciation.

Clause 5(1)(d) of schedule 1 of the NGR, requires the AER, in deciding whether to approve an access arrangement revision proposal from a transitional access arrangement, to take into account the depreciation schedule for the transitional access arrangement under section 8.32 of the Code.[1]

4.2 Revised access arrangement proposal

The AER's draft decision accepted the proposed remaining and standard asset lives, and the use of the straight-line approach to calculate depreciation. However, the AER determined changes affecting the capital base were required. These changes impacted upon the forecast regulatory depreciation allowance which included the use of forecast depreciation to roll forward the capital base.

These changes are reflected in the forecast regulatory depreciation allowance proposed by Envestra, displayed in table 4.1.

Table 4.1: Envestra's forecast regulatory depreciation allowance for the access arrangement period ($m, nominal)

	2011–12	2012–13	2013–14	2014–15	2015–16
Nominal straight-line depreciation	10.8	12.2	13.4	13.9	15.1
Indexation	8.0	8.7	9.6	10.4	11.1
Regulatory depreciation	2.8	3.4	3.8	3.6	4.0

Source: Envestra Qld, Revised access arrangement submission (attachment 8-2), March 2011, p.3.

4.3 AER's consideration

Due to changes to the capital base proposed by the AER in chapter 3 of this final decision, the AER has recalculated the forecast regulatory depreciation for the access arrangement period. The AER notes that no submissions were received in relation to Envestra's forecast regulatory depreciation allowance. The revised forecast depreciation is shown in table 4.2.

[1] This clause is also relevant if the AER makes its own proposal for revision of a transitional access arrangement under r. 63 or r. 64 of the NGR.

Table 4.2: AER's forecast regulatory depreciation for the access arrangement period ($m, nominal)

	2011-12	2012-13	2013-14	2014-15	2015-16
Straight-line depreciation	10.9	12.2	13.4	13.9	14.9
Indexation	8.1	8.9	9.7	10.3	11.0
Regulatory depreciation	2.8	3.3	3.7	3.5	4.0

Source: AER analysis.

Regulatory depreciation is straight-line depreciation net of the inflation indexation applied to the capital base for each year. The inflation forecast has been updated to 2.55 per cent per annum for this decision, as discussed in chapter 5.

Envestra's depreciation schedule is consistent with r. 89(d) of the NGR that requires each asset is depreciated only once. No deferral of depreciation under r. 89(2) of the NGR is required in the present circumstances.

4.4 Conclusion

The AER does not accept the forecast regulatory depreciation allowance proposed by Envestra. This is primarily due to the AER's proposed adjustments to the opening capital base and capital expenditure discussed in chapter 3.

4.5 Revisions

The AER proposes the following revision:

Revision 4.1: amend the revised access arrangement and revised access arrangement information to reflect the forecast depreciation allowance in table 4.2.

5 Rate of return

The AER has rejected Envestra's proposed rate of return[1] of 10.98 per cent as it is not commensurate with prevailing market conditions in the market for funds and the risks involved in providing reference services. A rate of return of 9.77 per cent is appropriate for the benchmark service provider. The AER has undertaken a number of reasonableness checks to confirm the rate of return it has determined.

This chapter sets out the AER's consideration of the appropriate rate of return for Envestra for the access arrangement period and deals with issues raised in Envestra's revised access arrangement proposal. These issues include the determination of the applicable cost of equity model, risk free rate, market risk premium (MRP), equity beta and debt risk premium (DRP). Envestra's revised access arrangement proposal accepted the AER's approach to calculate the inflation forecast and gearing ratio.

The AER has confirmed its draft decision on the parameters to determine the rate of return, including rejection of Envestra's multi-model approach to estimate the cost of equity. The AER considers that the MRP, equity beta and DRP proposed by Envestra were too high with respect to the risks involved in providing reference services under prevailing market conditions. The AER has rejected Envestra's proposed change to the averaging period for estimating the risk free rate and the DRP. The rate of return of 9.77 per cent determined by the AER is based on the 15 day averaging period commencing 25 February 2011.

5.1 Regulatory requirements

Rule 72(1)(g) of the National Gas Rules (NGR) require that the access arrangement information for a full access arrangement proposal must include the proposed rate of return, the assumptions on which the rate of return is calculated and a demonstration of how it is calculated.

Rule 74 of the NGR requires that any forecast or estimate included in the access arrangement information be arrived at on a reasonable basis, be supported by a statement of the basis of that forecast or estimate, and represent the best forecast possible in the circumstances.

Rule 87(1) of the NGR requires that 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.

Rule 87(2) of the NGR requires that in determining a rate of return on capital, it will be assumed that the service provider meets benchmark levels of efficiency, 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. Further, a well accepted approach that incorporates the cost of equity and debt is to be used; and a well accepted financial model is to be used. The weighted average cost of capital (WACC) is given as an example of a well accepted approach, and the capital asset pricing model (CAPM) is given as an example of a well accepted financial model.

[1] Based on the nominal vanilla WACC formulation.

5.2 Revised access arrangement proposal

The AER did not approve Envestra's proposed rate of return as it did not comply with r.87 of the NGR. It required Envestra to amend its access arrangement to take account of the rate of return set out in table 5.1.

Table 5.1: AER draft decision on WACC parameters

Parameter	
Nominal risk free rate (%)	5.68
Inflation (%)	2.52
Equity beta	0.80
Market risk premium (%)	6.00
Debt risk premium (%)	3.93
Gearing (%)	60.00
Cost of debt (%)	9.61
Cost of equity (%)	10.48
Nominal vanilla WACC (%)	**9.96**

Source: AER, *Draft decision, Envestra Ltd access arrangement proposal for the Qld gas network 1 July 2011–30 June 2016*, February 2011, p. 92.

Envestra did not accept the AER's draft decision on the equity beta, MRP and DRP and cost of equity models. In support of its revised access arrangement proposal, Envestra submitted reports from the Competition Economists Group (CEG), Professor Bruce Grundy, SFG Consulting (SFG) and Value Adviser Associates (VAA).[2] Envestra accepted the AER's approach to calculate the inflation forecast. It proposed to apply an averaging period of 10 business days ending 10 March 2011 to calculate the bond rates.

Envestra has proposed a nominal vanilla WACC of 10.98 per cent in its revised access arrangement proposal, based on the 10 day averaging period ending 10 March 2011. Table 5.2 sets out Envestra's revised proposed WACC.

[2] CEG, *WACC estimation, a report for Envestra*, March 2011; Grundy, *Comment on the cost of capital: A report for Envestra*, 23 March 2011; SFG, *The required return on equity commensurate with prevailing conditions in the market for funds: response to draft decision, report prepared for Envestra*, 23 March 2011; SFG, *Issues affecting the estimation of MRP: report for Envestra*, 21 March 2011; VAA, *Comments on market risk premium in draft decision by AER for Envestra February 2011*, March 2011.

Table 5.2: Envestra revised access arrangement proposal WACC parameters

Parameter	Envestra revised proposal
Nominal risk free rate (%)	5.60
Equity risk premium (Equity beta × MRP) (%)	6.40
Debt risk premium (%)	4.67
Gearing (%)	60.00
Cost of equity (%)	12.00
Cost of debt (%)	10.30
Nominal vanilla WACC (%)	**10.98**

Source: Envestra, *Revised access arrangement information, Attachment 9-13: Proposed rate of return*, March 2011, p. 1.

5.3 AER's consideration

The AER has not accepted Envestra's rate of return as set out in its revised access arrangement proposal. The AER considers that the rate of return proposed by Envestra is excessive and inconsistent with the requirements of r. 87 of the NGR. In particular, the AER considers that the rate of return proposed by Envestra is not the best estimate commensurate with prevailing conditions in the market and the risk of providing reference services.

Having rejected Envestra's proposal the AER now needs to determine an alternative value. In determining an appropriate rate of return the AER has reviewed a variety of evidence and arguments, and has exercised its judgment to arrive at an outcome that it determines best satisfies the requirements of the NGR and NGL. The AER has also compared the rate of return it has determined against high level indicators for reasonableness. These indicators suggest that the rate of return established by the AER is at least sufficient to meet the objectives and requirements of the NGR and NGL.

The AER's considerations are summarised in the following sections:

- an evaluation of why the rate of return set by the AER is appropriate
- cost of equity models
- equity beta
- market risk premium (MRP)
- debt risk premium (DRP)
- averaging period and risk free rate
- gearing (debt to equity) ratio

- method of inflation forecast.

Further details on particular matters, including the overall rate of return, cost of equity models, equity beta, MRP and DRP are contained in appendix A.

5.3.1 Evaluation of the overall rate of return

This section considers the overall rate of return resulting from parameters determined by the AER elsewhere in this chapter. This assessment considers whether the overall rate of return determined by the AER is commensurate with prevailing conditions in the market for funds,[3] and that the service provider has an opportunity to recover at least its efficient costs.[4]

The AER's draft decision assessed the overall rate of return using market data and finance theory.[5] This analysis indicated that the overall rate of return set by the AER, although lower than the rate of return proposed by Envestra, was at least sufficient to meet the cost of capital faced by regulated service providers.

Envestra did not accept the AER's draft decision on the overall rate of return. Its revised proposal disputed the implications of recent regulated asset sales and the cost of equity implied from broker reports.

The techniques available to the AER to assess the overall rate of return, for its draft and now this final decision, can produce a broad range of plausible rates of return. In view of this, the AER primarily relies upon detailed analysis of the input parameters (discussed later in this chapter) in accordance with established finance practice to determine the rate of return. The additional overall techniques are given appropriate consideration in assessing the reasonableness of these results.

The AER has examined broker WACCs, regulated asset sales and trading multiples, and these analyses support the conclusion that the overall rate of return set by the AER is commensurate with prevailing conditions in the market for funds. Further, two of these analyses—recent regulated asset sales and trading multiples—suggest that that the regulated cost of capital has been at least as high as the actual cost of capital faced by the businesses, and most likely has been in excess of the actual cost of capital associated with the risks involved in providing reference services.

For this decision, the AER determines the overall rate of return using a nominal vanilla WACC of 9.77 per cent. This is based on a cost of equity of 10.36 per cent, a cost of debt of 9.37 per cent and a gearing ratio of 60 per cent. The cost of equity is estimated using the CAPM, an MRP of 6 per cent and an equity beta of 0.8. The cost of debt is estimated using a DRP of 3.81 per cent. The risk free rate is estimated at 5.56 per cent using 10 year Commonwealth Government Securities. The reasons behind these parameter inputs are summarised later in this chapter, with further details included in appendix A.

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3 NGR, r. 87(1).
4 NGL, s. 24(2)(a).
5 AER, *Draft decision, Envestra, Access arrangement proposal for the Qld gas network, 1 July 2011–30 June 2016*, 17 February 2011, pp. 234–245.

After considering the information before it, the AER considers that the overall rate of return of 9.77 per cent satisfies the requirements of the NGR and NGL. The AER's considerations on the overall rate of return are summarised below, with further details included in appendix A.

Broker reports

The WACC determined by the AER is within the broad range of discount rates applied in the equity broker reports submitted by Envestra (once converted to a consistent reporting basis), as evident in table 5.3.

Table 5.3: Comparison of WACC used by brokers and the AER (per cent)

Broker	Companies assessed	Nominal vanilla WACC
Citigroup	DUE, SKI	9.20–10.90
Credit Suisse	APA	9.35
Deutsche Bank	APA, DUE, SPN	9.22
Goldman Sachs	APA, ENV, SKI	10.04–10.66
Morgan Stanley	SPN	8.16
UBS	SKI	8.04–8.44
Wilson	HDF	10.02
Aggregate range	**APA, DUE, ENV, HDF, SKI**	**8.04–10.90**
AER	**(Benchmark firm)**	**9.77**

Source: Equity broker reports submitted by Envestra, AER analysis.
Note: This table shows only those brokers who report the WACC in vanilla form or provide sufficient detail to enable conversion to this form. More broker reports are included in appendix A where different forms of WACC are considered. Companies evaluated are APA Group (APA), DUET Group (DUE), Envestra Limited (ENV), Hastings Diversified Utilities Fund (HDF), Spark Infrastructure Group (SKI), and SP AusNet (SPN).

Regulated asset sales

Sales of regulated assets (including the sale of Country Energy's gas network in October 2010) have been at premiums to the value of the regulated asset base of between 20 and 119 per cent, as evident in table 5.4.[6]

[6] AER, *Draft decision, Envestra Ltd access arrangement proposal for the Qld gas network, 1 July 2011–30 June 2016*, 17 February 2011, pp. 235–236.

Table 5.4: RAB multiple for recent regulated asset sales

Date	Acquirer	Target	RAB multiple (times)
Dec 06	APA	Directlink	1.45
Oct 06	APA	Allgas	1.64
Aug 06	APA	GasNet	2.19
Apr 06	Alinta	AGL Infrastructure assets	1.41 – 1.52
Mar 06	APA	Murraylink	1.47
Aug 04	DEUT/Alinta/Alcoa	Dampier to Bunbury Natural Gas Pipeline	1.20
Aug 04	APA	Southern Cross Pipeline and Parmelia Gas	1.47
Apr 03	Alinta/AMP/Aquila	Alinta Gas Network	1.35
Apr 03	Alinta/AMP/Aquila	Multinet Gas	1.44
Apr 03	Alinta/AMP/Aquila	United Energy	1.52
Aug 02	CKI/HEH	Citipower	1.69
Oct 00	Consortium	ElectraNet	1.37
Sep 00	CKI/HEH	Powercor	1.71
Jun 00	Singapore Power	PowerNet	1.49
Dec 99	CKI/HEH	ETSA Utilities	1.26
Jul 99	CKI	19.97% of Envestra	1.49
Jun 99	GPU	GasNet	1.72
Mar 99	Envestra/Boral	Stratus Networks	1.99
Jan 99	Texas Utilities	Westar	1.86

Source: Grant Samuel & Associates Pty Limited, *Financial Services Guide and Independent Expert Report in relation to the Recapitalisation and Restructure of Babcock & Brown Infrastructure*, 9 October 2009, p. 78 and Grant Samuel & Associates Pty Limited, *Independent Expert Report in relation to the Acquisition of the Alinta Assets*, 5 November 2007, p. 65.

The AER considers that the acquisition premiums have been substantial, and that premiums of this magnitude are unlikely to be explained by factors associated with the sale process.[7] This suggests that the regulated cost of capital has been at least as high as the actual cost of capital faced by the businesses, and most likely has been in excess of the actual cost of capital. Market transactions therefore do not support the

[7] Such as expected synergies arising from the sale or misjudgment of the true value of the business. AER, *Draft decision, Envestra Ltd access arrangement proposal for the Qld gas network, 1 July 2011–30 June 2016*, 17 February 2011, p. 56.

view that regulated rates of return result in under compensation with respect to actual required rates of return. The AER considers that the implied premium it calculated on the sale of Country Energy's gas network in October 2010 is sound, given that it was based on sale details in the official ASX announcement by Envestra.

Trading multiples

Trading multiples for listed businesses operating regulated networks have also exceeded the value of the regulated asset base by between 15 and 81 per cent, as evident in table 5.5.[8]

Table 5.5: RAB multiples of regulated assets using recent market data

Entity	Average RAB as at 30 June 2009	Average RAB as at 30 June 2010
SP AusNet	1.50	1.40
Spark	1.81	1.73
DUET	1.21	1.15
Envestra	1.28	1.21

Source: Grant Samuel & Associates Pty Limited, *Financial Services Guide and Independent Expert Report in relation to the Recapitalisation and Restructure of Babcock & Brown Infrastructure*, 9 October 2009, p. 77. Based on share prices at 29 September 2009 and average nominal RAB for relevant year. RAB is based on the respective regulatory determinations except for DUET which allows for the $908 million expenditure on the Stage 5A and 5B expansion of the Dampier to Bunbury Natural Gas Pipeline.

The AER considers that the trading premiums have been substantial and that premiums of this magnitude are unlikely to be explained by other factors alone.[9] This suggests that the regulated cost of capital has been at least as high as the actual cost of capital faced by the businesses, and most likely has been in excess of the actual cost of capital.

Other assessments

The AER has evaluated a number of other techniques for assessing the overall rate of return raised in the revised proposal—specifically, dividend yields, relative debt returns, credit rating metrics and the Modigliani-Miller theorem. The AER considers that:

- projections based on dividend yields produce such a broad range of results that they do not provide any meaningful conclusion

8 Grant Samuel & Associates Pty Limited, *Financial Services Guide and Independent Expert Report in relation to the Recapitalisation and Restructure of Babcock & Brown Infrastructure*, 9 October 2009, p. 77; AER, *Draft decision, Envestra Ltd access arrangement proposal for the Qld gas network, 1 July 2011–30 June 2016*, 17 February 2011, p. 237.

9 Such as differences in tax structure, gearing or growth options. AER, *Draft decision, Envestra Ltd access arrangement proposal for the Qld gas network, 1 July 2011–30 June 2016*, 17 February 2011, p. 56.

- analysis of relative returns to debt and equity produces only an absolute lower bound for the cost of equity, which the rate of return established by the AER satisfies

- setting the rate of return to meet credit rating metrics is conceptually invalid, since credit rating agencies rely on both qualitative factors and quantitative ratios

- the Modigliani-Miller theorem, while conceptually sound, faces limitations in terms of simplifying assumptions that prevent its use in estimating a 'real world' rate of return.

Most importantly, none of these analyses indicate that the overall rate of return set by the AER would not allow Envestra the opportunity to recover at least its efficient costs incurred in providing reference services.

Conclusion

The AER considers that the analyses of market data support the conclusion that the rate of return established by the AER is commensurate with the prevailing conditions in the market for funds and the risks involved in providing reference services.[10] The rate of return determined in this decision is at least sufficient to meet the cost of capital faced by regulated service providers.[11]

5.3.2 Cost of equity models

The cost of equity (or return on equity) is defined as the expected return required to compensate investors for the time value of money and the risk associated with the equity investment. In estimating a firm's cost of equity it is usual regulatory and corporate financial practice to apply the capital asset pricing model (CAPM).

The AER's draft decision rejected the Envestra multi-model approach to estimate the cost of equity.[12] Consistent with r. 87(2) of the NGR, the AER used the CAPM to estimate the cost of equity.

Envestra did not accept the AER's draft decision.[13] In its revised proposal Envestra stated that it used the CAPM, and cross–checked this result against alternative asset pricing models and market based yield estimates.[14] Of the various models and methods included in the original proposal,[15] Envestra revised the cost of equity

10 NGR, r. 87(1).
11 NGL, s. 24(2)(a).
12 AER, *Draft decision, Envestra Ltd access arrangement proposal for the Qld gas network, 1 July 2011–30 June 2016*, 17 February 2011, pp. 65–76.
13 Envestra, *Revised Access Arrangement Information, Attachment 9–10: Other Rate of Return Issues*, 23 March 2011, p. 2 (section 9.4)
14 Envestra, *Revised Access Arrangement Information, Attachment 9-13: Proposed Rate of Return*, 23 March 2011, p. 1.
15 Although the Envestra QLD AAI is titled 'as revised on 23 March 2011', the rate of return chapter is identical to that submitted on 1 October 2010 (and so includes the 13.02 per cent figure). Attachments to the main document contain new information on the rate of return (including the 12.0 per cent figure); but there is no indication that Envestra sought to synthesise these with the main document. In its introduction to the AAI, Envestra stated that these attachments 'supersede, to the extent of any conflict' with the main document. However, there remains ambiguity about exactly which sections of the main document do not conflict with the content of the attachments. Envestra, *Revised Access Arrangement Information*, 23 March 2011, p. 10, 154; and Envestra,

estimates produced by the dividend growth model (DGM) and the 'market-based assessment' using dividend yields.[16]

The AER accepts the use of the (standard) CAPM as the primary determinant of the cost of equity, in accordance with r. 87(2)(b) of the NGR. However, the AER does not accept Envestra's proposal since various models and methods that are not well accepted financial models are used to outweigh the results of the CAPM. Most importantly, the AER rejects Envestra's proposal to use the Black CAPM, including the use of a de–facto Black CAPM by adjusting the standard CAPM for 'low beta bias', since the Black CAPM is not a well accepted financial model.

The AER maintains its position from the draft decision and estimates the cost of equity to be 10.36 per cent using the CAPM, in accordance with r. 87(2) of the NGR. This includes bottom-up consideration of the parameter inputs for the CAPM and top-down consideration of the overall cost of equity (and overall rate of return) that results from the use of the CAPM.[17] The AER does not apply the CAPM in a mechanistic manner, and has appropriately tested the inputs and outputs against available market data.

The AER's detailed consideration of cost of equity models is included in appendix A and is summarised in the following sections. This analysis engages with several important questions regarding the choice of cost of equity models, in particular whether Envestra's approach uses a well accepted financial model, whether the (standard) CAPM used by the AER is biased and whether the alternative Black CAPM is better.

Is the Envestra multiple-model approach well accepted?

There remains considerable ambiguity in the Envestra revised proposal about the relative weight given to the CAPM or to the alternatives put forward by Envestra (three models and two methods).[18] In accordance with r. 87(2)(b) of the NGR, the CAPM is a well accepted financial model for the purposes of determining the cost of equity. However, to the extent that other models/methods play a substantive role in determining the cost of equity, it is relevant whether each is a 'well accepted financial model' as required under the NGR.

The AER considers that, in substance, the cost of equity proposed by Envestra is driven by the SFG 'market-based assessment' using dividend yields, rather than the CAPM.[19] Envestra has lowered its proposed cost of equity from 13.02 per cent to 12.0

Revised Access Arrangement Information, Attachment 9-13: Proposed Rate of Return, 23 March 2011, p. 1.

16 Envestra, *Revised Access Arrangement Information, Attachment 9–10: Other Rate of Return Issues,* 23 March 2011, p. 2 (section 9.4) and Envestra, *Revised Access Arrangement Information, Attachment 9–9: Response to AER Draft Decision on Market Risk Premium,* 23 March 2011, p. 5 (section 9.2.4).

17 Details of this consideration are included elsewhere in this chapter, including sections on overall rate of return, equity beta and the market risk premium.

18 The alternative models are the DGM, the Fama–French three–factor model and the Black CAPM. The methods are 'market-based assessment' using dividend yields and cash flow analysis to meet credit rating metrics.

19 SFG, *The required return on equity commensurate with prevailing conditions in the market for funds: Response to draft decision: Report prepared for Envestra,* 23 March 2011, pp. 5-13.

per cent, in keeping with the revised SFG estimate.[20] Envestra does provide a 'CAPM' derivation of the 12.0 per cent estimate for the cost of equity, but this derivation is after adjusting the CAPM input parameters to eliminate the purported 'low beta bias'.[21] The AER considers that the 'low beta bias' adjustment is specifically designed to transform the (standard) CAPM into a de–facto Black CAPM. It is not clear from the information presented what weight has been given to the other models or method proposed by Envestra.

The revised proposal presents no further evidence on the acceptance of any of these alternative models/methods, or on the acceptance of the overall multiple-model approach employed by Envestra. The AER therefore confirms its draft decision that:

- the Black CAPM and Fama–French three–factor model (FFM) are not well accepted, since there is no evidence that these models are used by any of the relevant groups, namely regulators, academics and market practitioners[22]

- the DGM is not well accepted for use in the Australian context, since there are no reliable Australian inputs for the model and no evidence that it is used by any of the relevant groups in Australia[23]

- the two methods (market assessment and cash flow analysis to meet credit rating metrics) are neither financial models nor well accepted

- the overarching multiple-model approach is not well accepted, since this primarily depends on the acceptance of the constituent models and these are not well accepted.[24]

Given the ambiguity in the Envestra proposal, it is not clear exactly how much weight has been given to each of the alternative models and methods. However, it is evident that various models and methods that are not well accepted financial models outweigh the use of the CAPM to estimate the cost of equity. Accordingly, the AER does not accept Envestra's proposed approach in respect of cost of equity models.

Is the CAPM biased?

The AER considers that there is no reasonable basis to conclude that the standard CAPM implemented by the AER results in a bias. The AER acknowledges that the classical tests of the CAPM (following the 1972 Black, Jensen and Scholes paradigm) find that the realised return on shares with equity betas less than (more than) one is higher (lower) than that predicted by the CAPM.[25] However, any interpretation of this result must first have regard to the problems with testing the CAPM in this manner, including reliance on invalid proxies and inappropriate statistical procedures. The

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20 Envestra, *Revised Access Arrangement Information, Attachment 9-13: Proposed Rate of Return*, 23 March 2011, p. 1.

21 Envestra, *Revised Access Arrangement Information, Attachment 9-8: Response to AER draft decision on equity beta*, 23 March 2011, p. 2.

22 AER, *Draft decision*, February 2011, pp. 71.

23 AER, *Draft decision*, February 2011, pp. 71.

24 AER, *Draft decision*, February 2011, pp. 70.

25 This empirical result is labeled 'low beta bias' by Envestra and its consultants. Full references for the academic papers are included in appendix A.

AER considers that the empirical finding of 'low beta bias' plausibly arises from the flaws in this type of testing, rather than any deficiency in the CAPM.

Further, the AER uses input parameters (the risk free rate and market risk premium) that specifically counteract the purported 'low beta bias'. As noted by Professor Davis, the AER is using an 'implicit conditional CAPM' approach,[26] not the strict static CAPM criticised by Envestra.[27]

The AER considers that the CAPM remains the pre–eminent asset pricing model, and that it provides a reasonable basis from which to estimate the cost of equity, as is required by r. 74(2) of the NGR.

Is the Black CAPM a better alternative?

The AER does not consider that the Black CAPM provides a reasonable basis from which to estimate the cost of equity, because robust parameter inputs—specifically, the return on the zero beta portfolio—are not available. The AER considers that the zero beta returns presented by Envestra are highly variable and most likely unreliable. Although Envestra stated that, whatever its true value, the zero beta return must be above the risk free rate, this is not the case.[28] Envestra's consultant appears to indicate that the best estimate of the zero beta return is to set it equal to the risk free rate (and therefore that the standard CAPM is accurate).[29]

Conclusion

Overall, the AER considers that Envestra's approach in relation to cost of equity models does not meet the requirements of r. 87(2)(b) of the NGR. Further, estimates generated by the Envestra approach do not meet the requirements of r. 74(2) and r. 87(1) of the NGR. Most importantly, the cost of equity derived by Envestra appears to be well above the cost of equity that is required to be commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.

The AER instead uses the (standard) CAPM, which is a well accepted financial model, to estimate the cost of equity.[30] The AER considers that the use of the CAPM to estimate the cost of equity:

- complies with the applicable requirements of the NGL and the NGR
- is consistent with the revenue and pricing principles set out in section 24 of the NGL
- will or is likely to contribute to the achievement of the national gas objective (NGO) in section 23 of the NGL.

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26 Davis, *Cost of equity Issues: A report for the AER*, 16 January 2011, p. 9.
27 CEG, *WACC Estimation: A report for Envestra*, March 2011, pp. 3–10.
28 Davis, *Cost of equity issues: A further report for the AER*, 13 May 2011, pp. 4–10.
29 Grundy, *Comment on the cost of capital: A report for Envestra*, 23 March 2011, p. 10.
30 The AER has full discretion (as set out in r. 40(3) of the NGR) over determination of the rate of return to meet the requirements of r. 87 of the NGR. However, given that the Envestra proposal does not meet the requirements of r. 87 of the NGR, the AER is not required to expressly rely on r. 40(3) in electing to use the CAPM.

5.3.3 Equity beta

The equity beta provides a measure of the 'riskiness' of an asset's return compared with the return on the entire market. The equity beta reflects the exposure of the asset to systematic or 'non-diversifiable' risk, which is the only form of risk that requires compensation under the CAPM.

Consistent with the 2009 WACC review, the AER's draft decision considered that an equity beta of 0.8 would ensure that the service provider has the opportunity to recover at least its efficient costs incurred in providing reference services. As shown in table 5.6, the AER considers that CEG's equity beta estimates support the empirical findings in the WACC review of an equity beta range of 0.4 to 0.7 for Australian energy network businesses.[31]

Table 5.6: Equity beta estimates

Company	Equity beta
CEG estimates	
Envestra	0.51
Hastings	1.64
Australian Pipeline	0.54
DUET	0.34
Spark Infrastructure	0.53
SP AusNet	0.14
Simple average	**0.62**
AER WACC review range	**0.41 – 0.68**

Source: Competition Economist Group, *Estimating the cost of capital under the NGR, A report for Envestra*, September 2010, p. 49 and AER, *Final decision, Electricity transmission and distribution network service providers, Review of the weighted average cost of capital (WACC) parameters*, 1 May 2009, p. 343.

Envestra's revised proposal attached a report from CEG responding to the AER's draft decision on the equity beta. Envestra's revised proposal stated that the equity beta should be close to 1.0.

The AER rejects Envestra's revised proposal of an equity beta estimate close to 1.0 as it would result in a cost of capital which is excessive with respect to the risks involved in providing reference services. The AER maintains its position in the draft decision and considers that an equity beta of 0.8 provides the best estimate commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services, as required under r. 74(2) and r. 87(1) of the NGR.[32]

[31] AER, *WACC review final decision*, 1 May 2009, pp. xv–xviii, 239–292, 343–361.
[32] NGL, s. 24(2).

The AER's detailed consideration of the equity beta in relation to the matters raised in the revised proposal is included in appendix A, and is summarised below.

Use of Australian or US data

The key issue in the Envestra revised proposal is whether or not estimates of the equity beta generated using US data should be relied on instead of the estimates based on Australian data.

The adopted benchmark service provider is Australian and the AER sets the rate of return using a domestic CAPM. The AER considers that this provides a strong rationale for estimating all the CAPM inputs (such as the equity beta) using Australian data. The use of a foreign proxy is a suboptimal outcome that can only be justified where there is evidence that this will produce more reliable estimates of the domestic equity beta than the Australian estimates themselves. The onus remains on any party (in this case, Envestra and its consultant CEG) wishing to depart from the use of domestic data to establish that a foreign proxy will be more reliable.

Based on the evidence before it, the AER considers there is no reasonable basis to conclude that US data should be used in place of Australian data, or that US equity beta estimates will better compensate Australian regulated utilities. This is consistent with the AER's draft decision and the 2009 WACC review.

Australian estimates

The AER considers that robust Australian equity beta estimates support a range between 0.40 and 0.70. Analysis by Envestra's consultant, CEG, supports this range. The AER acknowledges that this is a relatively broad range, reflecting the uncertainty inherent in estimating this parameter. Moreover, by taking into account the need to achieve an outcome that is consistent with the NGO, revenue and pricing principles, and the importance of regulatory stability the AER applies an equity beta of 0.8, which is above the upper end of this range. Any contention that an equity beta set in this manner is under compensating the benchmark service provider is misplaced.

The AER considers that, even where Australian data is used, it is inappropriate to set the equity beta based on a relatively short time series during a period of unusual market activity, such as the GFC.[33] There is insufficient evidence to suggest long-term investors base their expectations of long-term returns on periods of high volatility alone. The AER considers that its approach to estimating equity betas has appropriately balanced the general trade-off between the potential loss in the relevance of observations and capturing sufficient observations to obtain statistically robust equity beta estimates (i.e. sample size of observations).

The AER has cross-checked this by obtaining a recent Grant Samuel independent report which used an equity beta estimate of 0.8 to 0.9, suggesting that the equity beta estimates for energy distribution businesses remained unchanged as a consequence of the GFC.[34]

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33 CEG, *WACC Estimation, A Report for Envestra*, March 2011, p. 11.

34 Grant Samuel, *Financial Service Guide and Independent Experts Report in relation to the Recapitalisation and Restructure of Babcock & Brown Infrastructure*, 9 October 2009, Appendix 1, p. 8.

United States estimates

The AER considers that the sensitivity analysis of equity beta estimates from US regulated firms does not lead to the conclusion that the AER's Australian equity beta estimates should not be used. The AER acknowledges that estimates of equity beta might be affected by altering the estimation period, end of estimation period, sampling period (i.e. monthly vs. weekly or daily returns), or firms included within the sample.[35] The analysis conducted by CEG is on US data and the evident variability suggests that there is no advantage relative to using Australian data. Further, the AER considers that the CEG analysis makes arbitrary adjustments (such as omitting monthly estimates) and fails to report statistical tests of its results.

Evidence of a 'low beta bias' in returns relative to that predicted by the CAPM

The claims in Envestra's revised proposal of a 'low beta bias' based on the reports submitted by CEG and Professor Grundy have been considered by the AER in the context of assessing the cost of equity models in section 5.3.2.[36] The AER considers that there is no reasonable basis to conclude that the standard CAPM implemented by the AER results in a bias, and no reason to adjust the equity beta to be 'around 1.0' in this case.

Conclusion

The AER considers that the empirical evidence presented in the WACC review contains the best available estimate of the equity beta that would apply to a gas distribution network service provider, taking into account the need to reflect prevailing market conditions and the risks involved in providing reference services.[37] The sample set of data used to derive the equity beta in the WACC review provides a value for an equity beta of between 0.4 and 0.7.

The AER has given consideration to other factors, such as the need to achieve an outcome that is consistent with the NGO—in particular, the need for efficient investment in natural gas services for the long-term interests of consumers of natural gas. The AER has also taken into account the revenue and pricing principles, the importance of regulatory stability and is also mindful it has recently considered an equity beta of 0.8 to be appropriate, if not overstated, for other gas businesses. On the basis of the information presented, the AER concludes that an equity beta of 0.8 provides Envestra with an opportunity to recover at least its efficient costs incurred in providing reference services and meeting regulatory requirements.[38]

5.3.4 Market risk premium

The MRP is the expected return over the risk free rate that investors require to invest in a well diversified portfolio of risky assets.[39] The MRP represents the risk premium investors who invest in such a portfolio can expect to earn for bearing only non-

35 CEG, *WACC Estimation, A Report for Envestra*, March 2011, pp. 12–20.
36 CEG, *WACC Estimation, A Report for Envestra*, March 2011, pp. 3 – 5 and Bruce D. Grundy, *Comment on the Cost of Capital – A Report for Envestra*, 23 March 2011.
37 NGR, r. 74(2)(b) and r. 87(1).
38 NGL, s. 24(2).
39 All assets other than the risk free asset have the potential to provide a negative return and are therefore classified as risky assets.

diversifiable (systematic) risk. The MRP is common to all assets in the economy and is not specific to an individual asset or business.

The MRP is not observable because it is a forward looking value. In addition to this, the available evidence that can be used to estimate the MRP is imprecise and subject to varied interpretation, a point that is well recognised in academic literature[40] as well as in reports put forward by regulated entities.[41] As a result, a degree of judgment is required to determine the MRP value that is the best estimate in the circumstances and commensurate with prevailing conditions in the market for funds.

In the draft decision, the AER did not accept Envestra's original proposal for an MRP of between 6.5 and 8 per cent. The AER adopted an MRP of 6 per cent for the purposes of determining the cost of equity using the CAPM. An MRP of 6 per cent was consistently adopted in regulatory decisions prior to the AER's WACC review, including at times when indications were that the MRP was below 6 per cent.[42] At the time of the WACC review the acknowledged the uncertainty in the market due to the onset of the GFC. The AER considered one of two scenarios could have explained market conditions at that time:

- The prevailing medium-term MRP was above the long-term MRP, but would return to the long-term MRP over time; or

- There had been a structural break in the MRP and the forward looking long-term MRP (and consequently also the prevailing) MRP is above the long-term MRP that previously prevailed.

Due to the uncertainty about the effects of the GFC on future market conditions the AER departed from the previously adopted forward looking MRP estimate of 6 per cent and increased it to 6.5 per cent The significant uncertainty that characterised markets at the time of the WACC review has substantially diminished. The prevailing conditions in the market for funds have eased.

The AER considers that the appropriate approach is to assess a range of evidence to inform the best estimate of the MRP. In applying its judgement, the AER has considered the following available evidence:

- Historical excess return estimates for three time periods, 1883–2010, 1937–2010 and 1958–2010. These estimates provide a range of 5.9–6.4 per cent if calculated on an arithmetic mean basis and a range of 3.8–4.8 per cent if calculated on a geometric mean basis.[43] These figures estimate the realised return that stocks have

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40 See for example Mehra R. and Prescott E.C., 'The equity premium, A puzzle', *Journal of Monetary Economics*, 15, 1985, pp. 145–161; Damodoran A., *Equity Risk Premiums (ERP), Determinants, Estimation and Implications*, September 2008, p. 1; Doran J.S., Ronn E.I. and Goldberg R.S., *A simple model for time-varying expected returns on the S&P 500 Index*, August 2005, pp. 2–3.

41 See for example Officer and Bishop, *Market risk premium, a review paper*, August 2008, pp. 3–4.

42 AER, *Draft decision, Envestra Ltd access arrangement proposal for the Qld gas network*, February 2011, pp. 72–74.

43 These estimates assume a theta value of 0.35, consistent with the theta value assumed in calculating the cost of corporate income tax. Handley, *Memorandum: Additional Estimates of the Historical Equity Risk Premium for the Period 1883 to 2010*, 25 May 2011, p. 1.

earned in excess of the 10-year government bond rate and may inform expectations of the excess return that could be earned in the future.

- DGM based estimates of the MRP incorporating reasonable assumptions provide an estimated range for the MRP of approximately 4.5–5.6 per cent. DGM based estimates of the MRP are highly sensitive to the assumptions made so it is best to consider DGM based estimates of the MRP along with a range of other evidence.

- Implied volatility from the prices of options on the ASX 200 index has returned to pre-GFC levels, which indicates that the MRP is unlikely to be above pre-GFC levels. However, the AER is not aware of a reliable basis for directly estimating the MRP from implied volatility, especially for a long term horizon.

- Surveys of market practitioners prior to the GFC supported 6 per cent as the most commonly adopted value for the MRP. These surveys also indicated that the average MRP adopted by market practitioners was approximately 6 per cent. The latest survey evidence from 2009 and 2010 supports an MRP of approximately 6 per cent. However, the latest evidence is based on a limited number of respondents.

- Recent evidence from broker reports indicates that current market practice is to adopt an MRP estimate of approximately 6 per cent on average and a recent report from AMP Capital Investors indicates that its forward looking MRP is lower than 6 per cent.

The AER considers the evidence outlined above supports an MRP of 6 per cent as the best estimate of the MRP. It also indicates that the AER's approach of increasing the MRP to 6.5 per cent at the time of the WACC review is no longer appropriate. The AER's detailed consideration of the evidence is contained in appendix A.

Envestra submitted a number of specific issues for the AER's consideration. In a late submission to the AER, SP AusNet and Multinet Gas also raised a number of issues for the AER's consideration. The AER has assessed the available information, including the issues raised by Envestra, SP AusNet and Multinet Gas, and does not consider that an MRP above 6 per cent is justified. The AER's consideration of the information provided by Envestra, SP AusNet and Multinet Gas is summarised below, with further details contained in appendix A:

- VAA stated that an MRP estimate of 8 per cent is reasonable based on its implied volatility and 'glide path' approach.[44] However, the AER has concerns about the use of option implied volatility to directly estimate the forward looking MRP as well as the use of the 'glide path' approach, which are outlined in appendix A. Furthermore, VAA has previously stated that it is appropriate to use an alternative approach to adopting a long-term estimate (such as an implied volatility and 'glide-path' approach) when volatility levels are abnormal.[45] Implied volatility levels have returned to pre-GFC levels[46] and the latest long-term historical

[44] VAA, *Market risk premium, comments on the AER draft distribution determination for the Victorian electricity distribution network service providers*, July 2010, p. 2.
[45] VAA, *Market risk premium, estimate for January 2010–June 2014*, December 2009, p. 1.
[46] The current level of implied volatility is presented and discussed in detail in appendix A.

estimates of the MRP are in the range 5.9–6.4 per cent.[47] The AER does not consider it appropriate to accept an MRP estimate of 8 per cent based on VAA's implied volatility and 'glide path' approach.

- CEG suggested a reasonable estimate of the MRP is 7.4 per cent based on its DGM analysis, which incorporated dividends yield forecasts for Australian utility businesses of 7–10 per cent. However, the AER notes that the MRP is not firm or industry specific and the average dividend yield across the Australian market is around 4 per cent.[48] If CEG's analysis is adjusted to incorporate more reasonable market wide assumptions, the MRP estimated from its model is in the range of 4.5–5.6 per cent.

- Capital Research (CR) submitted that an MRP in the range 6.6–7.5 per cent is reasonable based on its DGM analysis. CR assumed a perpetual growth rate of approximately 8.12 per cent. However, the AER considers a growth rate of 8.12 per cent is greater than combined long-term estimates of GDP and inflation, which is logically impossible. The stock market cannot grow at a rate greater than the entire economy into perpetuity otherwise the stock market would become larger than the aggregate economy of which it is just one sector. Therefore, CR's MRP estimates are likely to be overstated.

The economic and financial markets outlook for Australia is robust as noted in statements by the Reserve Bank of Australia (RBA), the International Monetary Fund (IMF) and the Organisation for Economic Co-operation and Development (OECD). This is likely to be factored into investors' expectations of future equity market returns and therefore the MRP required by investors.

The MRP is likely to change over time based on prevailing market conditions. At times the short-term MRP may be lower than long run estimates and at times it may be higher. To maintain regulatory consistency and certainty, the AER considers the best approach is to consider a long-term MRP, with a notional 10 year investment horizon consistent with the term of the risk free rate. Based on the available evidence outlined above the AER considers the best estimate of the MRP for the purposes of this access arrangement review is 6 per cent.

In conclusion, the AER considers that available evidence on the MRP is imprecise and as a result the MRP is subject to a margin of variation. The AER has used its judgment to interpret the information before it and considers that the available evidence, both prior to and following the GFC, supports 6 per cent as the best estimate of the forward looking MRP arrived at on a reasonable basis. The AER considers that an MRP within the range of 6.5 to 8 per cent proposed by Envestra is excessive based on the available evidence and is not consistent with the requirement that the rate of return be commensurate with prevailing conditions in the market for funds.[49]

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47 This is based on arithmetic means and a theta value of 0.35.

48 Average dividend yields estimated from the MSCI Australia index for 2005–2011 as reported in RBA statistical tables, Table F.7 – share market, available at http://www.rba.gov.au/statistics/tables/pdf/f07.pdf, viewed 13 May 2011.

49 NGR, r. 87(1).

The AER also considers that an MRP of 6 per cent is consistent with the revenue and pricing principles set out in section 24(2)(a) of the NGL. These state that the service provider should be provided with a reasonable opportunity to recover at least the efficient costs. The MRP of 6 per cent best meets the NGO, which 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.

5.3.5 Debt risk premium

The DRP is the margin above the nominal risk free rate that a debt holder would require in order for it to invest in a benchmark efficient firm. When combined with the nominal risk free rate, the DRP represents the return on debt and is an input for calculating the WACC.

The AER's draft decision rejected Envestra's proposed approach to establishing the DRP. Instead, the AER determined the DRP based on an average of Bloomberg's BBB fair value estimates (extrapolated to a maturity of 10 years) and the observed yields on the APA Group bond.

Envestra did not agree with the AER's approach and its revised proposal determined the DRP based solely on Bloomberg's fair value estimates.[50] Using a 10 day averaging period commencing 25 February 2011, this approach provided a DRP of 467 basis points above the risk free rate.[51]

The AER considers that the DRP proposed by Envestra is excessive and not commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services. Further, the AER considers that the proposed DRP is not consistent with section 24 of the NGL, in so much as the estimate of the benchmark cost of debt has insufficient regard to:

- the regulatory and commercial risks involved in providing the reference service (section 24(5))
- the economic costs and risks of the potential for under and over investment (section 24(6)).

As detailed in appendix A, the AER considers that the evidence in support of the observed yields of the APA Group bond has strengthened significantly since the draft decision. Specifically, observed yields for an additional four bonds with similar terms to maturity and credit ratings as the benchmark corporate bond have become available. These observed yields all support the AER's consideration that the observed yields of the APA Group bond are more reflective of prevailing conditions in the market for funds for the AER's notional benchmark service provider than Bloomberg's (extrapolated) 10 year, BBB fair value estimates.

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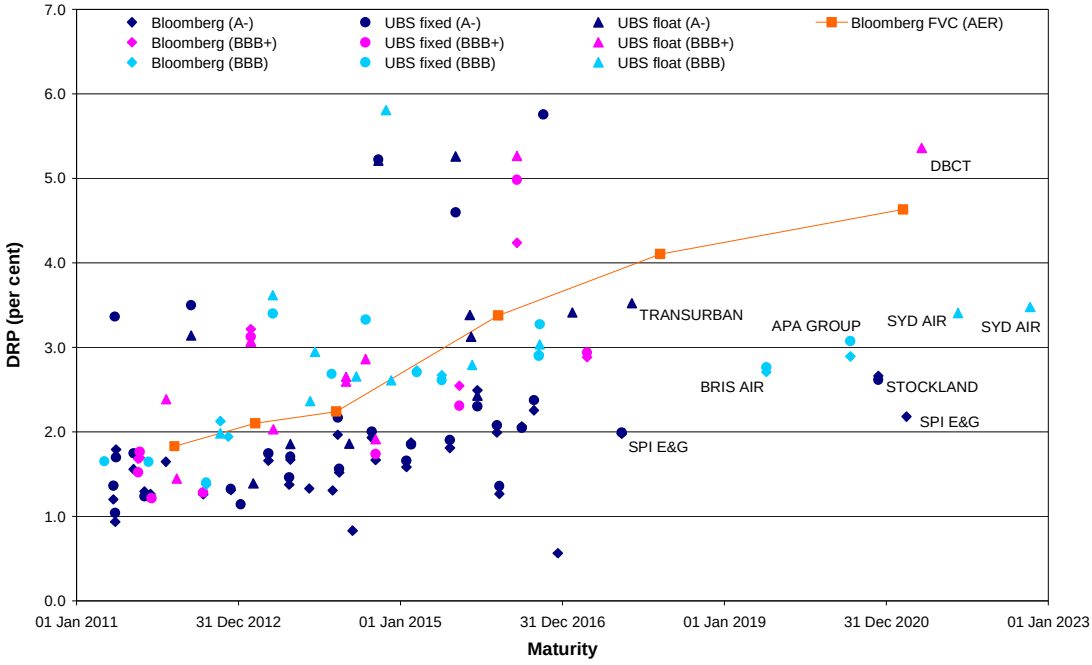
50 Envestra, *Revised access arrangement information, Attachment 9-7 – Response to AER draft decision on debt risk premium*, March 2011.

51 For the reasons discussed in section 5.3.6, the AER has approved a 15 day averaging period.

Further, as figure 5.1 demonstrates, the additional empirical evidence also suggests that Bloomberg's (extrapolated) 10 year, BBB rated fair value estimate is likely to overstate the costs of debt, particularly for regulated network service providers.

Figure 5.1 Australian corporate bonds with credit ratings ranging from BBB to A–



Source: Bloomberg, UBS, AER analysis.

Note: Yields are annualised, and floating bonds have been converted to fixed rate equivalents. No other adjustments have been made.
Observed yields for the Brisbane Airport and SP AusNet bonds only became available from 28 and 30 March 2011 respectively. As such, references throughout this chapter to the observed yields of the Brisbane Airport and SP AusNet bonds reflect average yields over the period from 1 April 2011 to 31 May 2011. Although these dates are not in Envestra's averaging period, the AER considers these bonds provide relevant information in setting the benchmark DRP.

On this basis, the AER does not consider it appropriate to set the DRP based solely on the (extrapolated) Bloomberg fair value estimate. The AER considers that greater reliance could reasonably be placed on the APA Group bond to determine the DRP. However, in the current circumstances, the AER considers that some uncertainty exists regarding the appropriateness of setting the DRP based upon a single bond yield. Accordingly, the AER has exercised its judgment to determine the proportion to apply to both data sources.

The proportion to apply to each data source should reflect their relative suitability for the purposes of establishing a benchmark DRP. The AER considered increasing the emphasis on the APA Group bond relative to the Bloomberg fair value curve, in view of the increased support for the APA Group bond since the draft decision. However, after careful evaluation, the AER considers there are currently insufficient grounds to justify departure from the position in the draft decision. The AER considers that a

DRP based equally on the observed yields of the APA Group bond and Bloomberg's fair value estimates would satisfy the requirements of the NGR.[52]

Based on the 15 day averaging period commencing 25 February 2011, these two information sources produce margins over the risk free rate of 4.63 per cent and 2.98 per cent.[53] This results in a DRP of 3.81 per cent (effective annual compounding rate). The AER considers this is the best DRP estimate possible in the circumstances of Envestra.

The AER has reached this conclusion for the following reasons:[54]

- There is evidence to suggest that the behaviour of the Bloomberg fair value estimates since the onset of the GFC is somewhat counterintuitive. The extrapolated 10 year DRP derived from Bloomberg is currently nearing all time highs. The spread between Bloomberg's seven and 10 year, AAA rated fair value estimates—which is used by the AER to extrapolate Bloomberg's seven year, BBB rated fair value estimates—also remains at near historical highs. This implies that prevailing conditions in debt markets are more risky now than during the GFC. This is counterintuitive, as substantial evidence indicates that debt market conditions have improved significantly.

- The characteristics of the APA Group bond closely match those of the benchmark corporate bond adopted by the AER, namely its BBB credit rating and near 10 year maturity. As this bond has a lower credit rating than the BBB+ benchmark, its use would be expected to result in a DRP that overstates the benchmark cost of debt.

- The APA Group is an owner of various largely regulated energy network assets. The nature of the underlying risk and markets in which the APA Group operates resembles those of the benchmark gas pipeline service provider. To the extent that credit ratings are an imperfect indicator of default risk, the APA Group bond is suitable for deriving a DRP that reflects the risks involved in providing reference services.

- A recently issued A– rated, 10 year bond by SP AusNet has observed yields that are below the APA Group bond. Similarly, the A– rated, 10 year bond issued by Stockland has a yield comparable to the APA Group bond.[55] Notably, both yields

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52 This decision contrasts from the most recent final decision of the AER. That decision—for the Victorian electricity distribution businesses—determined the DRP based on a 75 per cent weighting to estimates from Bloomberg and a 25 per cent weighting to estimates from the APA Group bond. The AER also notes that the Victorian final decision is currently the subject of a merits review before the Australian Competition Tribunal.

53 The margin over the risk free rate for the APA Group bond reflects an equally weighted average of the observed yields from Bloomberg and UBS.

54 The AER is concurrently reviewing access arrangement proposals for Envestra's gas distribution businesses in Queensland and South Australia, as well as for APT Allgas's gas distribution business in Queensland. Where relevant, the AER has considered all proposals.

55 The AER considers that the Stockland bond provides a relevant point of reference to assess the reasonableness of both Bloomberg's BBB rated fair value estimates and the APA Group bond yield, albeit to a lesser extent than the Brisbane Airport, Sydney Airport and SP AusNet bonds (given the nature of its operations differ from the AER's notional benchmark service provider). This is discussed in detail in section A.5.3 of this final decision.

are significantly below the extrapolated 10 year, BBB rated Bloomberg estimates, and give further support for relying on the APA Group bond instead of only the Bloomberg estimates.

- A recently issued BBB rated, eight year bond by Brisbane Airport has observed yields that are approximately 20 basis points below the APA Group bond and over 172 basis points below Bloomberg's fair value estimates. This also provides support for relying on the APA Group bond instead of only the Bloomberg estimates.

- The BBB rated, Sydney Airport floating rate bonds maturing in 2021 and 2022 respectively, currently exhibit observed yields approximately 130 and 110 basis points below Bloomberg's 10 year, BBB rated fair value estimates.

- The Independent Pricing and Regulatory Tribunal (IPART) recently published its final decision for a discussion paper to develop an approach to setting the debt margin.[56] The indicative debt margin was more than 170 basis points below Envestra's proposal. Although the methods used by IPART and the AER differ—notably, IPART has considered shorter term debt—the outcome of IPART's decision suggests that Envestra's proposed DRP is excessive and not commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.[57] The Economic Regulation Authority (ERA) has also recently published a draft decision with indicative debt margins more than 150 basis points below Envestra's proposal.[58]

- As part of the assessment of Envestra's access arrangement proposal, the AER requested and received actual costs of debt data from Envestra. This information supports that the AER's estimate of the DRP provides a reasonable opportunity for Envestra to recover at least its efficient costs.[59]

5.3.6 Averaging period and the risk free rate

The risk free rate measures the return an investor would expect from an asset with zero volatility and zero default risk. The yield on long-term Commonwealth Government Securities (CGS) is often used as a proxy for the risk free rate because the risk of government default on interest and debt repayments is considered to be low.[60]

In its original access arrangement proposal Envestra did not propose an averaging period, which is a necessary component for the determination of the rate of return as required by r. 87 of the NGR. Therefore, in its draft decision the AER rejected Envestra's proposal and requested it to nominate an averaging period no later than the

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56 IPART, *Developing the approach to estimating the debt margin, Other industries*, Final decision April 2011.

57 NGR, r. 87(1).

58 ERA, *Draft decision on proposed revisions to the access arrangement for the Dampier to Bunbury natural gas pipeline*, March 2011, p. 168.

59 NGL, s. 24(2).

60 AER, *Final decision: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters*, 1 May 2009, pp. 128–174 (AER, *Final decision: WACC Review*, 1 May 2009).

lodgement of its revised access arrangement proposal. The AER's draft decision also set out the following criteria based on the requirements of r. 87(1) of the NGR:

1. The averaging period should be nominated in advance of the commencement of the period and should not include a date in the past.
2. The averaging period should be between 10 and 40 business days in length.[61]

On 24 February 2011 Envestra advised the AER that it wished to nominate 15 business days commencing on 25 February 2011 as the averaging period to apply to the access arrangement period.[62]

Subsequently, on 16 March 2011 Envestra notified the AER that it wished to shorten the nominated averaging period from 15 to 10 business days ending 10 March 2011.[63] Envestra stated that the reason for this adjustment is to exclude the adverse impact of the Japan earthquake on the global capital market.[64] In particular, Envestra stated that the shortened averaging period excludes the abnormal steep reduction in observed yields on the 10 year CGS following the event in Japan.[65]

The AER does not consider the averaging period proposed by Envestra on 16 March 2011 to be appropriate as it includes a change that applies to dates in the past. Instead, the AER considers the averaging period proposed by Envestra on 24 February meets the requirements of r. 87(1) of the NGR. The AER has reached this conclusion for the following reasons:

- The AER does not consider it is reasonable to vary a nominated averaging period after its commencement. This is because the resultant averaging period contains a date in the past. As stated in the draft decision, the reason for not allowing the nominated averaging period to include a date in the past is to prevent gaming of the regulatory regime by deliberately selecting an averaging period with a higher risk free rate. By the time Envestra informed the AER of its proposal to amend the nominated averaging period by reducing the length to 10 business days on 16 March 2011, the date of the averaging period had already concluded (10 March 2011). The AER considers that the retrospective change to the averaging period, as proposed by Envestra, is not consistent with the requirement of r. 87(1) of the NGR.

- In the context of reducing the length of days of the proposed averaging period as a result of the Japan earthquake, the AER does not consider this to be necessary. Although the annualised 10 year CGS yield declined for 6 consecutive trading days immediately after the Japan earthquake by a cumulative amount of 11 basis points, it was not an aberration that required an adjustment to the proposed averaging period. First, this level of variation in the 10 year CGS yields from 10 March 2011 to 18 March 2011 is not inconsistent with other movements observed from 4 January 2011 to 10 March 2011.

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61 AER, *Draft decision*, February 2011, p. 89.
62 Envestra E-mail to the AER, *Response Period and Averaging Period, attachment 110224-Averaging Period.pdf*, 24 February 2011.
63 Envestra E-mail to the AER, *Averaging period* 16 March 2011.
64 The earthquake occurred in Japan on 11 March 2011.
65 Envestra, *Revised Qld access arrangement information*, attachment 9-6, March 2011, pp. 1–2.

- Table 5.7 shows periods from 4 January 2011 to 18 March 2011 (a total of 53 trading days) where the annualised 10 year CGS yield experienced consecutive days of declines or increases, with the overall movement greater than 11 basis points. Second, by reducing the length of the proposed averaging period by 5 days, the resulting risk free rate is estimated to be 5 basis points lower than the risk free rate determined over the full 15 day averaging period. This level of variation cannot be reasonably considered as an aberration that requires adjustment to the proposed averaging period.

Table 5.7: Annualised 10 year CGS yields

Period	Numbers of trading days	Cumulative movement in annualised CGS yields (basis points)
From 21 January 2011 to 28 January 2011	5	–16
From 31 January 2011 to 9 February 2011	8	+24
From 16 February 2011 to 23 February 2011	6	–15
From 10 March to 18 March 2011	7	–11

Source: RBA, *F16 Indicative mid range selected commonwealth government securities*, accessed from http://www.rba.gov.au/statistics/tables/xls/f16.xls?accessed=0305-09:45:26; AER analysis.

Using the averaging period of 15 business days commencing 25 February 2011 the AER determines a risk free rate of 5.56 per cent (effective annual compounding rate) for this decision.

5.3.7 Gearing ratio

The gearing ratio is defined as the ratio of the value of debt to total capital—that is, debt and equity—and is used to weight the costs of debt and equity when formulating the WACC.

The AER's draft decision considered that a gearing ratio of 60 per cent is appropriate for the benchmark efficient gas distribution business.[66] Envestra accepted the AER's draft decision.[67]

5.3.8 Inflation forecast

The expected inflation rate is not an explicit parameter within the WACC calculation. However, it is used in the revenue model to forecast nominal allowed revenues and to index the capital base. It is an implicit component of the nominal risk free rate, with implications for the return on both equity and debt. The inflation forecast is established consistent with the ten year investment horizon of the risk free rate.

In the draft decision, the AER determined an average forecast inflation rate over a ten year period of 2.52 per cent based on the method of applying the RBA's short-term inflation forecasts extending out for two years and the mid-point of the RBA's target inflation band—that is, 2.5 per cent—for the remaining eight years.[68] The average 10

66 AER, *Draft decision*, February 2011, pp. 89–90.
67 Envestra, *Revised Qld access arrangement information*, attachment 9-10, March 2011, p. 1.
68 It should be noted that the AER has previously used a market-based inflation forecast derived by taking the difference between indexed and nominal Commonwealth Government Security (CGS) yields. The AER notes the resumption of issuance of Treasury Indexed Bonds by the Australian

year forecast is calculated by taking the geometric average of these annual inflation forecasts for each year.[69] Envestra accepted the AER's draft decision.[70]

As noted in the draft decision, inflation forecasts can change in line with market sensitive data and regulatory practice in Australia has been to update these forecast values at the time of making a decision. For this decision, the AER has updated the inflation forecast based on the latest RBA expectations as set out in table 5.8. The average forecast inflation rate over a ten year period is 2.55 per cent.

Table 5.8: AER inflation rate forecast (per cent)

	Jun-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20	Jun-21	Geometric average
AER inflation forecast	2.50	3.00	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.55

Source: RBA, *Statement on monetary policy*, 6 May 2011, p. 63.

5.4 Conclusion

The AER proposes not to approve the rate of return proposed by Envestra as it does not comply with r. 87 of the NGR and requires Envestra to make the revisions set out in section 5.5.

5.5 Revisions

The AER proposes the following revision:

Revision 5.1: make all amendments necessary in the revised access arrangement proposal and access arrangement information to take account of the rate of return determined in accordance with table 5.9.

Table 5.9: WACC parameters for the access arrangement period

Parameter	
Nominal risk free rate (%)	5.56
Inflation (%)	2.55
Equity beta	0.80
Market risk premium (%)	6.00
Debt risk premium (%)	3.81
Gearing (%)	60.00
Cost of debt (%)	9.37
Cost of equity (%)	10.36
Nominal vanilla WACC (%)	**9.77**

Office of Financial Management in October 2009. The AER will closely monitor developments in capital markets to determine the effect of this new issuance on the relative demand and supply for indexed CGS.

69 AER, *Draft decision*, February 2011, pp. 87–88.

70 Envestra, *Revised Qld access arrangement information*, attachment 9-10, March 2011, p. 1.

6 Taxation

The AER's draft decision accepted Envestra's adoption of a post-tax approach to determining revenues. The AER's also accepted the way that taxation was to be calculated (including the use of 30 per cent corporate tax rate), the opening tax asset base as at 1 July 2011, and the tax asset lives proposed by Envestra. However, the AER rejected Envestra's estimate of the use of imputation credits by investors (gamma) of 0.2. Based on the available evidence, the AER considered the best estimate of gamma was 0.45.

In response to the draft decision, Envestra disagreed with the AER's estimate of gamma of 0.45. Envestra proposes a gamma of 0.2. Envestra requested that the tax allowance be revised to reflect changes to gamma, the roll forward of the capital base and other building block components.

The AER found error with Envestra's calculation of forecast tax allowance due to a transcription error in relation to Envestra's proposed value for gamma.[1] This understated the value of imputation credits and therefore overstated Envestra's tax allowance.

The AER has applied a gamma of 0.25, consistent with the recent Australian Competition Tribunal decision in its review of the AER's electricity distribution determinations for Queensland and South Australia.

The AER calculated a forecast tax allowance of $12 million for the access arrangement period. This forecast reflects the revised revenues and cost figures presented in the various chapters of this final decision.

6.1 Regulatory requirements

Rule 72(1)(h) of the NGR provides that the access arrangement information for an access arrangement proposal must include the proposed method for dealing with taxation, and a demonstration of how the allowance for taxation is calculated.

Rule 76(c) of the NGR provides for the estimated cost of corporate taxation as a building block for total revenue insofar as this is applicable.

6.2 Revised access arrangement proposal

6.2.1 Use of imputation credits (gamma)

Envestra did not accept the AER's draft decision to adopt a gamma estimate of 0.45. Envestra maintained that a gamma value of 0.2 is appropriate in its revised access arrangement proposal.[2] In letters dated 4 May 2011 and 17 May 2011, Envestra submitted that the value of gamma should be 0.25 in accordance with indications made by the Australian Competition Tribunal (Tribunal) in relation to its review of

1 Envestra entered the proposed gamma value of 0.2 as 0.002, instead of 0.2.

2 Envestra, *Revised access arrangement information, Attachment 9-11: Value of imputation credits*, March 2011, pp. 1–5.

the AER's electricity distribution determinations for Energex, Ergon Energy and ETSA Utilities.[3]

6.2.2 Forecast tax allowance

The AER's draft decision required that amendments be made to Envestra's original proposal including changes to cost of capital, forecast capital and operating expenditure forecasts, and the opening capital base.

Envestra's proposed tax allowance has been amended to reflect its revised proposal. The revised proposal includes revisions to various building block components including:

- cost of capital
- forecast capital expenditure
- forecast operating expenditure.

Envestra has recalculated the forecast tax allowance based upon these changes that affected its proposed revenues/expenditures, including the proposed value for gamma. Envestra's proposed forecast tax allowance for the access arrangement period is shown in table 6.1.

Table 6.1: Envestra's tax allowance for the access arrangement period ($m, nominal)

	2011–12	2012–13	2013–14	2014–15	2015–16
Tax payable	4.8	4.8	4.7	4.4	4.5
Less value of imputation credits	0.0	0.0	0.0	0.0	0.0
Tax	4.7	4.8	4.7	4.4	4.5

Source: Envestra Qld, *Access arrangement revised submission* (Attachment 12–4), March 2011, p. 1.

6.3 AER's consideration

6.3.1 Use of imputation credits (gamma)

In the draft decision the AER considered the best estimate of gamma was 0.45. This was based on a payout ratio estimate of 70 per cent and an estimated value for a dollar of distributed imputation credits (theta) of 0.65. However, the AER noted that the value of gamma was being considered by the Tribunal, and that the Tribunal decision on the value of gamma would be taken into account for the AER's final decision on Envestra's access arrangement.

[3] Envestra, *Letter to the AER, Value of imputation credits – recent Australian Competition Tribunal's decision*, 4 May 2011; Envestra, *Letter to the AER, Value of imputation credits – Decision of the Australian Competition Tribunal in application by Energex Limited (Gamma) (No. 5)[2011] A CompT 9, File Nos. 2, 3 and 4 of 2010 (Energex proceedings)*, 17 May 2011.

The AER considers that the findings of the Tribunal on a gamma of 0.25 should be applied for the purposes of this access arrangement review.[4] There is no new evidence currently before the AER that would cause it to depart from the findings of the Tribunal in respect of gamma.

Consistent with the draft decision and the findings of the Tribunal, the AER considers that the best estimate of the payout ratio based on the empirical evidence currently available is 70 per cent.

The AER considers that redemption rate studies that have been adjusted on economically justifiable bases[5] can be used as a check on the reasonableness of the market value of imputation credits as estimated from dividend drop-off studies.[6] The AER may consider further evidence on this in the future.

The AER considers that the market value of distributed imputation credits estimated by dividend drop-off studies is inherently imprecise. Dividend drop-off studies infer a value for imputation credits from the prices of stocks trading around the ex-dividend date. It is not imputation credits that are being traded but rather the package of cash dividends and any imputation credits that may be attached. Furthermore, dividend drop-off studies are affected by estimation issues including multicollinearity and heteroscedasticity.[7] In light of these issues the AER considers that a range of evidence should be considered where available.

However, for the purposes of this decision, the AER has applied a value consistent with findings of the Tribunal. The AER has adopted SFG's latest dividend drop-off study based estimate of the market value of imputation credits of 0.35 for theta. Combined with a payout ratio estimate of 70 per cent this provides a gamma estimate of approximately 0.25.

6.3.2 Forecast taxation allowance

The AER has recalculated Envestra's forecast tax allowance as a result of the changes discussed above. This includes correcting a transcription error in the value of gamma and other changes that affected Envestra's proposed revenues/expenditures. As a result of these changes, Envestra's estimated tax allowance is not the best possible, as required under r. 74(2) of the NGR. The AER difference between Envestra's proposed tax allowance and AER's decision on the tax allowance is due mainly to the transcription error. The error understated the value of imputation credits and therefore overstated the tax allowance. No submissions were received in relation to Envestra's proposed taxation allowance. The AER's decision on Envestra's forecast tax allowance for the access arrangement period is shown in table 6.2.

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4 See Australian Competition Tribunal, *Application by Energex Limited (Gamma) (No. 5)[2011] A CompT 9*, 12 May 2011.

5 Such as to incorporate any time value loss between when an imputation credits is distributed and when it is redeemed.

6 For example Hathaway and Officer (2004) used their redemption rate estimate for the value of imputation credits as a "background average" to corroborate their dividend drop-off estimate of the market value of imputation credits. See Hathaway and Officer, *The valuation of imputation credits, update 2004*, November 2004, pp. 14–15.

7 AER, *Draft decision, Envestra Ltd access arrangement proposal for the SA gas network 1 July 2011–30 June 2016*, February 2011, pp. 109–110.

Table 6.2: AER tax allowance for the access arrangement period ($m, nominal)

	2011–12	2012–13	2013–14	2014–15	2015–16
Tax payable	3.5	3.5	3.3	3.0	3.0
Less value of imputation credits	0.9	0.9	0.8	0.7	0.7
Tax allowance	2.6	2.6	2.5	2.2	2.2

6.4 Conclusion

The AER does not accept the tax allowance proposed by Envestra. The AER requires amendments be made to the rate of return, capital expenditure, operating expenditure, and the opening the capital base. These changes impact on Envestra's revenues and expenditures, as outlined in the relevant chapters of this decision, which affect the estimate of the cost of taxation. The AER considers Envestra's proposed estimate of the cost of taxation is not representative of the best estimate possible, as required under r. 74(2) of the NGR. Accordingly, the AER proposes revision 6.1 to take account of the various changes impacting its tax allowance, including the change to gamma.

6.5 Revisions

The AER proposes the following revision:

Revision 6.1: amend the revised access arrangement and revised access arrangement information to reflect the tax allowance in table 6.2.

7 Incentive mechanisms

Envestra proposed an incentive mechanism applying only to opex. In its draft decision, the AER accepted that a mechanism should be in place to provide incentives for the achievement of efficiencies in opex, but considered several amendments were required to the proposed incentive mechanism.[1] Envestra's revised access arrangement proposal largely reflected the AER's amendments, except those requiring:

- *the provision to the AER of information on opex and capex classification changes and a calculation of their impact on forecasts*
- *alteration to the equation for calculating the first year of the next access arrangement period.[2]*

The AER does not accept Envestra's revised access arrangement proposal. The AER considers that Envestra should provide it with opex and capex classification changes and a calculation of their impact on forecasts on an ongoing basis. This is required to ensure the reasonableness of any classification changes, and ensure the operation of the incentive mechanism is not artificially altered via these changes.

Further, the AER considers Envestra's concerns as to the calculation of carryover amounts for the first year of the next access arrangement period are sufficiently addressed by the equation set out in the draft decision. However, to provide further clarity to the calculation of the fifth year carryover amount, the AER has provided an updated revision to the formula.

7.1 Regulatory requirements

Where an incentive mechanism is operating in the earlier access arrangement period, the NGR requires that Envestra includes in its access arrangement proposal details of the carryover of increments (decrements) for efficiency gains (losses). It should also demonstrate how an allowance is to be made for any such increments (or decrements) (r. 72(1)(i) of the NGR).

For the access arrangement period, the NGR allows for Envestra to propose (or for the AER to require) one or more incentive mechanisms to encourage efficiency in the provision of services (r. 98(1) of the NGR). Such a mechanism may provide for the carryover of increments (decrements) for efficiency gains (losses) from the access arrangement period to the next (r. 98(2) of the NGR).

Where an incentive mechanism is proposed the NGR requires Envestra to:

- include the rationale for proposing such a mechanism (r. 72(1)(l) of the NGR)
- ensure that the proposed mechanism is consistent with the revenue and pricing principles (r. 98(3) of the NGR).

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1 AER, *Draft decision*, February 2011, p. 106.

2 Envestra, *Revised Qld access arrangement information, Attachment 11-1 – Incentive mechanism*, pp. 1–2.

In assessing Envestra's proposed access arrangement the AER must take into account the transitional provisions of the NGR including clause 5(1)(a) of schedule 1 of the NGR. This relates to the operation of an incentive mechanism approved under section 8.44 of the Code. In particular, the AER is required to ensure that revenue calculations made for the access arrangement period properly reflect increments or decrements resulting from the operation of the incentive mechanism in the earlier access arrangement period.

7.2 Revised access arrangement proposal

In the draft decision, the AER accepted that a mechanism to provide incentives for the achievement of opex efficiencies should be in place, but considered several amendments were required to Envestra's proposed mechanism.[3] Envestra largely accepted the AER's amendments, except for:

- the provision of opex and capex classification changes and a calculation of their impact on forecasts
- the equation to be applied to the first year of the next access arrangement period.[4]

In relation to classification changes, Envestra submitted:

- the AER has existing powers to review and comment on Envestra's regulatory accounting frameworks and should rely on these aspects of the regime to obtain information about capitalisation changes
- while capitalisation changes can affect the operation and powers of incentive mechanisms, the amendment would impose additional compliance costs, is more intrusive and not necessary.[5]

In relation to the equation applied in the first year of the next access arrangement period, Envestra submitted:

- the AER's approach distorts signals by removing any benefit obtained within the fifth year of the access arrangement period
- the equation appears to provide different carryover outcomes for different years of the access arrangement period
- Envestra's proposed approach eliminates the incentive on the distributor to withhold efficiency benefits in the final year of the access arrangement period when a base year roll forward approach is adopted to forecast opex
- Envestra should be rewarded for achieving the same efficiency gain (loss) through the incentive mechanism regardless of when those gains (losses) are achieved.[6]

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3 AER, *Draft decision*, February 2011, p. 106.
4 Envestra, *Revised Qld access arrangement information, Attachment 11-1 – Incentive mechanism*, pp. 1–2.
5 Envestra, *Revised Qld access arrangement information, Attachment 11-1 – Incentive mechanism*, p. 1.

7.3 AER's consideration

7.3.1 Opex and capex classification change information and impacts

Envestra did not amend its access arrangement proposal consistent with the draft decision. It did not include the requirement to provide the AER with details of changes in capitalisation classification and a calculation of their impact on forecast and actual opex. The AER proposes not to approve Envestra's revised access arrangement proposal. The AER maintains its draft decision that information pertaining to opex/capex classification changes and impacts resulting from these are required during the access arrangement period. This information is required to ensure that the calculation of efficiency gains is not artificially affected by shifting of opex to capex.

The AER considers that in applying the incentive mechanism to opex only, there may be an incentive to shift opex to capex.[7] Cost shifting from opex to capex will appear under the mechanism to result in lower actual opex, but this would not have been the result of any derived efficiency. This was acknowledged by Envestra.[8] The AER considers that such a result would adversely affect the operation of efficiency calculations and not encourage efficiency in the provision of services as required by r. 98(1) of the NGR.

Although the AER recognises that this requirement will necessitate additional information to be prepared by Envestra, the AER considers that monitoring the operation of the incentive mechanism on an ongoing. This type of information is additional to information already provided to the AER by means of other review processes and therefore the AER requires that it be provided as part of the annual reporting process.

7.3.2 Equation for first year of next period

Envestra did not amend its access arrangement proposal consistent with the draft decision. It did not apply the AER's equation for the calculation of carryover amounts for the first year of the next access arrangement period. The AER considers that the equation is required for the first year of the next access arrangement period to properly accommodate the implicit carryover amount for efficiency gains (losses) made in the final year of the access arrangement period. Therefore, the AER proposes not to approve Envestra's revised access arrangement proposal.

The AER considers that there is no dispute over the aims of the incentive mechanism. Both the draft decision and the revised access arrangement proposal state that the service provider should have the same overall incentive to seek efficiency gains in each year of the access arrangement period. However, the implementation of this aim in the draft decision appears to have been unclear. As such, the AER considers that further clarification is required on the treatment of the final year of the access arrangement period.

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6 Envestra, *Revised Qld access arrangement information, Attachment 11-1 – Incentive mechanism*, pp. 1–2.

7 AER, *Draft decision*, February 2011, p. 108.

8 Envestra, *Revised Qld access arrangement information, Attachment 11-1 – Incentive mechanism*, pp. 1–2.

The AER's draft decision set out that the estimate for opex in the final year of the access arrangement period should be calculated using the following equation:[9]

$A_5^* = F_5 - (F_4 - A_4)$

Where:

A_5^* is the estimate of opex for the final year of the access arrangement period.

F_5 is the forecast opex for the final year of the access arrangement period.

F_4 is the forecast opex for the penultimate year of the access arrangement period.

A_4 is the actual opex for the penultimate year of the access arrangement period.

The above equation represents the assumption that no additional efficiency gain is made in the last year of the access arrangement period so that no carryover amount is generated in the last year of the access arrangement period. Envestra also submitted in its access arrangement proposal[10] and its revised access arrangement proposal[11] that there should be no carryover in respect of the final year of the access arrangement period. It can be shown mathematically that the above equation results in no carryover amount by substituting A_5^* into the equation used for years two to four of the access arrangement period as shown below.

$$E_5 = (F_5 - A_5^*) - (F_4 - A_4)$$

$$= (F_5 - F_5 + F_4 - A_4) - (F_4 - A_4)$$

$$= F_5 - F_5 + F_4 - A_4 - F_4 + A_4$$

$$= 0$$

The AER considers that this equation for the final year of the access arrangement period is required to accommodate the implicit carryover amount for efficiency gains (losses) made in the final year of the access arrangement period. This implicit gain (loss) is rewarded through a higher (lower) forecast opex than would occur if expenditure in the last year of the access arrangement period was known. As this implicit gain (loss) is automatically provided to Envestra, any additional benefit obtained in the final year through the incentive mechanism would constitute double counting. Furthermore, the implicit benefit of a higher (lower) forecast opex also means that an adjustment is required to the first year of the next access arrangement period.

As set out in the draft decision, where differences arise between the estimate, A_5^*, and the actual opex incurred in the final year of the access arrangement period, the first year of the next access arrangement period should be adjusted as follows:[12]

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9 AER, *Draft decision*, February 2011, p. 110.
10 Envestra, *Qld access arrangement information*, October 2010, p. 169.
11 Envestra, *Revised Qld access arrangement information, Attachment 11-1 – Incentive mechanism*, p. 2.
12 AER, *Draft decision*, February 2011, p. 110.

$E_6 = (F_6 – A_6) – (F_5 – A_5) + (F_4 – A_4)$

where:

E_6 is the efficiency gain in the first year of the next access arrangement period.

F_6 is the forecast opex for the first year of the next access arrangement period.

A_6 is the actual opex for the first year of the next access arrangement period.

F_5 is the forecast opex for the final year of the access arrangement period.

A_5 is the actual opex for the final year of the access arrangement period.

F_4 is the forecast opex for the fourth year of the access arrangement period.

A_4 is the actual opex for the fourth year of the access arrangement period.

The AER does not accept Envestra's statement that the incentive mechanism provides different carryover outcomes for different years of the access arrangement period. The approach set out in the draft decision ensures Envestra is consistently rewarded for achieving efficiency gains (losses) regardless of which year those gains (losses) are achieved. This includes both the explicit carryover from the incentive mechanism and the implicit carryover inherent in the five-year reset process where final year actuals are not known.

The AER considers that this approach is consistent with r. 98(3) of the NGR and also provides for an estimate of a carry over amount that is arrived at on a reasonable basis in accordance with r. 74(2) of the NGR. This approach is also consistent with previous AER gas decisions[13] and the Efficiency Benefit Sharing Scheme (EBSS) developed by the AER under the National Electricity Rules.[14]

7.4 Conclusion

The AER proposes to maintain its draft decision and requires that Envestra provide information concerning any capitalisation changes and the impact of those changes as part of the annual reporting process.

Furthermore, the AER also proposes that the equation for the calculation of carryover amounts for the first year of the next access arrangement period be maintained as per the draft decision. While maintaining its draft decision position, the AER requires an update to its draft decision amendment for the calculation of the carryover in the final year of the access arrangement period. This update is to ensure clarity as to the required calculation.

7.5 Revisions

The AER proposes the following revisions:

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13 AER, *Draft decision: ActewAGL – Access arrangement proposal for the ACT, Queanbeyan and Palerang gas distribution network 1 July 2010 – 30 June 2015*, November 2009, pp. 79–81.

14 AER, *Final decision: Electricity distribution network service providers: Efficiency benefit sharing scheme, Appendix E*, June 2008, pp. 5–6.

Revision 7.1: amend the revised access arrangement proposal to include a statement under s. 5.1 that, if there is a change in Envestra's approach to classifying costs as either capex or opex, Envestra must provide to the AER a detailed description of the change and a calculation of its impact on forecast and actual opex.

Revision 7.2: amend the revised access arrangement proposal to include a statement under s. 5.1 that carryover amounts for the first year of the access arrangement period commencing 1 July 2016 are to be estimated using the following equation:

$E_6 = (F_6 – A_6) – (F_5 – A_5) + (F_4 – A_4)$

where:

E_6 is the efficiency gain in the first year of the next access arrangement period.

F_6 is the forecast opex for the first year of the next access arrangement period.

A_6 is the actual opex for the first year of the next access arrangement period.

F_5 is the forecast opex for the final year of the access arrangement period.

A_5 is the actual opex for the final year of the access arrangement period.

F_4 is the forecast opex for the fourth year of the access arrangement period.

A_4 is the actual opex for the fourth year of the access arrangement period.

Revision 7.3: delete dot point 10 under s. 5.1 of the revised access arrangement proposal.

Revision 7.4: delete and replace the fourth dot point under s. 5.1 of the revised access arrangement proposal to state that the estimate for opex in the final year of the access arrangement period is to be estimated using the following equation:

$A_5^* = F_5 – (F_4 – A_4)$

where:

A_5^* is the estimate of opex for the final year of the access arrangement period.

F_5 is the forecast opex for the final year of the access arrangement period.

F_4 is the forecast opex for the penultimate year of the access arrangement period.

A_4 is the actual opex for the penultimate year of the access arrangement period.

Carryover amounts for the final year of the access arrangement period are to be estimated using the following equation:

$E_5 = (F_5 – A_5^*) – (F_4 – A_4)$

where:

E_5 is the efficiency gain for the final year of the access arrangement period.

F_5 is the forecast opex for the final year of the access arrangement period.

A_5* is the estimate of opex for the final year of the access arrangement period.

F_4 is the forecast opex for the penultimate year of the access arrangement period.

A_4 is the actual opex for the penultimate year of the access arrangement period.

8 Operating expenditure

Operating expenditure (opex) refers to the operating, maintenance and other costs of a non-capital nature incurred by a service provider in the provision of distribution pipeline services. This expenditure also includes costs incurred in increasing long-term demand for pipeline services and otherwise developing the market for pipeline services.

The AER in its draft decision did not accept Envestra's proposal ($111 million) over the access arrangement period as being prudent and efficient, requiring amendments to apply alternative input cost escalators, apply an efficiency adjustment to base year costs, and reduce network development, UAG, and several non-base year costs. Overall, the AER accepted opex of $85 million for the access arrangement period, representing a $25 million (23 per cent) decrease on the access arrangement proposal.

While accepting a number of the AER's amendments to the non-base year costs, Envestra did not accept the AER's draft decision in relation to the base year efficiency adjustment, UAG and network development costs, and several non-base year costs.

Having considered the further advice of its consultants, public submissions, together with internal analysis, the AER considers Envestra's revised proposal inconsistent with the NGR and NGL. While accepting Envestra's revised proposal to not apply a base year efficiency adjustment, its proposed UAG price forecast and one of its non base year costs, the AER proposes revisions to:

- *remove one program from the network development expenditure*
- *apply alternative input cost escalators*
- *revise the expected leak repair cost savings.*

Overall, these revisions result in the AER accepting $105 million in opex over the access arrangement period, representing a 9 per cent decrease on the revised access arrangement proposal. This represents a 10 per cent increase in real terms compared to expenditure over the earlier access arrangement period.

8.1 Regulatory requirements

Rule 91 of the NGR provides that operating expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted industry practice, to achieve the lowest sustainable cost of delivering pipeline services.

The access arrangement information for an access arrangement proposal must include operating expenditure (by category) over the earlier access arrangement period and a forecast of operating expenditure over the access arrangement period and the basis on which the forecast has been derived.[1]

[1] NGR, r. 72(1)(a)(ii) and r. 72(1)(e)

Any forecast or estimate must be supported by a statement of the basis of the forecast or estimate.[2] A forecast or estimate, must be arrived at on a reasonable basis, and must represent the best forecast or estimate possible in the circumstances.[3]

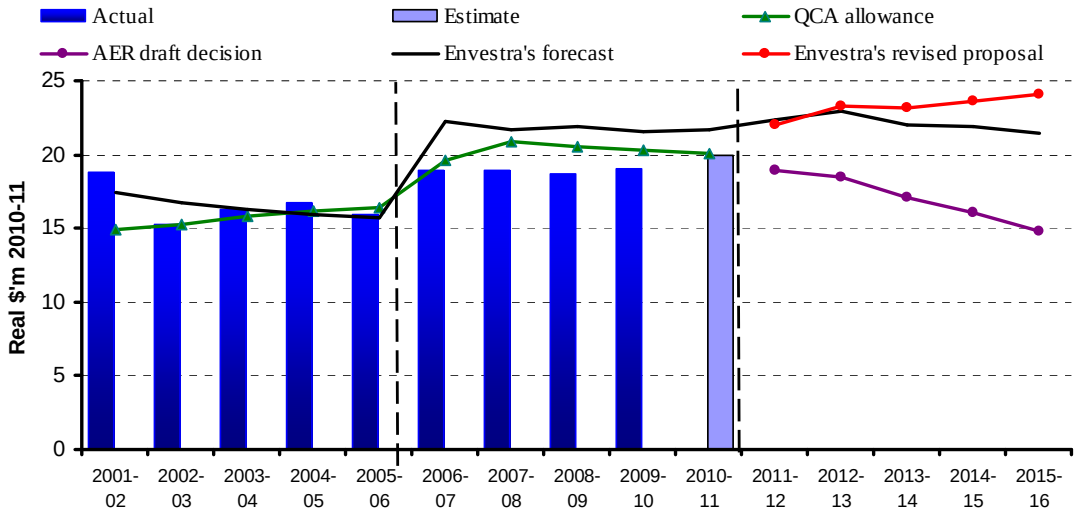
8.2 Revised access arrangement proposal

The AER's draft decision required substantial revisions to Envestra's opex proposal, decreasing total opex over the access arrangement period from $111 million to $85 million. While accepting some minor amendments to its non-base year costs, Envestra disagreed with the majority of the amendments, submitting a revised proposal which provided the following in response:

- Further information to support its original proposal
- New material that amended the quantum from the original proposal, including:
  - Updates to input cost escalators and insurance costs
  - Alternative price assumptions for UAG costs
  - An update to the base year costs, resulting from audited account data.

The net effect is that Envestra proposed total opex that is an increase on its original proposal, and substantially greater than that approved in the AER's draft decision – an increase of $31 million. Envestra's revised access arrangement proposal is summarised in figure 8.1 with disaggregated opex categories shown in table 8.1.

Figure 8.1: Envestra's revised proposed opex ($m, 2010–11)[4] [5]



Source: AER, *Draft decision*, February 2011, p.129;
Envestra, *Revised Qld access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, p.47.
Envestra, *Email to the AER, AER.EN.RP.05 Response*, April 2011.

2 NGR, r. 74(1)
3 NGR, r. 74(2)
4 All data presented in figure 8.1 are exclusive of debt raising costs.
5 All data presented in this chapter has been converted by the AER into $2010-11 using the March CPI of 3.33%, rather than the 2.52% used in the AER's draft decision.

Table 8.1: Envestra's revised opex forecast ($m, 2010–11)

	2011-12	2012-13	2013-14	2014-15	2015-16	Total
Operating & maintenance	15.0	16.2	16.0	16.4	16.7	80.3
Admin & general	3.4	3.5	3.5	3.6	3.7	17.7
UAG	0.9	0.9	0.9	0.9	0.9	4.3
Network development	1.7	1.7	1.7	1.7	1.7	8.5
FRC	1.0	1.1	1.1	1.1	1.2	5.5
Total opex	22.0	23.2	23.2	23.7	24.1	116.2
Debt raising costs	0.2	0.2	0.2	0.3	0.3	1.2
Total opex (inc. debt raising costs)	22.2	23.5	23.4	23.9	24.4	117.4

Source: Envestra, *Revised Qld access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, p.47;
Envestra, *Email to the AER, AER.EN.RP.05 Response*, April 2011;
Envestra, *Email to the AER, AER.EN.RP.06 Response*, April 2011.

Envestra submitted the following issues for the AER's consideration:

Unaccounted for gas:

While accepting the AER's draft decision in relation to UAG volumes, Envestra did not amend its access arrangement to incorporate the AER's alternative and lower price assumptions for UAG costs. An alternative price forecast was proposed following its competitive tendering for a gas contract to cover UAG losses.[6] Envestra's revised UAG assumptions are set out in table 8.2.

Table 8.2: Envestra's revised UAG opex ($m, 2009–10)

	2011-12	2012-13	2013-14	2014-15	2015-16	Total
Volume (GJ)	[text removed – c-i-c]					
Price ($/GJ)	[text removed – c-i-c]					
Total cost ($m)	0.83	0.83	0.83	0.83	0.83	4.15

Source: Envestra, *Qld access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, pp.40-43., and, Envestra, *Qld access arrangement information, Attachment 6-11B – Qld UAG price*, April 2011, p.4.

Network development

Envestra did not amend its access arrangement consistent with the AER's draft decision to reduce network development opex by $2.7m. The AER required the removal of three programs: development and deployment of new technologies; incentive payments; and website and IT management. Further information was

[6] Envestra, *Qld access arrangement information, Attachment 6-11 – UAG price tendering process*, March 2011.

provided in support of these programs, seeking to address the AER's concerns over their underlying efficiency assumptions and matters of possible double counting.[7]

Table 8.3: Envestra's revised network development opex ($m, 2010–11)

	2011-12	2012-13	2013-14	2014-15	2015-16	Total
Hot water incentive program	0.23	0.23	0.23	0.23	0.23	1.14
Website & IT	0.05	0.05	0.05	0.05	0.05	0.26
Development & deployment	0.26	0.26	0.26	0.26	0.26	1.29
Other[8]	1.16	1.16	1.16	1.16	1.16	5.79
Total network development	**1.69**	**1.69**	**1.69**	**1.69**	**1.69**	**8.47**

Source: Envestra, *Email to AER, AER.EN.RP.06*, 21 April 2011.

Input cost escalators

Envestra did not amend its access arrangement consistent with the AER's draft decision to not accept aspects of its forecast real input cost escalators, including those used to escalate network materials and labour costs. Supported by further reports from consultants: BiS Shrapnel; Professor Ian Borland; and, Economic Insights, Envestra set out why it disagreed with the AER's amendments and also revised its forecast real cost escalators in relation to:[9]

- labour cost escalators
- 'gas network materials' escalator
- the application of six year average real cost escalation escalators.

Base year efficiency adjustment

Envestra did not amend its access arrangement consistent with the AER's draft decision to apply an efficiency adjustment to its base year costs (2009-10). Supported by additional reports from consultants, Economic Insights and Marskman, Envestra disagreed with the adjustment, submitting that:[10]

- the AER and Wilson Cook incorrectly concluded that Envestra's outsourcing agreement with the APA Group did not result in efficient opex.
- the AER's comparative benchmarking analyses did not account for differences in operating environments and capitalisation policies between businesses.

7 Envestra, *Revised Qld access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, pp.33-39.

8 Other category includes expenditure for network development categories accepted in the AER's draft decision, including: operations support, advertising, and, operating costs.

9 Envestra, *Revised Qld access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, pp.23–33.

10 Envestra, *Revised access arrangement proposal, Attachment 6-9- Operating expenditure*, March 2011, pp. 4-14.

- additional analysis by Economic Insights demonstrates that Envestra's productivity, when adjusted to include network marketing costs and exclude full retail contestability (FRC) capex, is comparable to other distribution businesses.

Base year update

Envestra's initial access arrangement proposal relied on 9 months of actual data and 3 months of estimates, to be confirmed later by audited regulatory accounts.[11] The update was not incorporated by the AER in its draft decision and so has formed part of the revised access arrangement proposal.[12]

Non-base year costs

The AER's draft decision required amendment or removal of six of the nine non-base year costs, a reduction of $1.5m. While accepting four amendments, Envestra disagreed with the AER in respect of two, submitting further information in their support.[13] Envestra's revised non-base year costs are set out in table 8.4.

Table 8.4: Envestra's revised proposed non-base year costs ($2010–11)

Item & total cost	Draft decision & revision	Revised proposal
Opex related to capex: *Leak repair cost saving* - opex reduction associated with leak repairs, due to leak reductions resulting from mains replacement program -$4.38m	The AER accepted the basis of the calculation but as it reduced the mains replacement program, the expected saving was reduced by 8.5 per cent ($0.38m).	The AER's amendment based on the advice of Wilson Cook contained is incorrect and overstated. Further, there was no evidence outlining how Wilson Cook determined the 8.5 per cent figure.[14]
Step change: *Real increase in insurance costs* – proposal supported by Marsh report [c-i-c]	The AER rejected the insurance costs, considering insufficient evidence was demonstrated that the access arrangement period will require a step increase in insurance costs	Envestra submitted a further report by consultants, Marsh, to address the AER's concerns as to forecasting assumptions. The Marsh report also updated the premiums by a further $0.1m, to reflect current industry circumstances.[15] Envestra also submitted it requires business interruption insurance (c-i-c) should the AER maintain its decision to amend one of the aspects of its terms and conditions. The amendment would enable network users to have the benefit of the consequential loss exclusion on the cap on liability.[16]

11 Envestra, Qld access arrangement information, October 2010, p. 73

12 Envestra, *Revised Qld access arrangement proposal, attachment 6-9- Operating expenditure*, March 2011, p. 44.

13 Envestra, *Revised Qld access arrangement proposal, attachment 6-9- Operating expenditure*, March 2011, pp. 43-46.

14 Envestra, *Qld Revised access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, pp.45-46.

15 Envestra, *Revised Qld access arrangement information, Attachment Q62A – Insurance opex, March 2011*., and, Envestra, *Revised Qld access arrangement information, Attachment 6-12 – Insurance forecast methodology*, March 2011.

16 Envestra, *Qld Revised access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, p.43.

8.3 Summary of submissions

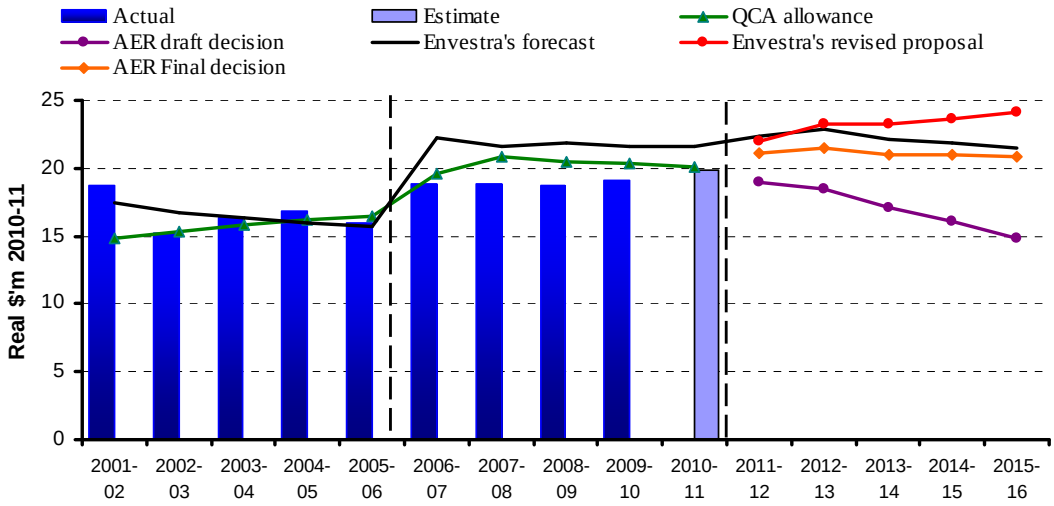
The AER received two submissions from interested parties, including one from Envestra itself, commenting on the AER's draft decision and Envestra's proposal:

- Origin supported the AER's draft decision to reduce UAG costs and to benchmark Envestra's previous expenditure against other gas distributors, submitting that it disagreed with the updated reports submitted by Envestra.[17]
- Envestra submitted further information in support of its revised access arrangement proposal, including:
  - Further information in support of its network development programs[18]
  - Information indicating that its revised UAG price forecasts were incomplete, and further costs are required.[19]

8.4 AER's consideration

The AER does not accept Envestra's revised opex proposal of $116 million in total over the access arrangement period. While being convinced by a number of aspects of the revised proposal, the AER proposes further revisions, to reduce the opex forecast by $11.7 million.

Figure 8.3: AER final decision on Envestra's opex forecast ($m, 2010–11)



Of the issues raised in Envestra's revised access arrangement proposal, the most material included the base year efficiency adjustment ($10m), input costs escalators ($9.5m), network development ($8.5m), and UAG ($4.3m). Other issues raised include an update of the base year, two non-base year costs and debt raising costs.

17 Origin, *Envestra Qld Access arrangement draft decision and revised proposal*, April 2011.
18 Envestra, Revised Qld access arrangement information, Attachment: Gas air conditioning board report (Confidential), April 2011.
19 Envestra, Revised Qld access arrangement information, Attachment: 6-11B – Qld UAG price, April 2011.

8.4.1 Base year efficiency adjustment

The AER engaged Wilson Cook to provide further advice on Envestra's claims why an efficiency adjustment should not be applied to its base year opex (2009-10). Having considered the further information submitted in Envestra's revised proposal, and the advice of Wilson Cook[20], the AER accepts that the efficiency adjustment (a total reduction of $10 million on the initial opex proposal) should be removed. Envestra's updated analysis and qualifications to the comparative data used by the AER, suggests that the base year cannot be determined inefficient.

The further information submitted by Envestra indicated matters adversely affecting cost efficiency and productivity comparisons with other gas distributors. The AER considered:

- The updated Economic Insights report indicates pronounced environmental characteristic (operating and network) differences between Envestra's Queensland network and that of distributors in other jurisdictions, suggesting APT Allgas is the most comparable.[21]

- The Marksman report was updated, with adjustments to certain costs such as marketing and FRC, to enable more meaningful comparisons between businesses. Accounting for these adjustments, Envestra's opex performance is shown to be comparable with other gas distributors.[22]

- The updated Marskman report also identifies that Envestra's underperformance relative to APT Allgas in opex benchmarks appears offset by comparable outperformance of APT Allgas in capex benchmarks.[23] Further, the two businesses are comparable in terms of total (capex and opex combined) expenditure. Total expenditure comparisons, and capex benchmarking, is generally problematic given the lumpy and inconsistent time path of capex projects. However, the information suggests that there is a real possibility that differences in capitalisation policies between Envestra and APT Allgas could be adversely influencing comparisons.

Ascertaining the influence of the environmental and business characteristics that Envestra claims adversely affects industry comparisons would require more detailed benchmarking analysis – a form of bottom up assessing of base year costs. Such analysis would include matters such as the influence of scale effects, comparisons of customer and energy densities, and detailed cost allocation reporting across businesses. The data for such analyses is currently either not available, not of a sufficiently high quality or is inconsistently available. As such, the AER accepts that in Envestra's case, industry comparisons must be limited to high level benchmarking.

However, the AER has commenced a process of collecting a greater volume and more standardised data from network businesses, in order to overcome these limitations in subsequent access arrangement periods.

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20 Wilson Cook, *Additional report—Envestra Qld*, May 2010, pp. 5–12.
21 Economic Insights, *Review of AER draft decision on base year opex*, March 2011, p.8.
22 Economic Insights, *Review of AER draft decision on base year opex*, March 2011, p.20.
23 Marskman, *Further gas distributor benchmarking report – Envestra Queensland*, March 2011, p.6.

In summary, the AER accepts that 2009-10 is sufficiently representative of Envestra's current business and operational circumstances to provide a reasonable indication of expenditure for the access arrangement period.[24] Taking into account the limitations that were identified above in respect of cost efficiency and productivity comparisons, the AER accepts 2009-10 as being an efficient base on which to forecast opex for the access arrangement period, consistent with r.74 and r.91 of the NGR.

8.4.2 Input cost escalators

Envestra's proposed real input cost escalators represented $13 million of its total revised opex proposal for the access arrangement period The AER's detailed considerations on real input cost escalators are set out in appendix E. The AER does not accept the following aspects of Envestra's proposal:

- Labour cost escalators based either on the Average Weekly Ordinary Time Earnings (AWOTE) index including productivity adjustments, or on the Labour Price Index (LPI) index without productivity adjustments.
- The 'gas network materials' escalators — the escalators were based on unjustified assumptions and unsubstantiated relationships, and lack detail regarding important forecasting inputs.
- The application of six year average escalators — Envestra did not justify the application of such averages, and they would be inconsistent with the objectives of forecasting real cost escalation.

The AER considers Envestra's forecasts are not made on a reasonable basis, nor represent the best forecasts possible in the circumstances as set out in r.74 of the NGR. As a result, the proposed escalators do not contribute to forecasts of operating or capital expenditure that are respectively consistent with r.91 and r.79 of the NGR.

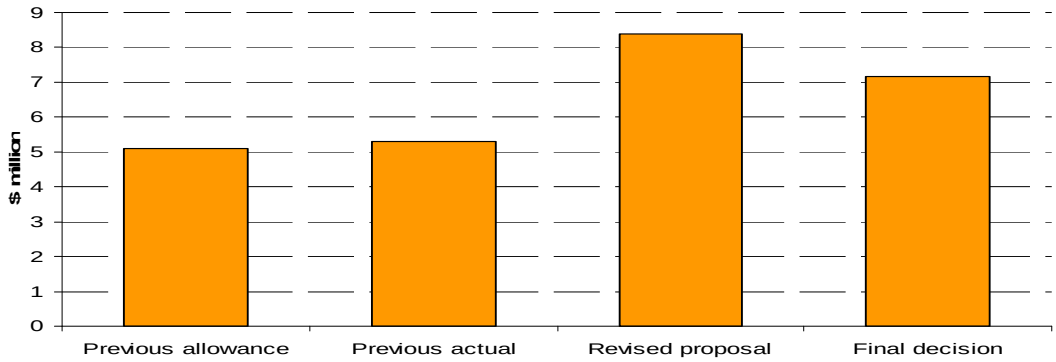
The AER engaged DAE to provide alternative forecasts of productivity adjusted real growth in the labour price index (LPI) and considers these forecasts to be consistent with r.74, and by extension r.91 of the NGR. Accordingly, the AER proposes revisions to the opex forecasts applying the real input cost escalators set out in appendix E. The AER's input cost escalators represent $3 million of the total opex approved by the AER for the access arrangement period.

8.4.3 Network development

The AER considers that while Envestra has adequately substantiated the efficiency assumptions behind the 'incentive payment' ($1.1 million) and 'website and IT' ($0.3 million) programs, it has not warranted departure in relation to the development and deployment program ($1.3 million). As set out in figure 8.2, the AER proposes to reduce Envestra's revised network development opex proposal by $1.3 million over the access arrangement period.

[24] AER, *Draft decision*, February 2011, p. 125.

Figure 8.2: AER final decision – Network development opex



Sources: AER, *draft decision*, February 2011, p. 121.
Envestra, Email to the AER, AER.EN.RP.06 Response, April 2011

Incentive payments

The incentive payment programs are designed to provide financial incentives for the uptake of various types of gas appliances. The AER is satisfied the cost estimates for its incentive program for gas hot water systems has been reasonably based, produces the best estimate possible leading to efficient costs, consistent with r.74 and r.91 of the NGR. The AER considered:

- The estimates of incentive uptake numbers for the project were based on a reasonable extrapolation of previous trials

- Envestra provided more detailed substantiation of the efficiency evaluation of the project, providing NPV calculations demonstrating the project to be of net benefit to consumers.

Development and deployment

This program involves the establishment of a group to develop and deploy a range of nascent technologies, commencing with gas air-conditioners. Envestra's revised proposal responded to the AER's concerns over the program's prudence and efficiency. It suggested the work appropriate for a gas distributor and that the regulatory framework presents a disincentive for innovation (as benefits are likely to extend beyond five years, unless a specific incentive mechanism is in place).[25] The program's efficiency was largely justified in terms of the average consumption associated with gas air-conditioners, which were to be the initial focus of the program. The AER considers that the further information submitted by Envestra has insufficiently addressed the AER's concerns.

The AER acknowledges that the AEMC's Stage 2 – Demand-side participation review commented that the regulatory framework might present challenges for the approval of projects for which expected benefits extend beyond the regulatory period. To the extent such disincentives exist, these are best addressed consistently across regulated firms, and not via ad-hoc approval of particular research and development programs. Despite its comments, the AEMC has not imposed regulatory requirements with

[25] Envestra, *Revised Qld access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, pp. 36-40.

regard to innovation. Further, the NGR as they stand do not provide for the AER to apply an incentive mechanism with respect to innovation.

As to the actual nature of the proposed program, the AER maintains its concern that the establishment of a new technologies group to develop and deploy a range of nascent technologies (commencing with gas air-conditioning) is an inappropriate role for a regulated distribution business. The project goes beyond efforts to develop the gas market, to efforts of a more technological development nature. To the extent such technologies have merit, the AER is unaware of current market barriers for unregulated firms to invest in these. It is also unclear, the extent to which the un-regulated portion of a regulated firm would benefit if provided an allowance for projects to develop marketable technologies.

Finally, while the efficiency of the project was broadly justified in terms of a gas air-conditioner's average consumption, the AER has not identified any forecast of uptake numbers of these appliances, nor calculation of estimated efficiency benefits of the project.

For the reasons articulated above, the AER considers that Envestra's development and deployment project does not comply with the requirements of prudency, efficiency (and good industry practice) set out in r.91 of the NGR. Accordingly, the AER considers that the opex forecast for this project is not arrived at on a reasonable basis. Further, as it does not comply with r. 91 of the NGR, the AER does not consider that an alternative forecast can or should be derived.

Website and IT

Envestra proposed opex to construct and manage a new website to deliver market development initiatives. The AER is satisfied that Envestra's revised proposal has addressed its initial concerns over the prudency of the program, and that the proposed expenditures could double count on costs in the base year, considering:[26]

- Envestra demonstrated that despite already having a website to provide information to current/potential gas consumers, it can not handle the proposed market promotion capabilities.

- the current website was not materially updated over the past 5 years so as to incur material expenditure and therefore the proposed expenditures would not be double counting on expenditures already contained in Envestra's base year opex.

In summary, the AER does not approve the development and deployment of new technologies program as consistent with r.74 and r.91 of the NGR. The AER proposes revision to network development opex to remove this program, as set out in table 8.5. Overall the revisions provide for network development expenditure representing an increase on historic expenditures and allowances.

[26] Envestra, *Revised Qld access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, pp. 36-37

Table 8.5: AER conclusion on Envestra's network development program ($m, 2010–11)

	2011-12	2012-13	2013-14	2014-15	2015-16	Total
AER Revision	-0.26	-0.26	-0.26	-0.26	-0.26	-1.29
AER final decision	1.44	1.44	1.44	1.44	1.44	7.18

8.4.4 Unaccounted for gas

UAG costs are derived by multiplying expected gas prices by expected volumes. While accepting the AER's amendment to apply a lower volume assumption, Envestra did not accept the AER's draft decision to reduce the UAG price assumption. Envestra originally submitted a UAG price based on a forecast prepared by Core consulting, of what it would cost to obtain a contract to cover UAG losses. In its draft decision, the AER did not accept that the forecast was reasonably based. Since then, Envestra has tendered for a contact, and submitted in its revised proposal an alternative price forecast for UAG. The AER accepts Envestra's UAG price has been reasonably forecast, considering:

- Envestra competitively tendered for a gas contract to cover UAG losses. Tenders were sought from four gas retailers.
- [Text removed – c-i-c].
- [Text removed – c-i-c].[27]

The AER considers Envestra's price assumptions estimated on a reasonable basis, producing the best possible forecast in the circumstances, consistent with r.74 of the NGR. The AER's accepted UAG assumptions are set out in table 8.6.

Table 8.6: AER final decision on UAG opex ($2010-11)

	2011-12	2012-13	2013-14	2014-15	2015-16	Total
Volume (GJ)			[Text removed – c-i-c]			
Price ($/GJ)			[Text removed – c-i-c]			
Total AER approved UAG opex ($m)	0.86	0.86	0.86	0.86	0.86	4.29

8.4.5 Updated base year

The draft decision did not reflect the update to Envestra's historic opex including its proposed base year, from the release of regulatory account data given the timing of its release. The AER accepts the update within the revised proposal, representing a decrease in the base year of $0.5 million ($2010-11) or 2.6 per cent.[28] The update

[27] Envestra, *Revised Qld access arrangement information, Attachment 6-11 – UAG price tendering process*, March 2011.

[28] Envestra, *Revised Qld access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, p. 44.

represents a decrease of $0.3m (1.9 per cent) on the opex categories to which the base year roll forward method was applied.

8.4.6 Debt raising costs

As debt raising costs have not been previously included in historic opex, the AER has identified these costs separately to enable meaningful comparisons. Debt raising costs are transaction costs, such as legal fees, underwriting fees or credit rating fees, incurred as debt is raised or refinanced.

The AER's draft decision did not accept Envestra's proposal to determine benchmark debt raising costs using a unit rate of 20.3 basis points per annum (bppa). It required Envestra to use the AER's standard method for the estimation of debt raising costs.[29] The AER updated the inputs to determine a debt raising cost unit rate of 10.9 bppa, which is applied to the benchmark debt component of the capital base to estimate the total allowance for debt raising costs for the access arrangement period.

Envestra's revised access arrangement proposal accepted the AER's approach to estimate the benchmark debt raising cost allowance.[30]

As the draft decision debt raising cost was based on an indicative discount rate, it needs to be updated for the discount rate applicable to this final decision. Table 7 shows the build up of the benchmark debt raising costs, after updating for the discount rate using the nominal vanilla WACC determined in this decision.

[29] AER, *Draft decision, Envestra Ltd access arrangement proposal for the Qld gas network 1 July 2011–30 June 2016*, February 2011, pp. 212–214.

[30] Envestra, *PTRM*, Input worksheet–row 190, March 2011.

Table 8.7: Direct debt raising costs with a nominal vanilla WACC of 9.77 per cent

Fee	Explanation	1 Issue	2 Issues	3 Issues	4 Issues	5 Issues
Amount Raised	Multiples of median MTN ($250m)	$250m	$500m	$750m	$1000m	$1250m
1. Gross underwriting fee	Median gross underwriting spread, up front per issue, amortised	7.25	7.25	7.25	7.25	7.25
2. Legal and road-show	$115K upfront per issue, amortised	0.74	0.74	0.74	0.74	0.74
3. Company credit rating	$50K per annum	2.00	1.00	0.67	0.50	0.40
4. Issue credit rating	4 basis points up front per issue, amortised	0.64	0.64	0.64	0.64	0.64
5. Registry fees	$3.5K per issue, per annum	0.14	0.14	0.14	0.14	0.14
6. Paying fees	$4/$1million per annum	0.04	0.04	0.04	0.04	0.04
Total	**Basis points per annum**	**10.8**	**9.8**	**9.5**	**9.3**	**9.2**

Source: ACG, Bloomberg, AER analysis.

Envestra has an opening capital base of $319 million, which leads to a notional debt component of $191 million at the assumed gearing ratio (60 per cent). This debt amount requires one standard size ($250 million) bond issue. After adjusting for the discount rate the appropriate unit rate estimate for benchmark debt raising costs is 10.8 bppa. This benchmark multiplied by the debt component of Envestra's capital base for each year of the access arrangement period results in a total allowance of $1.13 million ($2010–11) for debt raising costs. The AER considers this opex to be in accordance with r.74 and r.91 of the NGR.

8.4.7 Non base year costs

Table 8.8: AER consideration of Envestra's non-base year costs

Item	Wilson Cook recommendation	Final decision
Opex related to capex: *Leak repair cost saving* - opex reduction associated with leak repairs due to leak reduction resulting from the mains replacement program	No new information was provided to alter the view that the reduction should remain as set out in the AER's draft decision. Wilson Cook disagreed with Envestra's argument that the number of leaks from cast iron and unprotected steel mains would be at a similar rate per kilometre throughout its network. Envestra's gas leakage statistics show significant regional differences. Therefore, the number of leak repairs should be forecast by area in proportion to the recorded leakage. Wilson Cook's adjustment was done accordingly.[31]	The AER considers Envestra's proposed reduction in opex resulting from the mains replacement program is not reasonably estimated, as required by r.74 of the NGR. The best estimate of reductions is achieved by analysing leakage statistics on a regional basis. Envestra's opex needs revision to incorporate the reduction set out in the draft decision, and ensure consistency with r.91 of the NGR. An opex reduction of $0.21m is required to achieve the savings set out in the draft decision.
Step change: *Insurance premiums* (c-i-c)	The AER accepts Envestra's proposed real increases in insurance premiums as forecasts arrived at on a reasonable basis, representing the best forecast possible, considering: • The Marsh report set out additional information, satisfactorily explaining the forecasting method. It also outlined relative influences on the insurance market and where public liability and property insurance lie within the market cycle.[32] • While forecast for property and public liability insurance were revised upward, the increase was substantiated in the Marsh report. It stems from recent business environment circumstances, including natural disasters, that impacted on the insurance market. Envestra also submitted that if the AER maintains its draft decision in relation to amendments 13.30 and 13.31 to its terms and conditions, that it would require additional business interruption insurance (c-i-c).[33] As the AER maintains its decision to make this amendment, it acknowledges that an additional risk is placed upon Envestra. The AER considers business interruption insurance is required to mitigate this risk, and that these costs are consistent with r.91 of the NGR. Subsequent to its revised proposal, Envestra submitted that it will also incur further expenses additional to the cost of business interruption insurance, resulting from these amendments.[34] This information was not included in Envestra's revised proposal. The AER considers that Envestra has not provided a forecast of these additional costs, nor provided a basis on which forecast costs may be derived as required by r. 72(1)(e) of the NGR. Envestra did submit that it will require an additional cost pass through to enable it to recover costs of claims that may be lodged by network users.[35] The AER considers that the business interruption insurance proposed by Envestra is sufficient to cover this risk, and that Envestra has not sufficiently demonstrated the rationale for an additional cost pass through event as required by r.72(1)(k).	

8.5 Conclusion

The AER does not approve Envestra's revised opex proposal as it does not comply with the relevant requirements of the NGR and as such is inconsistent with the

31 Wilson Cook, *Report – Envestra (Qld)*, May 2011, p.5.
32 Marsh, *Insurance forecast methodology*, 14 March 2011, pp.1-4.
33 Envestra, *Revised Qld access arrangement information, Attachment 6-9 – Operating expenditure*, March 2011, pp. 43-44.
34 Envestra, *Email to the AER, AER.EN.RP.10 – Question regarding insurance costs*, 19 May 2011.
35 Envestra, *Email to the AER, AER.EN.RP.10 – Question regarding insurance costs*, 19 May 2011.

national gas objective. The AER proposes revisions to Envestra's revised access arrangement proposal, as set out in section 8.6 of this final decision.

Overall the AER approves $105 million in opex (not including debt raising costs) over the access arrangement period as consistent with the NGR, which represents a 10 per cent reduction on proposed expenditures. Figure 8.3 depicts the total opex proposed by the AER in its final decision, against the total opex originally proposed by Envestra, the total opex proposed in the AER's draft decision and the total opex proposed in Envestra's revised proposal.

In the subsequent access arrangement review, the AER will require Envestra to demonstrate that the non-base year costs accepted for this access arrangement period have been removed from the proposed base year.[36]

8.6 Revisions

The AER proposes the following revision:

Revision 8.1: amend the revised access arrangement proposal and revised access arrangement information to take account of the following table:

Table 8.9: AER's final decision on Envestra's forecast operating expenditure

	2011-12	2012-13	2013-14	2014-15	2015-16	Total
Initial proposal – total opex	22.38	22.88	21.07	21.87	21.47	110.67
AER draft decision – total opex	18.91	18.45	17.14	16.10	14.83	85.43
Revised proposal – total opex	22.02	23.23	23.19	23.66	24.11	116.20
AER specific revisions						
Network development	-0.26	-0.26	-0.26	-0.26	-0.26	-1.29
Leak repair cost saving	-0.03	-0.09	-0.07	-0.03	-0.00	-0.21
Total AER specific revisions	-0.29	-0.35	-0.33	-0.29	-0.26	-1.51
Total opex less AER specific revisions	21.73	22.88	22.86	23.37	23.85	114.69
Effect of AER input cost escalator revisions	-0.66	-1.36	-1.89	-2.43	-2.97	-9.31
Total AER approved opex	21.07	21.52	20.97	20.95	20.87	105.38
Debt Raising costs	0.20	0.21	0.23	0.24	0.25	1.13
Total AER approved opex (inc. debt raising costs).	21.27	21.73	21.20	21.19	21.12	106.51

[36] These include the costs under the sub-categories of: opex related to capex, ad-hoc opex, and, step changes.

9 Total revenue

The AER has calculated Envestra's total revenue requirement over the access arrangement period to be $325 million compared to the $375 million Envestra proposed. The total revenue requirement determined by the AER takes into account the revised access arrangement proposal submitted by Envestra.

The main reasons for the difference between the AER revenue requirement and Envestra's revised access arrangement proposal are changes to the WACC parameters, the capex and opex forecasts, and the forecast cost of taxation. The AER considers that the individual components of the revenue requirement it has determined are efficient and satisfy the revenue and pricing principles under section 24 of the NGL.

Based on the AER approved revenues and demand forecasts, the tariffs for haulage services for both volume and demand customers are expected to rise in real terms by about 5.3 per cent per annum (on average). The tariffs for ancillary services will increase each year only by the rate of change in CPI.

9.1 Regulatory requirements

Rule 72(1)(m) of the NGR provides that the access arrangement information for a full access arrangement proposal must include the total revenue to be derived from pipeline services for each regulatory year of the access arrangement period.

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 building block components are:

- a return on the projected capital base for the year
- depreciation on the projected capital base for the year
- forecast operating expenditure for the year
- the estimated cost of corporate income tax for the year (if applicable)
- any penalty or reward from the operation of an incentive mechanism.

Rule 97 sets out certain requirements regarding reference tariff variations. This rule is relevant to this chapter in so far as the X factors presented here form part of the variation mechanism.

9.2 Revised access arrangement proposal

In response to the AER's draft decision, Envestra's revised access arrangement proposal covers a number of components affecting revenues and costs. The component changes as discussed in the relevant final decision chapters are:

- rate of return on capital

- capital and operating expenditure forecasts.
- estimate of forecast cost of taxation.

Envestra's proposed total revenue requirement derived from pipeline services is shown in table 9.1.

Table 9.1 Envestra's total revenue over access arrangement period (revised) ($m, nominal)

	2011–12	2012–13	2013–14	2014–15	2015–16
Return on capital	34.7	38.1	41.9	45.1	48.4
Return of capital	2.8	3.4	3.8	3.6	4.0
Operating and maintenance	22.6	24.5	25.2	26.4	27.6
Benchmark tax liability	4.8	4.8	4.7	4.4	4.5
Carry-over amounts	–	–	–	–	–
Revenue requirement	65.0	70.8	75.6	79.5	84.5
Less: ancillary services revenue	0.5	0.5	0.6	0.6	0.6
Total haulage services revenue	64.4	70.3	75.1	79.0	83.9
X factors	–16.81	–13.00	–9.00	–4.00	–2.00

Source: Envestra, *Revised Qld access arrangement proposal*, March 2011, p.1, (attachment 12–4).

9.3 AER's consideration

The AER's final decision assessed the various components of Envestra's proposed revenue requirement with regard to the national gas objective and the revenue and pricing principles under ss. 23 and 24 of the NGL respectively, and the NGR. In considering the various components of the Envestra's cost and revenues the AER has determined a total nominal revenue requirement of $325 million over the access arrangement period. This compares to Envestra's proposed total revenue requirements of $375 million.

The AER requires that Envestra's revenue requirement be reduced to reflect the AER's assessment of the various revenue components including:

- the WACC for the access arrangement period
- capex for the access arrangement period
- opex for the access arrangement period
- tax allowance for the access arrangement period
- the opening capital base as at 1 July 2011

The total revenue requirement is smoothed and converted to tariffs using the forecast demand figures approved by the AER. The AER adjusted the X factors proposed by

Envestra to reflect the change in revenue requirement from Envestra's revised access arrangement proposal to that determined in this decision. The annual revenue requirements and annual price changes (as indicated by the X factors) are summarised in table 9.2. In deriving the profile of the X factors, the AER has been mindful of potential price shocks to customers and the effects this may have on efficient development of the market. The AER considers these matters relevant factors under r. 97 of NGR. The AER accepts that the same X factors will apply to all volume and demand customers, as discussed in chapter 11.

Table 9.2 AER's conclusion on Envestra's annual revenue requirement and X factors ($m, nominal)[a]

	2011–12	2012–13	2013–14	2014–15	2015–16
Return on capital	31.1	33.9	37.1	39.6	42.1
plus regulatory depreciation[b]	2.8	3.3	3.7	3.5	4.0
plus operating and maintenance	21.8	22.9	22.9	23.4	24.0
plus corporate income tax	2.6	2.6	2.5	2.2	2.2
Total revenue	**58.4**	**62.7**	**66.2**	**68.8**	**72.2**
less ancillary services revenue	0.5	0.5	0.6	0.6	0.6
Total haulage services revenue	**57.8**	**62.2**	**65.6**	**68.2**	**71.6**
Smoothed haulage services revenue	**54.9**	**60.4**	**65.5**	**70.6**	**75.9**
X factors[c]					
Haulage reference services (%)	-9.69	-5.00	-5.00	-4.00	-3.00
Ancillary service fees (%)	0.00	0.00	0.00	0.00	0.00

(a) Numbers may not add due to rounding.
(b) Regulatory depreciation includes the negative depreciation impact of inflation on the capital base.
(c) Negative values for X indicate real price increases under the CPI–X formula.

The X factors indicate there will be real increases of about 5.3 per cent per annum (on average) in haulage reference service tariffs over the access arrangement period. There are no real price changes for ancillary services fees, which will be indexed by the change in CPI each year.

9.4 Conclusion

The AER does not approve the annual revenue requirement proposed by Envestra because it does not comply with r. 76 of the NGR. The AER proposes revisions to Envestra's proposed revenue requirement in accordance with changes to the various revenue components, as discussed in the relevant chapters of this decision.

9.5 Revisions

The AER proposes the following revision:

Revision 9.1: amend the revised access arrangement and revised access arrangement information to reflect the revenues and X factors set out in table 9.2.

Part B – Tariffs

10 Demand forecasts

Demand forecasts are used to calculate the reference tariffs and also influence forecast capital and operating expenditure linked to network growth.

In its draft decision, the AER accepted Envestra's customer numbers, commercial and industrial (C&I) consumption, and demand maximum daily quantity (MDQ) forecasts, but amended the residential consumption forecast based on the historical rate of decline in average residential consumption.

In response to the draft decision, Envestra adjusted the residential consumption forecast as required by the AER. However, Envestra proposed to adjust the resultant forecast to account for demand responses to carbon and distribution network price increases. The AER considers the proposed approach is reasonable for the reasons set out in section 10.4.1. Similarly, the AER considers Envestra's proposal to adjust the C&I consumption and demand MDQ forecasts for carbon and network price increases is reasonable for the reasons set out in section 10.4.2.

Envestra also proposed to revise the C&I consumption and demand MDQ forecasts using updated economic forecast to account for the impacts of recent natural disasters in Queensland. The AER accepts the updated economic forecast is reasonable as it is in line with the updated forecast prepared by Queensland Treasury after the recent flooding.

The AER proposes to adjust the revised demand forecasts to reflect updated distribution network price forecasts based on the final decision revenue allowance. The revised forecasts are presented in table 10.4 for residential customers and table 10.6 for C&I and demand customers.

10.1 Regulatory requirements

Rules 72(1)(a)(iii) and 72(1)(d) of the NGR provide that the access arrangement information for a full access arrangement proposal for a distribution pipeline must include:

- usage of the pipeline over the earlier access arrangement period showing, for a distribution pipeline, minimum, maximum and average demand, and customer numbers in total and by tariff class

- to the extent that it is practicable, a forecast of pipeline capacity and utilisation of pipeline capacity over the access arrangement period and the basis on which the forecast has been derived.

Rule 74(1) of the NGR provides that any information in the nature of a forecast or estimate must be supported by a statement explaining the basis of the forecast or estimate.

Rule 74(2) of the NGR provides that a forecast or estimate must be arrived at on a reasonable basis and represent the best forecast or estimate possible in the circumstances.

10.2 Revised access arrangement proposal

In its draft decision, the AER rejected Envestra's proposal to reclassify large customers in the residential customer group to the C&I customer group, and the use of the resultant historical customer numbers and consumption data to forecast demand for the following reasons:[1]

- Envestra's lack of substantiation of the adjustment methodology
- insufficient supporting material to demonstrate the adjustment made to the data is consistent with the stated methodology.

In response to the concerns expressed by the AER,[2] Envestra engaged PKF to independently review and verify the reclassification methodology and the resultant historical data after reclassification.[3] PKF concluded that the adjustments applied to the historical data are consistent with the stated reclassification methodology by Envestra.[4] As a result, the revised historical data has been used by Envestra to prepare its demand forecasts.[5]

Envestra adopted the AER's draft decision to increase the average residential consumption forecast in line with historical trend.[6] However, based on advice from its demand consultant, the National Institute of Economic and Industry Research (NIEIR), Envestra proposed to adjust the draft decision forecast to incorporate the impacts of the following factors which it considered are not captured in the historical trend:[7]

- carbon price
- distribution network price increases.

Envestra adopted a long run price elasticity of -0.30 as advised by NIEIR to calculate the demand responses by residential customers to carbon and network price increases.[8]

Envestra proposed to incorporate the impact of the change in network prices by following three steps:

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1 Envestra proposed to reclassify residential customers with daily consumption greater than 0.274 GJ per day (around 10 times the average daily residential consumption) to C&I customer group.
Envestra, Email to the AER, *Revised Queensland History*, 2 December 2010.
AER, *Draft decision*, February 2011, pp. 166–167.

2 AER, *Draft decision*, February 2011, pp. 166–167.

3 Envestra, *Revised Qld access arrangement proposal, attachment 13-3 PKF Validation of Customer Reclassification methodology*, March 2011

4 Envestra, *Revised Qld access arrangement proposal, attachment 13-3 PKF Validation of Customer Reclassification methodology*, March 2011 (Confidential)
To reclassify large residential customers with daily consumption exceeding 0.274 GJ, which is 10 time the consumption of an average residential customer, to the C&I customer group

5 Envestra, *Revised Qld access arrangement proposal*, March 2011, attachment 13-2, p. 2.

6 Envestra, *Revised Qld access arrangement proposal*, March 2011, attachment 13-2, p. 2.

7 Envestra, *Revised Qld access arrangement proposal*, March 2011, attachment 13-2, pp. 2–5.

8 Envestra, *Revised Qld access arrangement proposal*, March 2011, attachment 13-2, p. 3.

1. produce an intermediate (baseline) demand forecast based on retail gas price projections that excludes the impact of changes in network prices, but includes the impacts of a carbon price; then
2. use the intermediate demand forecast and proposed revenue requirements as inputs into the PTRM to calculate the implied network price increases to apply from 1 July 2011; and then
3. re-run NIEIR's demand forecast model to produce the final demand forecasts.

Envestra proposed to update C&I consumption and demand MDQ forecasts previously accepted by the AER using a more up to date economic forecast. Envestra stated that the updated economic forecast used to develop the revised demand forecast is broadly in line with forecast prepared by the Queensland Treasury.[9]

In line with the approach taken to adjust the residential consumption forecast, Envestra proposed to adjust the C&I consumption and demand MDQ forecasts to incorporate the impacts of network expansion, carbon and distribution network price increases.[10]

In response to an AER query in relation to the submitted demand forecast figures, Envestra notified the AER on the 3 May 2011 that it had identified an error in NIEIR's modelling. Envestra stated that NIEIR incorrectly used South Australian retail gas price projections for forecasting consumption over Envestra's Queensland network. For this reason, Envestra resubmitted its demand forecasts.[11] Table 10.1 sets out the corrected baseline average residential consumption forecast derived based on the historical trend, a number of adjustments proposed by Envestra, and the final revised access arrangement proposal forecast.

Table 10.1: Average residential consumption forecast – (GJ)

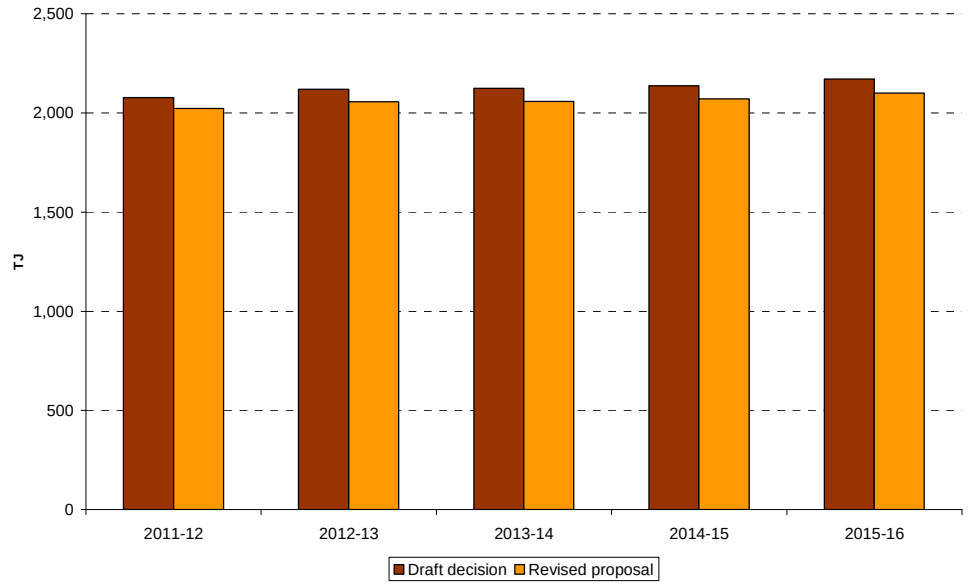
	2011-12	2012-13	2013-14	2014-15	2015-16
Revised proposal baseline forecast	7.91	7.79	7.67	7.56	7.44
Carbon price adjustment	0.00	-0.02	-0.06	-0.08	-0.10
Network price adjustment	-0.06	-0.14	-0.22	-0.28	-0.31
Final revised proposal forecast	7.85	7.62	7.39	7.20	7.03

Source: Calculated based on Envestra, *Revised Qld access arrangement proposal*, March 2011, attachment 13-2

Figures 10.1 and 10.2 compare the draft decision and revised access arrangement proposal volume customer consumption and demand MDQ forecasts.

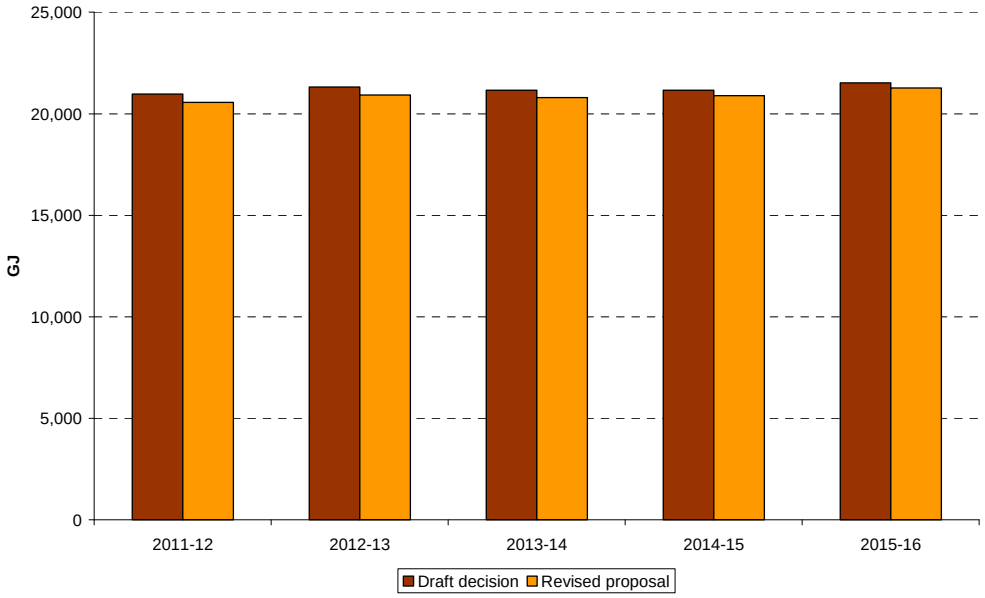
9 Envestra, *Revised Qld access arrangement proposal*, March 2011, attachment 13-2, p. 5.
10 Envestra, *Revised Qld access arrangement proposal*, March 2011, attachment 13-2, pp. 7–10.
11 Envestra, *FW: AER.EN.RP.06 - questions on the demand forecasts*, 3 May 2011

Figure 10.1: AER draft decision and revised proposal volume customer consumption forecasts (TJ)



Source: Envestra, *FW: AER.EN.RP.06 - questions on the demand forecasts*, 3 May 2011, attachment 13-2 (confidential).
AER, *Draft decision*, February 2011, p. 173.

Figure 10.2: AER draft decision and revised proposal demand MDQ forecasts (GJ)



Source: Envestra, *FW: AER.EN.RP.06 - questions on the demand forecasts*, 3 May 2011, attachment 13-2 (confidential).
AER, *Draft decision*, February 2011, p. 173.

10.3 AER's consideration

In its draft decision, the AER accepted Envestra's residential customer numbers, C&I consumption and demand MDQ forecasts, but:[12]

- required an increase in the residential consumption forecast based on the historical rate of decline in average consumption
- rejected Envestra's proposal to reclassify large customers in the residential customer group to the C&I customer group, and the use of the resultant historical customer numbers and consumption data for forecasting demand.

Envestra responded to these two issues in its revised access arrangement proposal. Envestra also proposed to update the C&I consumption and demand MDQ forecasts accepted by the AER in the draft decision using more recent economic forecast.

The AER's consideration of these issues is as follows.

10.3.1 Residential customer numbers and consumption forecast.

In its draft decision, the AER rejected Envestra's proposal to reclassify large customers in the residential customer group to the C&I customer group, and the use of the resultant historical customer numbers and consumption data for forecasting demand. The AER reached this decision due to concerns regarding the lack of substantiation by Envestra of the reclassification methodology, and the lack of verification of the resultant historical customer numbers and consumption data. In response to these concerns, Envestra submitted a report prepared by PKF to support its reclassification methodology and the use the resultant historical data for forecasting demand.

The AER reviewed PKF's assessment report. The AER is satisfied that the material provided in the report sufficiently addresses the concerns raised in the draft decision because it:[13]

- provides sufficient explanation of the proposed reclassification methodology
- demonstrates that the revised historical customer numbers and consumption data is consistent with Envestra's stated reclassification methodology.

On this basis, the AER accepts that it is reasonable to use the revised historical data after the reclassification of customers for forecasting demand. Table 10.2 compares the historical consumption and customer numbers data before and after the reclassification.

[12] AER, *Draft decision*, February 2011, pp. 166–170.
[13] Envestra, *Revised Qld access arrangement proposal*, March 2011, attachment 13-2, p. 2 (confidential).

Table 10.2: Original and revised historical customer numbers and consumption data

		2005-06	2006-07	2007-08	2008-09	2009-10
Residential consumption - TJ	Original access arrangement proposal	668	637	677	730	720
	Revised access arrangement proposal	638	612	616	639	647
Residential customer numbers	Original access arrangement proposal	72838	74390	76307	78877	80674
	Revised access arrangement proposal	70712	72208	74852	77386	79431
C&I consumption - TJ	Original access arrangement proposal	1264	1247	1223	1248	1253
	Revised access arrangement proposal	1279	1272	1293	1334	1294
C&I customer numbers	Original access arrangement proposal	2731	2773	2753	2827	2831
	Revised access arrangement proposal	4891	4954	4208	4319	4395

Source: NIEIR, *Natural gas forecast for the Envestra Queensland distribution region to 2019-20*, September 2010.
Envestra, Email to the AER, *Revised Queensland History*, 2 December 2010 (confidential).

Envestra accepted the AER's draft decision on the residential consumption forecast and revised its forecast based on the historical trend of decline in average residential consumption. However, Envestra proposed to adjust the resultant forecast to account for demand responses to carbon and distribution network price increases.[14]

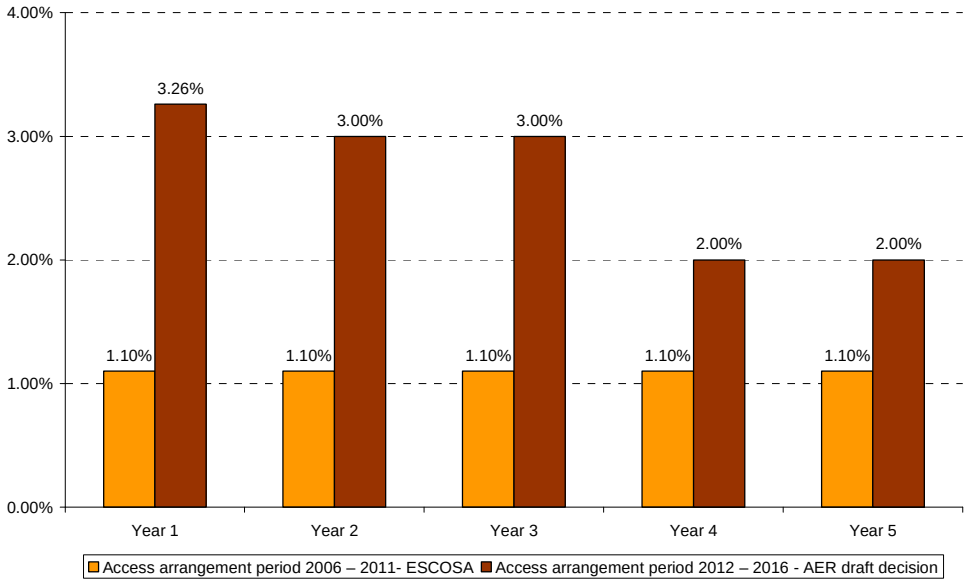
The AER accepts that it is reasonable to adjust the forecast to incorporate the impacts of carbon and distribution network price increases for the following reasons:

- the Australian Government's announcement confirming its intention to introduce a carbon pricing scheme in July 2012.[15]
- ACIL Tasman's advice that the timing and the quantum of the forecast increase in retail gas prices adopted by Envestra to account for the impact of a price on carbon is reasonable.[16]
- projection of the historical trend average residential consumption may not fully capture the demand responses from customers to retail gas price increases as the

14 Envestra, *Revised SA access arrangement proposal*, March 2011, attachment 13-2, p. 2.
15 Prime Minister of Australia, the Hon Julia Gillard, *Climate change framework announced*, February 2011.Viewed at http://www.pm.gov.au/press-office/climate-change-framework-announced.
16 ACIL Tasman, *Review of demand forecasts for Envestra Qld*, December 2010, pp. 10–11.

result of the price on carbon and the above trend increase in distribution network prices. Figure 10.3 shows the differences in real weighted average distribution price increases approved in the earlier access arrangement period and those approved in the AER's draft decision.

Figure 10.3: Earlier access arrangement period real weighted average distribution price increases, and the AER draft decision real weighted average distribution price increases for the access arrangement period



Source: Queensland Competition Authority, *Access Arrangement information for the Queensland Australian Gas Distribution System*, June 2006.
AER, *Draft decision*, February 2011, p. 158.

- the proposed approach to adjust the consumption forecast to incorporate the price impacts appears reasonable and is consistent with the approaches accepted in recent electricity distribution determinations.[17]

To test the reasonableness of the quantum of the adjustments for carbon and distribution network price increases, the AER assessed the assumed price elasticity used by Envestra to calculate the demand response to these price increases. Given the lack of a recent relevant study on the estimate of gas price elasticity in Queensland, the AER compared NIEIR's long run residential price elasticity against estimates produced by other studies based on national and international data, summarised in table 10.3 below.

[17] AER, Final decision, *South Australia distribution determination 2010–11 to 2014–15*, May 2010, AER, Final decision, *Victorian electricity distribution network service providers Distribution determination 2011–2015*.

Table 10.3: Comparison of gas consumption price elasticity estimates for residential customers

	Country	Short run	Long run
Envestra/NIEIR	Australia		-0.30
Julie Harman et al (1999)	Australia	-0.54	-0.65
Berkhout et al (2004)	Netherland	-0.19	-0.44
Mark A. Bernstein et al (2005)	United States	-0.12	-0.36
Anna Alberini et al (2010)	United States	-0.55	-0.69

Source: Julie Harman et al (1999), "Gas demand forecast and transmission and distribution tariffs", Australian Bureau of Agricultural and Resource Economics (ABARE)
Berkhout, P. et al (2004), "The ex post impact of an energy tax on household energy demand", Energy Economics, 26(3)
Mark A. Bernstein el at (2005), "Regional Differences in the Price-Elasticity of Demand For Energy", RAND Corporation
Anna Alberini et al (2010), "Residential consumption of gas and electricity in the US: What are the effects of prices and energy efficiency investments?", University of Maryland

NIEIR's assumed long run price elasticity appears to be consistent with those produced by other studies. The AER acknowledges the limitations of this comparative analysis due to geographical factors and time differences. However, the AER is unable to perform a regression analysis to estimate the elasticity based on historical data to compare against NIEIR's estimate. This is due to the fact that only 5 years of consistent data from 2005–06 to 2009–10 is available for analysis as a result of the revision to the historical data discussed earlier in this section.

As NIEIR's estimate is broadly in line with the estimates obtained in other studies, the AER considers that the assumed long run residential price elasticity of -0.30 is reasonable and represents the best estimate possible in the circumstances.

Although the AER accepts in principle the need to adjust the historical trend residential consumption forecast for network price increases, it does not accept the assumed network price increases used to calculate the adjustments. This is because the AER has amended the total revenue allowance proposed by Envestra for the access arrangement period. This results in lower distribution price increases, which lessens the demand response from customers. For this reason, the AER has adjusted the residential consumption forecast to the levels presented in table 10.4 based on the AER approved total revenue allowance.[18]

[18] See chapter 9 for a comparison of the approved and the proposal total revenue allowance.

Table 10.4: AER final decision residential demand forecasts

		2011–12	2012–13	2013–14	2014–15	2015–16
Residential customer numbers	Final decision	82921	85180	87459	89576	91752
Residential consumption - TJ	Final decision	653	656	657	657	659
	Revised proposal	651	649	647	645	645

Source: Envestra, Email to the AER, *RE: Revisions to demand forecasts to account for network price increases*, 8 June 2011.

10.3.2 C&I consumption and demand MDQ forecasts

In its draft decision, the AER accepted Envestra's C&I consumption and demand MDQ forecasts. However, due to the recent natural disasters (flooding and cyclone) in Queensland, Envestra proposed to update the C&I consumption and demand MDQ forecasts accepted in the draft decision using more recent economic forecasts. Envestra stated that the economic forecast used to develop the revised demand forecast is broadly in line with forecast prepared by the Queensland Treasury after the recent flooding.[19] This is confirmed by figures presented in table 10.5. On this basis, the AER accepts that the updated economic forecast adopted by Envestra is reasonable.

Table 10.5: Queensland Treasury and NIEIR GSP forecasts

	Queensland Treasury January 2011 forecast	Queensland Treasury September 2010 forecast	NIEIR March 2011 forecast	NIEIR September 2010 forecast
2010-11	1.25%	3.00%	1.20%	3.20%
2011-12	5.00%	4.25%	6.20%	5.70%

Source: Queensland Government, *Mid Year Fiscal and Economic Review 2010–11*, January 2011, p. 6 NIEIR, *Natural gas forecasts for the Envestra Queensland distribution region to 2020, An update*, March 2011, p. 2.

The Queensland Treasury included the direct impacts of the recent flood on the mining and agriculture sectors, as well as the flow on effects to other sectors of the economy in the updated economic forecast.[20] For this reason, the AER accepts Envestra's proposal to adjust the demand forecast based on the updated economic forecast, although the flood had limited direct impact on sectors to which Envestra has exposure.[21]

As for residential consumption, the AER accepts that the baseline forecasts should be adjusted to incorporate demand responses to carbon and distribution network price increases.

Envestra adopted a long run price elasticity estimate of -0.35 prepared by NIEIR to calculate the magnitude of the price adjustments for business customers. Based on its

19 Envestra, *Revised SA access arrangement proposal*, March 2011, attachment 13-2, p. 5.
20 Queensland Treasury Office , *Mid year fiscal and economic review 2010-11*, Jan 2011, pp. 6–10
21 Queensland Treasury Office , *Mid year fiscal and economic review 2010-11*, Jan 2011, pp. 6–10

review of material provided by Envestra, the AER accepts that the estimation method appears reasonable.[22] The AER also found that NIEIR's estimate is broadly in line with the indicative price elasticity estimate of -0.37 derived by the AER using Australian national gas consumption data released by Australian Bureau of Agricultural and Resource Economics (ABARE).[23] On this basis, the AER accepts that the assumed long run business customer price elasticity of -0.35 is reasonable and represents the best estimate possible in the circumstances.

Similar to the approach taken for the residential consumption forecast, the AER has adjusted the C&I consumption and demand MDQ forecasts to the levels presented in table 10.6 based on the approved total revenue allowance.[24]

Table 10.6: AER final decision Tariff C consumption and Tariff D MDQ forecasts

		2011-12	2012-13	2013-14	2014-15	2014-16
C&I consumption - TJ	Envestra revised proposal	1372	1408	1412	1427	1456
	AER final decision	1373	1413	1423	1443	1474
Demand MDQ - GJ	Envestra revised proposal	20566	20914	20802	20887	21261
	AER final decision	20572	20956	20895	21016	21403

Source: Envestra, Email to the AER, *RE: Revisions to demand forecasts to account for network price increases*, 8 June 2011.

10.4 Conclusion

The AER accepts the proposed demand forecasting approach in general appears reasonable, and that the revised residential customer numbers forecast as presented in table 10.4 is reasonable. However, the AER does not approve Envestra's proposed demand forecasts as they do not meet the requirements of r. 74 of the NGR.

The AER considers that it is necessary to revise the network price adjustments applied to the residential consumption, C&I consumption and demand MDQ forecasts to reflect the approved total revenue allowance. The AER considers that the adjusted forecasts as set out in tables 10.4 and 10.6 represent the best forecasts available in the circumstances.

10.5 Revisions

The AER proposes the following revision:

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22 Envestra, *FW: AER.EN.RP.06 - questions on the demand forecasts*, 3 May 2011, (confidential).

23 The estimate is derived based on a regression analysis using data sourced from
ABARE, *Australian energy statistics, Australian energy consumption, by industry and fuel type – energy units table f8*, access from
http://www.abare.gov.au/publications_html/energy/energy_09/F_09.xls
AER, *State of the energy market 2010*, December 2010
ABS, Cat: 5220.0, *Australian National Accounts: State Accounts 2009-10*, November 2010
The estimated national business gas price elasticity is -0.37 with a 95 confidence interval for the estimate range from -0.17 to -0.58. This estimate is intended to be used as a high level check only.

24 See chapter 9 for details on the total approved revenue allowance.

Revision 10.1: amend the access arrangement information to delete Table 13.2 and replace it with the following table:

Table 10.7: AER final decision on Envestra's demand forecasts

30 June end	2011–12	2012–13	2013–14	2014–15	2015–16
Tariff R consumption (TJ)	653	656	657	657	659
Tariff R customer numbers	82921	85180	87459	89576	91752
Tariff C consumption (TJ)	1373	1413	1423	1443	1474
Tariff C customer numbers	4557	4641	4649	4672	4726
Tariff D MDQ demand (GJ)	20572	20956	20895	21016	21403
Tariff D customer numbers	72	73	73	73	74

11 Reference tariffs

An access arrangement is required to set out how a service provider intends to charge for reference services. The NGR requires that the basis for setting reference tariffs be explained. This is done by defining the tariff classes and comparing the revenue to be raised by each reference tariff with the cost of providing service to each tariff class.

In its draft decision, the AER accepted the tariff structure proposed by Envestra, which includes two zonal domestic tariffs, two zonal commercial tariffs, three zonal demand tariffs, and three ancillary services tariffs proposed by Envestra. However, the AER had concerns with the detail of how these tariffs were determined and applied.

Envestra's revised access arrangement proposal has addressed many of the concerns raised in the AER's draft decision. However, the AER proposes to remove the additional 50 GJ criterion for identifying demand haulage reference service customers.

This chapter presents the revised tariffs for 2011-12, reflecting the AER's proposed revisions to revenues and demand set out in this decision.

11.1 Regulatory requirements

With respect to reference tariffs, the NGR requires Envestra to:

- specify the tariffs for each reference service (r. 48(1)(d)(i) and (ii))
- demonstrate that total revenue is allocated between reference and other services on the basis of costs allocated according to certain principles (r. 93(1) and (2))
- divide reference service customers into tariff classes (r. 94(1)) that are economically efficient and avoid unnecessary transaction costs (r. 94(2))
- describe the proposed approach to the setting of tariffs, including the method used to allocate costs, and demonstrate the relationship between tariffs and costs and provide a description of any applicable pricing principles (r. 72(1)(j))
- demonstrate that revenue expected from each tariff class is within certain lower and upper thresholds (r. 94(3))
- demonstrate that each tariff and its charging parameters must take into account long run marginal costs, transaction costs and customer responses to price signals (r. 94(4))
- demonstrate that prudent discounts offered to customers are necessary for competition or efficiency reasons and that this will likely lead to lower tariffs for other customers (r. 96).

11.2 Revised access arrangement proposal

In its draft decision, the AER required various amendments regarding Envestra's propose tariffs. These amendments related to:

- tariff classes
- allocation of total revenue to tariff classes
- tariff class revenues and parameters
- prudent discounts
- the tariffs for 2011-12.

Envestra's response to these amendments follows.

11.2.1 Tariff classes

In its revised access arrangement proposal, Envestra responded that its tariffs were cost reflective and that it developed its tariff classes by allocating costs to:

- the geographic zone in which customers are located
- the type of connection (e.g. residential, commercial and industrial), and
- the customer's usage profile.

Envestra proposed the introduction of two separate volume tariffs for residential and commercial and industrial customers in Queensland to replace the existing single volume tariff. Envestra argued that its proposal promotes economic efficiency as it recognises the different usage profiles of residential and commercial and industrial customers. Envestra stated that any required IT changes to allow for the separation of the volume tariffs will be minimal and that it has not sought any additional funding for this purpose.

Envestra proposed that if a customer consumes more than 50 GJ for any particular day during the year, that customer would be treated as a demand customer regardless of its total consumption during the year. Envestra stated that there could be instances where a small number of customers may not meet the annual 10 TJ threshold for a demand customer, yet it is appropriate to include these customers within the demand tariff categorisation. Envestra observed that some volume customers may draw large volumes of gas over a short period of several hours, with a peak load eclipsing that of some smaller demand customers. Envestra argued that not treating such customers as demand customers has been a design flaw within the tariffs for some time. It argued that it would not be appropriate to accede to the AER's preferred position of maintaining the status quo.

Envestra recognised that some retailers were concerned that the above may entail the rollout of new interval meters to some customers, to determine whether they meet the 50 GJ criterion. Envestra advised that this will not be the case, that is, no additional interval meters will be installed for checking purposes. In practice, the 50 GJ criterion

will only affect new customers or customers requesting increased capacity of gas supply. Envestra also stated that there will be no separate cost involved for these customers, as the provision of interval meters are part of the demand service.

Envestra stated that it had considered at length whether to reduce the number of steps for commercial and industrial customers and demand customers. However, it did not pursue this on the basis that to do so would distort the price signals being sent to customers as it considers that the need for tariffs to send clear and appropriate price signals to customers offers greater long term benefits to both Envestra and its customers than any benefits realised through the reduction of tariff complexity.

11.2.2 Allocation of total revenue to tariff classes

Envestra stated its cost allocation model for Queensland disaggregates the annual revenue requirement calculated by the PTRM into two distinct categories of ancillary services and reference services in accordance with the requirements of r. 93(2) of the NGR. Specifically:

- the revenue from ancillary services recovers the directly attributable costs associated with the provision of those services only
- the revenue from reference services recovers the directly attributable costs associated with the provision of these services, including dedicated assets used in the provision of those services
- the allocation of costs to the return on asset, depreciation and opex building blocks for reference services is performed based on the relative proportion of the capital and operating costs associated with the provision of particular reference services
- the revenue for each ancillary reference service is allocated based on the pro-rata of the ancillary reference service's total costs to the total cost of all ancillary reference services
- the individual building block costs for reference services are calculated as the difference between the total individual building blocks (from the PTRM) and the cost reflective revenue from ancillary services.

Envestra then allocates costs directly attributable to the reference services provided to network users within each tariff class in accordance with the methodology set out in the access arrangement information 14-1, section 2.4.

Envestra stated it had met r. 93(2) of the NGR in establishing the costs and revenues for reference services, ancillary services and negotiated services. Envestra also observed that the revenues from negotiated services reflect the costs of providing these services and that no revenue or costs are allocated between negotiated services and reference services.

Discussion of ancillary services in the cost allocation description is set out in section 14.4 of Envestra’s access arrangement information.

11.2.3 Tariff class revenues and parameters

Envestra stated that its reference tariffs were developed such that the revenue recovered from each tariff class was more than the avoidable cost of serving that tariff class and lesser than the standalone cost of serving each tariff class. Envestra also stated that Table 14.2 of its access arrangement information demonstrated these outcomes. Envestra therefore considered that it is compliant with Rule 94(3) of the NGR and clause 2.6.2.1(h) of the RIN. Envestra also stated that the tariffs were developed having regard for transaction costs as set out in section 14.8 of its access arrangement information.

Envestra noted that the tariffs for each ancillary service reflected the cost incurred by the third party service provider in providing each service. In relation to transaction costs for ancillary services, Envestra stated that these were minimised because each tariff is based on a single fixed rate per service, regardless of where the service is performed or the time or date when the service is performed. In relation to customer responses, Envestra considered that its tariff design for ancillary services adequately sends price signals to customers.

Envestra stated that its reference tariffs were designed in order to have regard to LRMC and the need to signal the relationship between demand and new investment. This is discussed in section 14.6.5 of its access arrangement information.

Having had regard to the standalone costs, avoidable costs, long run marginal costs (LRMC) and transaction costs in developing each tariff class, Envestra considered that it has satisfied the requirements of r. 72 (1) (j) (i) in the NGR.

11.2.4 Prudent discounts

In response to the draft decision, Envestra again proposed to offer discounts to four customers in response to the risk of network bypass on the basis that the customers:

- are at risk of potentially bypassing the network if they are not offered the discount
- make a contribution to the pool of shared costs, such that reference tariffs are lower than they would be if the users bypassed the network.[1]

11.2.5 Tariffs for 2011-12

Envestra provided revised tariffs for 2011-12. These revised tariffs reflected the various changes Envestra made relative to the AER's draft decision.

11.3 Summary of submissions

AGL Energy Limited (AGL) stated that the proposed residential tariff represents a significant increase on network charges applying to residential customers. AGL calculated that residential sites in the Brisbane and Riverview zones will be paying an effective $51.66 for the first 0.2G GJ per day in 2011-12, an increase of 240 per cent. AGL also calculated that commercial tariffs would increase by 21.6 per cent for the first 0.2 GJ per day in 2011-12. AGL stated that there is little evidence furnished to

[1] Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 14 -3 (confidential).

underpin such a dramatic increase in tariffs applying to residential supply points, other than a vague statement to the effect that residential and commercial customers have "different usage profiles" and no acknowledgment of the price shock to users and customers and how that might be managed.[2]

AGL proposed that the current demand and volume customer classification be retained. AGL stated that it had been unable to locate any additional justification that was sought by the AER in chapter 11 of the draft decision.[3]

11.4 AER's consideration

The AER considered that Envestra's original proposal in respect of the description of reference tariffs was largely compliant with the requirements of the NGR. However, there where several aspects of the original proposal that did not meet the requirements of the NGR. Envestra was required to:[4]

- demonstrate that Envestra has had regard to economic efficiency and transaction costs in proposing the new basis for categorising volume and demand customers
- demonstrate that revenue is allocated between reference and other services in the ratio in which costs are allocated between reference and other services
- demonstrate that costs are allocated between reference and other services according to r. 93(2) of the NGR
- include discussion of ancillary services in the cost allocation description
- demonstrate the relationship between costs and tariffs, including for ancillary services
- include consideration of transaction costs and customer responses for ancillary services
- address how tariffs for ancillary services take account of LRMC
- explain why prices for "project specific agreements" are discounted (having regard to r. 96(2)(a) of the NGR) and demonstrate how all proposed discounted prices are likely to lead to reference tariffs being lower than otherwise.

The AER required amendments to rectify these issues. Envestra's revised access arrangement proposal has satisfactorily addressed most of these issues. However, the AER does not accept the additional 50 GJ criterion for identifying demand haulage reference service customers. In addition, the tariffs for 2011-12 still require revision from those proposed by Envestra, due to the revisions to revenues and demand proposed by the AER as set out in this decision.

2 AGL, Submission to draft decision, 27 April 2011, p. 1.
3 AGL, Submission to draft decision, 27 April 2011, p. 1.
4 AER, *Draft Decision*, p. 182.

11.4.1 Accepted changes

The AER accepts Envestra's allocation of revenues and costs between reference services and negotiated services as being consistent with r. 93 of the NGR. The additional information provided by Envestra has clarified this matter.

The AER accepts Envestra's demonstration of the relationship between costs and tariffs and the description of how ancillary services are determined as being consistent with r. 72(1)(j)(i) of the NGR. Envestra stated that the tariffs for ancillary services reflected the costs incurred by a third party service provider in the provision of each service.[5] This discussion has been included in Envestra's access arrangement information and attachment 14.3 to its revised access arrangement proposal.

The AER accepts Envestra's assessment of the transaction costs of having two separate tariff classes for volume customers to be consistent with 94(4) of the NGR. Envestra advised it was seeking no additional funding due to this change.[6] The AER does not agree with AGL that no additional information was provided by Envestra to support the separation of volume tariffs between residential and commercial customers.

The AER accepts Envestra's additional discussion on the transaction costs and customer responses regarding the charging parameters for ancillary services under r. 94(4) of the NGR. The AER also accepts Envestra's additional discussion on how the charging parameters for ancillary service tariffs take account of long run marginal costs under r. 94(4) of the NGR. While Envestra could not quantify the LRMC, it did discuss the charging parameters it developed to effectively signal LRMC to network users.[7]

The AER accepts that Envestra's proposed discounts are prudent and consistent with r. 96 of the NGR. The AER has considered each of the proposed discounts individually, with regard to Envestra's updated analysis, and made its decision based on the following:

- having considered the information provided in Envestra's original proposal, the AER was satisfied that, of the eight discounts, four discounts are in response to potential bypass of the network[8]

- considering Envestra's revised access arrangement proposal, the AER is satisfied the proposed 'project specific agreement' discounts are all offered in response to potential bypass of the network[9]

- in response to the draft decision, Envestra provided updated analysis demonstrating that all four users' projected revenue including the proposed discounts individually exceed the costs of their dedicated assets[10]

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5 Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 14 -3 pp. 5-6.
6 Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 14 -3 p. 4.
7 Envestra, *Revised Qld access arrangement information*, March 2011, p. 204.
8 Envestra, *Qld access arrangement information*, October 2010, Attachment 12-1 (confidential).
9 Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 14 -3 (confidential).

- this additional analysis shows that all eight users are making a contribution to the pool of shared costs, which implies the reference tariff is lower than would be the case if the users bypassed the network

11.4.2 Further revisions

11.4.2.1 Tariff classes

The AER doe not accept the additional 50 GJ criterion for identifying demand haulage reference service customers. The AER considers that if capacity management is an issue, then extending demand charges to more customers may be a sensible approach. However, Envestra did not provide any evidence to support this claim.

The AER is mindful that Origin and AGL raised a number of concerns regarding the implementation of Envestra's proposed approach in response to Envestra's original proposal. Origin was concerned that customers with annual consumption less than 10 TJ but with MDQ greater than 50 GJ would not easily be identified in its current business systems, which would cause billing problems. Also, it was unclear to Origin whether such customers would be moved onto interval metering and, if they were, whether network users would be able to pass on the cost of the new meter.

Envestra responded to some of these concerns in its response to the draft decision. However, the AER considers that Envestra's response does not satisfactorily address these concerns. Envestra indicated that the criterion will only apply to new customers or those seeking to upgrade capacity. In the AER's view, this suggests that there is no significant issue in terms of existing customers. Envestra stated that customers captured by this criterion will not pay a separate charge for an interval meter. However, the AER considers that this does not mean that the customer will not ultimately meet the cost of this additional equipment through the demand charges. Envestra did not address at all the administrative implications of re-introducing this approach. The AER notes that Envestra had previously noted that this approach was dropped in its earlier access arrangement period in order to simplify administration arrangements.[11] The AER therefore considers that its reintroduction could increase administrative costs.

The AER raised the same concerns with APT Allgas, which originally proposed a similar criterion without sound justification. APT Allgas subsequently removed the additional criterion from its revised access arrangement proposal accepting that such a criterion raised administrative issues given the relatively small number of customers affected.

Based on the considerations above, the AER considers the transaction costs of Envestra's proposed MDQ criterion for volume customers are not consistent with r. 94(2) of the NGR.

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10 Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 14-3 (confidential).

11 Envestra, *Access arrangement information*, September 2010, p. 41.

11.4.2.2 Tariffs for 2011-12

The AER proposes to recalculate the tariffs for 2011-12 from those proposed by Envestra. These tariffs reflect the various revisions proposed by the AER which are set out in this decision. The AER notes AGL's concerns regarding rebalancing of the 2011-12 tariffs. Chapter 12 discusses the issue of rebalancing in the context of annual tariff variations.

11.5 Conclusion

The AER considers that the tariffs proposed by Envestra meet many of the requirements of the NGR, including r. 48(1)(d)(i), r. 72(1)(j)(i), r. 93, r. 94(1), r.94(4) and r. 96. However, the AER does not approve the following aspects of Envestra's access arrangement proposal, as they do not comply with the NGR:

- all reference tariffs—all reference tariffs require amendment to reflect amendments to total revenue and demand set out in chapters 9 and 10
- definitions of demand and volume customers based on consumption and demand—Envestra's access arrangement proposal does not comply with r. 94(2) of the NGR.

To address each of these, the AER proposes the revisions set out in section 11.6.

11.6 Revisions

The AER proposes the following revisions:

Revision 11.1: remove the additional 50 GJ criterion for identifying demand haulage reference service customers.

Revision 11.2: delete tables 1–3 of Annexure B of the revised access arrangement and replace with following updated tables:

Table 1: Tariff R (Domestic Haulage Reference Service) - GST exclusive dollars

Charges	Brisbane & Riverview Zone	Northern Zone
Fixed Charge ($/day)	0.36	0.36
For the first 0.0082 GJ of Gas delivered during a network day	23.63	25.97
For the next 0.0192 GJ of Gas delivered during a network day	16.87	18.54
All additional GJ of Gas delivered during a network day	8.02	8.80

Table 2: Tariff C (Commercial Haulage Reference Service) - GST exclusive dollars

Charges	Brisbane & Riverview Zone	Northern Zone
Fixed Charge ($/day)	0.33	0.33
For the first 0.2 GJ of Gas delivered during a network day	17.34	19.04
For the next 0.3 GJ of Gas delivered during a network day	15.82	17.42
For the next 0.5 GJ of Gas delivered during a network day	15.35	16.87
For the next 1.0 GJ of Gas delivered during a network day	14.55	16.05
For the next 5.0 GJ of Gas delivered during a network day	12.74	13.87
All additional GJ	9.56	10.49

Table 3: Tariff D (Demand Haulage Reference Service) - GST exclusive dollars

MDQ at delivery point	Tariff Zone		
	Brisbane	Northern	Riverview
50 GJ or less ($/GJ)	8,981.10	9,672.67	8,461.30
Plus $/GJ of MDQ			
Next 75 GJ	84.58	92.89	8.91
Next 150 GJ	46.59	50.85	8.53
Next 250 GJ	18.61	20.15	7.83
Next 500 GJ	8.49	9.06	7.79
Next 10,000 GJ	4.30	4.71	7.76
Additional GJ	4.30	4.71	7.76

12 Tariff variation mechanism

An access arrangement is required to set out how tariffs may be varied during the access arrangement period. Envestra has proposed a tariff variation mechanism that allows tariffs to be adjusted by inflation and, where applicable, an X factor each year. In addition, Envestra has proposed a mechanism for adjusting tariffs in the event of an approved cost pass through.

The purpose of the tariff variation mechanism is, amongst other things, to permit the building block revenues to be recovered over the access arrangement period smoothly and to take account of actual inflation.

The AER approves the tariff variation mechanism proposed by Envestra as complying with r. 92(2) of the NGR. However, it has varied the value of the Y factor in the rebalancing formula. The X factors have also been revised to reflect the changes to the forecast total revenue identified in other chapters of this decision.

Envestra has broadly accepted the cost pass through mechanism as specified in the draft decision, but has proposed a number of further revisions. The AER has accepted several of these proposed revisions, and a number of applicable revisions proposed by APT Allgas in its simultaneous access arrangement proposal where the AER considers the revisions better promote the requirements of the NGR and NGL.

Certain requirements of the annual tariff approval process have bee revised by the AER. The proposal for the coming tariff year must be lodged 50 business bays before the end of the current tariff year. The quantity data used in the variation formulas must be audited.

12.1 Regulatory requirements

Rule 72(1)(k) of the NGR requires that the access arrangement information for a full access arrangement proposal must include the service provider's rationale for any proposed reference tariff variation mechanism.

Rule 92(1) of the NGR requires that a full access arrangement must include a mechanism for variation of a reference tariff over the course of an access arrangement period. Rule 92(2) of the NGR provides that the reference tariff variation mechanism must be designed to equalise in present value terms forecast revenue from reference services over the access arrangement period and the portion of total revenue allocated to reference services for the access arrangement period.

Rule 97(1) of the NGR requires that a reference tariff variation mechanism may provide for variation of a reference tariff in accordance with a schedule of fixed tariffs; or in accordance with a formula set out in the access arrangement; or as a result of a cost pass through for a defined event; or a combination of 2 or more of these operations.

Rule 97(2) of the NGR provides that a formula for variation of a reference tariff may (for example) provide for variable caps on the revenue to be derived from a particular combination of reference services; or tariff basket price control; or revenue yield control; or a combination of all or any of these factors.

In deciding whether a particular reference tariff variation mechanism is appropriate to a particular access arrangement, the AER must have regard to the various factors in r. 97(3) of the NGR including the need for efficient tariff structures; and the possible effects of the reference tariff variation mechanism on administrative costs; and the regulatory arrangements (if any) applicable to the relevant reference services; and the desirability of consistency between regulatory arrangements for similar services; and any other relevant factor.

Rule 97(4) of the NGR requires that a reference tariff variation mechanism must give the AER adequate oversight or powers of approval over variation of the reference tariff.

12.2 Revised access arrangement proposal

In its draft decision, the AER required various amendments regarding Envestra's propose tariff variations. These amendments related to:

- The annual tariff variation mechanism
- The cost pass-trough mechanism
- The process for annual tariff variation approval

Envestra's responses to these matters follow.

12.2.1 Annual tariff variation mechanism

12.2.1.1 Revenue equalisation

Envestra revised the X factors in the tariff control and rebalancing formulas based on the various changes it had made to its revised proposal, consistent with r. 92(2) of the NGR.

12.2.1.2 Tariff control and rebalancing formulas

Besides revising the X factors, Envestra made not further change to the control formula approved in the AER's draft decision.

Envestra rejected the AER's draft decision that the Y factor for the rebalancing (side constraint) formula should be 2 per cent. It proposed that the Y factor for the side constraint formula should be 10 per cent or at least no less than 5 per cent.[1] Envestra considered that the AER's draft decision of a Y factor of 2 per cent, as distinct from Envestra's proposal of 10 per cent:

- is impractical in the context of ordinary pricing requirements;
- is inconsistent with the AER's position in recent decisions;
- adopts an electricity industry framework which does not have the variations in volumes experienced in the natural gas industry; and

[1] Envestra, *Revised Qld access arrangement information, Attachment 15-2*, March 2011.

- hinders Envestra's ability to rebalance its tariffs, which directly inhibits the incentive powers within the control mechanism selected for Envestra, being a weighted average price cap and not a price cap.

Envestra stated that it currently has an ability to utilise rebalance tariffs, subject to side constraints, to ensure that it remains able to recover its allowed revenue when volume changes occur. These volume changes occur for a range of reasons, being economic (customers closing facilities) or environmental (weather patterns leading to lower demand for heating loads) and are part of the ordinary operation of a gas distribution business. The choice of a weighted average price cap control mechanism allows Envestra to follow these loads, adjusting tariffs when volumes change in order to ensure that all customers continue to pay for the return on and of the network and operating costs overall.

Envestra also argued that the electricity industry, as distinct from the gas industry, experiences reasonably stable growth in demand and volume, both of which invariably rise and have risen over the last 20 years in a demonstrable way. Natural gas, however, being a fuel of choice, being heavily dependent on the foresight of developers and being directly correlated to economic growth and weather patterns, experiences significant variability from year to year. Envestra stated that the AER's adoption of a 2 per cent side constraint is therefore inappropriate and beyond any reasonable basis of support.

Envestra argued that the AER has an obligation under r. 97(3) of the NGR, in deciding whether a particular reference tariff variation mechanism is appropriate to a particular access arrangement, to have regard to:

- the regulatory arrangements (if any) applicable to the relevant reference services before the commencement of the proposed reference tariff variation mechanism; and

- the desirability of consistency between regulatory arrangements for similar services (both within and beyond the relevant jurisdiction).

The current regulatory arrangements provide for a side constraint value of 2.5 per cent, which Envestra suggested had caused considerable issue for it in rebalancing its tariffs and has not allowed Envestra to use the WAPC to rebalance its load. Envestra stated that the AER, in making its decision, has not considered the background information provided by Envestra in relation to its issues with the current 2.5 per cent constraint, nor the gas industry specific reasons for allowing the 10 per cent value for Jemena, which are relevant for Envestra.

12.2.2 Cost pass through mechanism

Envestra broadly accepted the AER's approach to the cost pass throughs, and incorporated many of the AER's required revisions[2]. However, Envestra proposed further revisions to:

[2] Envestra, *Revised Qld access arrangement proposal*, March 2011.

- the materiality threshold: event costs should be assessed against the smoothed forecast revenue in the year the costs are first incurred.

- the procedure for cost pass through event variations: Envestra should notify the AER of cost pass through events when event costs when they are known or can be estimated.

- definitions of specific cost pass through events :

    - insurance cap event – delete the following words from the definition: "this event excludes all costs incurred beyond an insurance cap that are due to Envestra's negligence, fault, or lack of care".

    - network user failure event – add the words 'becomes insolvent or' after the words 'whereby an existing network user'.

    - regulatory change event - delete the word 'substantially' from the definition

    - service change event - delete the word 'substantially' from the definition

Envestra also proposed to include a new 'Insurer Insolvency' event, defined as: "an 'insurer insolvency event' means the insolvency of an insurer resulting in material losses to Envestra as a result of unsatisfied claims".

12.2.3 Annual tariff variation approval

12.2.3.1 Submission date

Envestra does not support the AER's draft decision that would require Envestra to notify the AER of a tariff variation 50 days prior to commencement. Envestra proposed a continuation of the current 35 business days. Envestra argued that the AER's draft decision is not consistent with r. 97(3)(b) of the NGR which require the AER to have regard to "the possible effects of the reference tariff variation mechanism on administrative costs of the AER, the service provider, and users or potential users". In considering its position on this issue, Envestra charges that the AER has had regard only for its own administrative costs.

Envestra acknowledged that the proposed 20 business days may not give the AER sufficient time to consider tariff variations. However the proposed submission date of around 15 April is before the date at which the ABS releases the March Quarter CPI (normally late April). Envestra claimed that this timing is unworkable and denies it the opportunity to properly consider changes to reference tariffs in submitting those changes to the AER. This is not an efficient outcome having regard for the administrative costs of preparing the same submission twice.

Envestra proposed a continuation of the current 35 business days. Envestra stated that this would provide it with approximately 8 business days from the release of the March CPI to prepare a submission and the AER at least this amount of time to approve those tariffs.

12.2.3.2 Auditing requirements

Envestra rejected the requirement that it provide an audited statement to support the gas quantity inputs in the tariff variation formula. It argued that this decision is not consistent with r. 97(3)(b) of the NGR which require the AER to have regard for "the possible effects of the reference tariff variation mechanism on administrative costs of the AER, the service provider, and users or potential users". Envestra stated that the AER had not had regard to Envestra's administrative costs. Envestra also notes that:[3]

- Past annual tariff adjustments have been approved by the AER without the requirement of independently audited/verified quantities – Envestra is unaware of any issues with the quality of this data as no concerns have ever been raised by the AER to date; and

- The requirement for an audit or verification of quantities is a new administrative cost (approx $15,000 - $20,000 per annum per network) to be borne by Envestra customers without any recognisable public benefit nor any identifiable issue with the current data that requires such an audit.

12.2.3.3 Provision of quarterly data

Envestra rejected the draft decision requirement that it provide annual data in quarterly form. Envestra argued that the draft decision is not consistent with r. 97(3)(b) of the NGR which require the AER to have regard for "the possible effects of the reference tariff variation mechanism on administrative costs of the AER, the service provider, and users or potential users". In considering its position on this issue, the AER has not had regard for Envestra's administrative costs. Quarterly data serves no purpose in the tariff variation mechanism and imposes an increased administrative burden on Envestra which is not justifiable. A single annual value is sufficient for the tariff approval process and has been used in each of the past AER decisions for Envestra. If quarterly data is required, and the effort in providing this should not be underestimated, then the reasons for this data should be clearly established by the AER. Envestra therefore proposes that the AER remove this requirement having had regard for r. 97(3)(b) of the NER.[4]

12.2.3.4 Rounding convention

In response to Amendment 12.4, Envestra submitted that:[5]

- Tariffs for reference services will to be rounded to two decimals; and

- Tariffs for ancillary services will be rounded such that:

    - Where the tariff for an ancillary service (as varied) is less than $20, the reference tariff (as varied) will be rounded to the nearest 10 cents (with five cents rounded upwards)

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3 Envestra, *Revised Qld access arrangement information, Attachment 15-2,* March 2011, p.3.
4 Envestra, *Revised Qld access arrangement information*, Attachment 15-2, March 2011, p.4.
5 Envestra, *Revised Qld access arrangement information*, Attachment 15-2, March 2011, p.4.

- Where the tariff for an ancillary service (as varied) is $20 or more, the Reference Tariff (as varied) will be rounded to the nearest dollar (with 50 cents rounded upwards).

12.3 AER's consideration

In its draft decision, the AER required various amendments regarding Envestra's propose approach to tariff variations. These amendments related to:

- The annual tariff variation mechanism
- The cost pass through mechanism
- The approval process for annual tariff variations

These matters are discussed below. No submissions were received in respect of these matters.

12.3.1 Annual tariff variation mechanism

12.3.1.1 Revenue equalisation

The AER considers that Envestra's annual tariff variation mechanism does not comply with r. 92(2) of the NGR, as the X factors for reference services must be amended as set out in revision 12.1. The revised X factors reflect the changes to forecast total revenue in the access arrangement period which occurs as a result of changes to the building block components that make up total revenue.[6] Further, amendment in forecast revenue is required to reflect changes to forecast demand. The changes in total revenue are outlined in the total revenue chapter 9 and changes to forecast demand are outlined in the demand chapter 10 of this draft decision.

12.3.1.2 Tariff control and rebalancing formulas

The AER accepts Envestra's control formula, subject to the revisions to the X factors as discussed above.

The AER considers that that a Y factor of 2 per cent is appropriate for the rebalancing (side constraints) formula. Envestra is regulated under a weighted average price cap (WAPC). A WAPC, as Envestra notes, is not a simple price path and therefore allows for some rebalancing of tariffs. However, a WAPC is also not a revenue cap. Under a WAPC a service provider is still exposed to the risk that forecast demand will be greater or lesser that what was expected at the time of the reset. Other things being equal, Envestra can receive greater revenues than were forecast under a WAPC where actual demand exceeds that which was forecast. Conversely, it will earn lower revenues than expected if demand is less than had been forecast. Envestra naturally wishes to minimise adverse outcomes from forecast errors.

How restrictive the side constraints should be is a matter of judgement for the AER. The side constraints are applied over a WAPC to limit a service provider's ability to rebalance tariffs, so as to provide some pricing certainty for customers. If Envestra were regulated under a simple price path, there would be no need for any side

[6] NGR, r.76.

constraints and, subject to within period changes (for example, inflation), customers would have pricing certainty for the access arrangement period. How restrictive the side constraints should be therefore requires balancing the service provider's and customers' respective concerns.

The AER's judgement on the side constraints has been formed by considering various issues, including:

- The side constraints only apply four out of the five years of the access arrangement period. To encourage consistency with the regulation of electricity businesses the AER considers that the side constraints should not apply in the first year of the regulatory period. This provides significant scope for rebalancing of tariffs.

- Envestra proposed rebalancing tariffs in 2011-12 to recover more from fixed, as opposed to variable, charges. This change has been accepted by the AER and has reduced the risk of the consumption of gas users falling.[7] As noted in chapter 11, AGL submitted that for the first 0.2 GJ per day, the residential tariff will increase 240 per cent in 2011-12, while the commercial tariff is increasing by 21.6 per cent for the first 0.2 GJ per day in 2011-12.[8] In response, Envestra considered that AGL had made an error in its calculations and stated the maximum impact would be 16.5 per cent for those customers with very low gas consumption (likely to be "cooker only" customers).[9] Based on the revised 2011-12 tariffs in this decision, the AER has determined that fixed charges for volume customers (both residential and commercial) will rise by 22 per cent regardless of consumption.[10]

- Envestra proposed a new volume class for commercial and industrial customers from 1 July 2011. This change has been approved by the AER in response to Envestra's concerns regarding rebalancing in the earlier access arrangement period. This change will allow Envestra to rebalance its volume tariffs more than it was able during the earlier access arrangement period. Envestra acknowledged this outcome suggesting the change would improve its ability to respond to changes in customer behaviour over time.[11]

- The Y factor used for Envestra during the earlier access arrangement period was 2.5 per cent. Envestra proposal represents a four fold loosening of this constraint. While 2 per cent is on the face of it a tighter constraint, this change is not as significant in relative terms and needs to be assessed against other considerations.

- While electricity demand for electricity may be rising more significantly than gas, this does not mean that the side constraints for gas and electricity need to be different. The risk faced by a service provider under a WAPC is that demand will differ from forecast, not the trend in the forecasts themselves. In assessing Envestra's demand forecasts in chapter 10, the AER took account of expected

7 AER, *Draft Decision*, p.180.
8 AGL, Submission to the draft decision, 27 April 2011, p.1.
9 Envestra, Email to the AER, *FW: Response to AGL submission on the Envestra Queensland revised Access Arrangment proposal*, 17 May 2011.
10 The fixed charges for 2010-11 were $0.296 per network day, based on a $0.236 fixed supply charge plus a $0.06 fixed FRC charge.
11 Envestra, *Revised Qld access arrangement information*, Attachment 14-3, March 2011, p.3.

trends in gas consumption. These expectations have effectively been embodied in the X factors that have been determined. The AER has no reason to believe that variations against these demand forecasts are likely to be any greater, or biased in a particular direction, than the variations faced by an electricity distributor.

- As noted by Envestra above, there can be a variety of reasons for changes in demand and some of these causes may be beyond Envestra's control. Rebalancing tariffs is one way to manage the potential downside risk. How Envestra plans and operates it network are other ways it can mitigate negative demand outcomes. The AER would not wish to discourage Envestra's efforts in these areas.

- While the AER approved a Y factor of 10 per cent for Jemena, the AER has been refining its view on the application of side constraints as it has taken on the responsibility for additional jurisdictions. The AER will continue to review the application of side constraints as it assesses the outcomes across all jurisdictions. The Y factor is 2 per cent for all electricity DNSPs. APT Allgas in its revised access arrangement proposal accepted the AER's draft decision of a Y factor of 2 per cent.

Based on the considerations above, the AER consider that a Y factor of 2 per cent is appropriate. It provides Envestra with sufficient scope to rebalance its tariffs, while providing reasonable pricing certainty for customers, at least for the final four years of the access arrangement period.

12.3.2 Cost pass through mechanism

The AER's considerations on Envestra's proposed revisions are set out as follows:

- specific event definitions
  - insurance cap change event
  - insurer insolvency event
  - network user failure event
  - regulatory change event
  - other event definition issues
- procedure for cost pass through event tariff variations
- materiality threshold

12.3.2.1 Specific event definitions

Envestra has made many of the amendments required by the AER in its draft decision, but has subsequently proposed several further revisions. Except for the insurer insolvency event, the AER rejects all of Envestra's proposed revisions. In addition, the AER has made a number of revisions proposed by APT Allgas in its ongoing access arrangement review.[12] In effect, these revisions will apply to both businesses.

[12] APT Allgas, *Revised access arrangement proposal*, March 2011, pp. 98–99.

The AER considers that this approach will result in a cost pass through framework that best promotes the national gas objective and the revenue and pricing principles.[13] A summary table of the revisions is provided in section 12.5. The AER's final amendments to specific events are set out in revision 12.3.

In its submission, Jemena identified that Envestra referred to both the specific cost pass through events and events prompting mid-period reviews of the access arrangement as 'trigger events'.[14] The term 'trigger events' appears in r. 51 of the NGR, which provides that an access arrangement review date can be brought forward by the occurrence of specific 'trigger events'. Cost pass throughs and the review of access arrangement are two separate mechanisms designed for different regulatory purposes. Therefore, the AER considers that in the context of tariff variation mechanism, references should be made to 'cost pass through events' rather than 'trigger events'. This distinction will promote a clearer and more transparent cost pass through mechanism, which is in the long term interests of users, prospective users and Envestra.

Insurance cap event

The AER does not accept Envestra's revised access arrangement proposal to exclude insurance costs over Envestra's insurance policy limit that arise as a result of 'negligence, fault, or lack of care'. The AER considers that a pass through regime should not limit the incentives of a service provider to act efficiently, prudently and responsibly[15]. If Envestra was compensated for all costs exceeding an insurance cap due to its 'negligence, fault, or lack of care', it would face a diminished incentive to avoid negligent behaviour.

In the revised access arrangement proposal, Envestra submitted that in the absence of a cost pass through above the insurance cap, Envestra would have to insure for a higher level of public liability cover. [16] This would lead to a rise in insurance premiums and consequently, opex. Similar arguments were raised in the Victorian DNSPs final decision, and were rejected by the AER.[17]

The AER does not accept Envestra's proposed revision, on the basis that it does not promote the long term interests of users or prospective users as required under the national gas objective.[18]

Insurer Insolvency Event

The AER accepts in principle Envestra's proposed additional event, and considers it addresses a circumstance where Envestra may face material costs but is not in a position to mitigate the risk of the event occurring. However, the AER does not consider the definition proposed by Envestra was sufficiently clear. The AER considers that new event is to be included via revision to the 'insurer credit risk event', by adding the following text at the end of the definition:

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13 NGL s. 23 and NGL s. 24.

14 Jemena, *AER draft decisions for Envestra Ltd access arrangement proposals for the South Australian and Queensland gas networks*, April 2011, pp. 3–4.

15 AER, *Final decision, Victorian distribution determination*, June 2010, pp. 794-798.

16 Envestra, *Revised Qld access arrangement information, Attachment 15*-2, March 2011, pp. 6–8.

17 AER, *Final decision, Victorian distribution determination*, October 2010, pp. 792-793.

18 NGL s. 23.

(c) incurs additional costs associated with self funding an insurance claim, which, would have otherwise been covered by the insolvent insurer.

The AER notes that a similar proposal for the inclusion of this event was accepted in the final decision for the Victorian DNSPs.[19]

Network User Failure Event

The AER does not accept Envestra's proposed revision, on the basis that:

- Envestra should manage the risks of network user insolvency within its business. It can accurately assess those risks and adopt appropriate mitigating measures.

- providing full recovery of costs would be inconsistent with the revenue and pricing principles under s.24 of the NGL, which require the AER to provide incentives for the service provider to act efficiently. In this case, the AER considers that including a network user insolvency event would have the effect of reducing Envestra's incentive to efficiently manage commercial risk.

The AER considers that Envestra is the body that is best placed to establish appropriate prudential requirements to guard against the risk of network user insolvency. As such, users and prospective users should not be unduly burdened with the risk imposed by the proposed revision. If Envestra was compensated for any costs arising from user default, it would reduce the incentive for Envestra to establish appropriate prudential requirements in higher risk customers.

In its revised access arrangement proposal, Envestra considered the AER's definition did not provide Envestra sufficient protection against the losses it would suffer as a result of a network user's potential insolvency. [20] Envestra stated that its current credit policy only offered limited protection. The AER considers Envestra is responsible for management of its credit policy to mitigate these risks, and that the proposed revision will distort this appropriate balance of risk. The AER therefore does not accept Envestra's proposed revision, as it does not provide efficient incentives for the service provider, or appropriately balance the risk of network user failure.

Regulatory change event

The AER considers the definition of 'regulatory change event' should be amended so as to eliminate any potential overlap between the 'regulatory change event', 'service standard event' and 'tax change event'. The AER considers that the draft decision definition of the 'regulatory change event' may potentially encompass a change in service standard or a tax event. In order to avoid any overlap in the event definitions, the AER considers that definition should be amended by inserting the following words as a subclause at the beginning of the definition: 'falls within no other category of cost pass through event'.

The AER has also amended the definition of a regulatory change event to directly accommodate the imposition of new regulatory requirements, or the removal of existing regulatory requirements. This revision was proposed by APT Allgas, and the

19 AER, *Final decision, Victorian distribution determination*, June 2010, p. 784.
20 Envestra, *Revised Qld access arrangement information, Attachment 15-2*, March 2011, pp. 8–9.

AER considers it improves the clarity of the event definition, while remaining consistent with the intention of the event.

Other definition issues

The AER has identified a minor error in the draft decision, identified by APT Allgas. The words 'regulatory control period' should be replaced by the words 'access arrangement period'. The AER accepts this amendment to ensure consistency with gas services terminology, and has incorporated the amendment in revision 12.3.

The AER also accepts Envestra's proposal that the word 'substantially' should be removed from the definition of a 'regulatory change event'. APT Allgas also proposed to remove the word from the definitions of the 'regulatory change' event and the 'service standard' event. [21]

The AER considers:

- the word 'substantially' is a qualitative and undefined concept, and would therefore introduce uncertainty and ambiguity for the service providers and the network users; and increase administrative costs for the AER

- the deletion of the word is consistent with the AER's approach to defining specific cost pass through (or trigger) events – that is, having a clear set of events that could appropriately balance the distribution of risks between service providers and network users

- the deletion of the word is therefore consistent with the national gas objectives in the NGR and the revenue and pricing principles in the NGL.

For the reasons above, the AER accepts Envestra's revised access arrangement proposal to delete the word 'substantial' from the definition of the 'service standard event', and considers it should also be deleted the 'regulatory change' event.

12.3.2.2 Procedure for cost pass through event variation

Envestra amended its process for cost pass throughs in its access arrangement as required in the AER's draft decision, but included further revisions.[22]

The AER accepts Envestra's proposed revisions. Where the costs of a cost pass through event take longer than 90 days to calculate and verify, the AER considers Envestra should not be limited from passing through such an event. The revised process proposed by Envestra is largely consistent with the process for cost pass through assessments under the NER. The AER will assess Envestra's proposed costs or estimates against the requirements under the NGR and NGL before approving any such pass through application.

The AER considers Envestra's proposed revision increases the flexibility of the cost pass through mechanism, while ensuring the appropriate balance of risk sharing between Envestra and its users.

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[21] APT Allgas, *Revised access arrangement submission*, March 2011, p. 98; APT Allgas, *Revised access arrangement proposal*, March 2011, p. 17.

[22] Envestra, *Revised Qld access arrangement information, Attachment 15-2*, March 2011, pp. 4–5.

12.3.2.3 Materiality threshold

Envestra amended its access arrangement to include the AER's materiality threshold, but proposed a revision that materiality be determined relative to the annual forecast revenue in the first year that costs from the event are incurred.[23]

The AER does not accept Envestra's proposed revision, and maintains its draft that costs incurred from an eligible cost pass through event should be assessed against one per cent of the smoothed forecast revenue in the years those costs are incurred. The purpose of the materiality threshold is to ensure that eligible event costs leading to a high magnitude financial impact on Envestra can be passed through, while preserving the incentive for Envestra to efficiently mitigate these ongoing costs. By assessing all ongoing costs against one per cent of the revenue in one year, Envestra's proposed materiality threshold significantly lowers the effective materiality of event costs. This in turn diminishes Envestra's incentive to mitigate event costs, and disproportionately burdens users with risk.

12.3.3 Annual tariff variation approval

12.3.3.1 Submission date

The AER does not accept Envestra's proposed deadline for submitting its annual tariff variation proposals. The AER does not accept Envestra's assertion that the AER only had had regard to its own administration costs in making its draft decision.[24] The AER is mindful of not only its administration costs, but also the administration costs to Envestra and the various users or potential users of the pipelines consistent with r.97(3)(b) of the NGR. Retailers and other customers need time to implement and respond to annual price changes. By bringing the approval of prices forward the AER considers that the administration costs of these various users can be reduced. The updating for March CPI is a relatively straight forward matter. If a template like the one used during the earlier access arrangement period were used, the updating of figures should be a straight forward process. The change in CPI affects all tariffs in a symmetrical fashion, so this should not affect the relatively of any rebalancing of the tariffs. Should the publication of the March CPI be delayed, this could be updated during the assessment period. For the reasons outlined in the draft decision, the AER considers that 50 business days notice is necessary to conduct its own assessment and still provide users (such as gas retailers) with reasonable notice of the tariff variations. Consistent with r. 97(3)(b) of the NGR, the administrative costs for users could be quite significant if they do not have sufficient time to implement or adjust to annual tariff variations. Accordingly, the AER rejects Envestra's revised access arrangement proposal on this matter and requires the annual tariff variation to be submitted 50 business days before 1 July each year.

12.3.3.2 Auditing requirements

The AER considers that the quantity data used in the tariff control and rebalancing formulas should be audited. The AER does not agree that it has not given regard to the administration cost of the auditing requirements. The costs of administrating the annual price approval process are a concern that is raised by service providers across jurisdictions and industries. The AER must balance these concerns against the need

[23] Envestra, *Revised Qld access arrangement information, Attachment 15-2,* March 2011, pp. 5–6.
[24] Envestra, *Revised Qld access arrangement information, Attachment 15-2,* March 2011, p.3.

for robust data upon which price will be set. The AER considers that Envestra should conduct an audit of the quantity data used to support its pricing proposals. A moderate (negative) assurance audit is required from Envestra.[25] The level of audit assurance reflects on one hand the costs and time involved in such audits and the need for robust data on the other. However, the AER reserves the right to require a reasonable (positive) audit assurance of the quantity data in the future.

12.3.3.3 Provision of quarterly data

The AER agrees with Envestra that quarterly demand data is not necessary for pricing purposes. Such information may be required if a better understanding were required of seasonal variations in demand. However, this would be a matter best dealt with as part of the annual reporting requirements. The AER is somewhat surprised that Envestra should state that the effort in providing quarterly data should not be underestimated.[26] The AER would have thought that this information would be readily available through Envestra's billing systems.

12.3.3.4 Rounding convention

The AER accepts Envestra's proposed rounding convention as being consistent with r. 97(3) of the NGR.

12.4 Conclusion

The AER did not accept the revised tariff variation mechanism proposed by Envestra as it does not comply with r. 92(2) of the NGR in terms of the value of the X and Y factors.

The AER's conclusions on specified cost pass through events are set out in table 12.1, and its conclusions on other issues regarding the cost pass through variation mechanism are set out in table 12.2. Where the AER has accepted a revision from either business, it has incorporated the revision into its decisions for both Envestra and APT Allgas. The AER considers these revisions result in a cost pass through mechanism that promotes the long term interests of users, prospective users, and Envestra.

[25] ASAE 3000 is the relevant audit standard.
[26] Envestra, *Revised Qld Access Arrangement Information,* Attachment 15-2, March 2011.

Table 12.1: Defined cost pass through events – Revised proposals and AER's conclusions

Cost pass through events	Revision proposed by	Revision proposed	AER's conclusion
Regulatory change event	Envestra	Delete the word 'substantially'	Accepts Envestra's proposed revision
Regulatory change event	APT Allgas	Delete the words 'substantially affects the manner in which APT Allgas provides reference services (as the case requires)'.	Rejects APT Allgas's proposed revision, but accepts the deletion of the word 'substantially'.
Service standard event	Envestra	Delete the word 'substantially'	Accepts Envestra's proposed revision
Tax change event	APT Allgas	Include new definitions relating to 'Tax' and 'Authority' in the glossary	Accepts APT Allgas's revised proposal.
Network user failure event	Envestra	Add the words 'becomes insolvent or' after the words 'whereby an existing network user'.	Rejects Envestra's proposed revision
Insurer Credit Risk Event	APT Allgas	Delete the word 'nominated'	Accepts APT Allgas's new definition
Insurance cap event	Envestra	Delete the words: 'this event excludes all costs incurred beyond an insurance cap that are due to Envestra's negligence, fault, or lack of care'.	Rejects Envestra's proposed revision
Natural disaster event	APT Allgas	Substitute 'regulatory control period' for 'access arrangement period', and substitute 'forecast operating expenditure' for 'approved revenue requirement'	Accepts 'access arrangement period' revision, but rejects 'approved revenue requirement' revision.
Insurer insolvency event (new cost pass through event)	Envestra	Add an 'insurer insolvency event' by inserting : "An 'insurer insolvency event' means the insolvency of an insurer resulting in material losses to Envestra as a result of unsatisfied claims."	Accepts APT Allgas's revised proposal in principle. However, this new event is added by revising the 'insurer credit risk event'. Revision requires adding the following text at the end: "(c) incurs additional costs associated with self funding an insurance claim, which, would have otherwise been covered by the insolvent insurer."
Carbon pricing event (new cost pass through event)	APT Allgas	Proposed this event as a new cost pass through event	Rejects APT Allgas's proposed revision

Table 12.2: Other cost pass through issues – Revised proposals and AER's conclusions

Other matters	Revision proposed by	Revision proposed	AER's conclusion
Materiality threshold	Envestra	Add the word 'first' in front of the last word 'incurred'	Rejects Envestra's proposed revision
Materiality threshold	APT Allgas	Add the word 'annualised' in front of 'impact'	Rejects APT Allgas's proposed revision
Process for cost pass through applications	APT Allgas	Gave the AER discretion to extend the time required for notification of an event.	Accepts APT Allgas's proposal inc principle, but required an alternative revision (as proposed by Envestra).
Process for cost pass through applications	Envestra	Proposed to notify the AER of pass through costs when they are known or can be estimated.	Accepts Envestra's proposed revision.
Application of cost pass through event variations	APT Allgas	Proposed that the AER should have discretion to allow mid-period tariff changes where the AER considers APT Allgas's financial viability is at risk.	Rejects APT Allgas's proposed revision.
Pass through of costs in the subsequent period	APT Allgas	Proposed that qualifying pass through event costs incurred in the last year of the regulatory period should be passed through in the next access arrangement period.	Rejects APT Allgas's proposed revision.

The AER does not accept Envestra's proposed deadline for submitting its annual tariff variation proposals. The AER requires the annual tariff variation to be submitted 50 business days before 1 July each year.

The AER considers that the quantity data used in the tariff control and rebalancing formulas should be audited as discussed above.

12.5 Revisions

The AER proposes the following revisions:

Revision 12.1: amend the revised access arrangement to include the following X factors in the tariff control and rebalancing formulas.

– 5 % in 2012-13;

– 5 % in 2013-14;

– 4 % in 2014-15;

– 3 % in 2015-16.

Revision 12.2: amend the revised access arrangement so that the Y factor in the rebalancing formula equals – 2 per cent.

Revision 12.3: amend section 4.5 of the revised access arrangement as follows:

Subject to the approval of the Regulator under the NGR, Reference Tariffs may be varied after one or more cost pass through event/s occurs, in which each individual event materially increases or materially decreases the cost of providing the reference services. Any such variation will take effect from the next 1 July.

In making its decision on whether to approve the proposed cost pass through event variation, the AER must take into account the following:

- the costs to be passed through are for the delivery of pipeline services
- the costs are incremental to costs already allowed for in reference tariffs
- the total costs to be passed through are building block components of total revenue
- the costs to be passed through meet the relevant National Gas Rules criteria for determining the building block for total revenue in determining reference services
- any other factors the AER considers relevant and consistent with the NGR and NGL.

Cost pass through events are:

- a regulatory change event;
- a service standard event;
- a tax change event;
- a terrorism event;
- a network user failure event;
- an insurer credit risk event;
- an insurance cap event;
- a natural disaster event;

Where

Regulatory change event—means:

An imposition of, a change in, or the removal of a regulatory obligation or requirement that:

(a) falls within no other category of cost pass through event; and

(b) occurs during the course of an access arrangement period; and

(c) affects the manner in which Envestra provides reference services (as the case requires); and

(d) materially increases or materially decreases the costs of providing those services.

Service standard event—means:

A legislative or administrative act or decision that:

(a) has the effect of:

(i) varying, during the course of a access arrangement period, the manner in which Envestra is required to provide a reference service; or

(ii) imposing, removing or varying, during the course of an access arrangement period, minimum service standards applicable to prescribed reference services; or

(iii) altering, during the course of an access arrangement period, the nature or scope of the prescribed reference services, provided by Envestra; and

(b) materially increases or materially decreases the costs to Envestra of providing prescribed reference services.

Tax change event—means:

A tax change event occurs if any of the following occurs during the course of an access arrangement period for Envestra:

(a) a change in a relevant tax, in the application or official interpretation of a relevant tax, in the rate of a relevant tax, or in the way a relevant tax is calculated;

(b) the removal of a relevant tax;

(c) the imposition of a relevant tax; and

In consequence, the costs to Envestra of providing prescribed reference services are materially increased or decreased.

Tax means

Any tax, levy, impost, deduction, charge, rate, rebate, duty, fee or withholding which is levied or imposed by an *Authority*.

Authority means

Any government, government department, instrumentality, *Minister*, agency, statutory authority or other body in which a government has a controlling interest, and includes the *AEMC*, *AEMO*, the *AER* and the *ACCC* and their successors.

Terrorism event—means:

An act (including, but not limited to, the use of force or violence or the threat of force or violence) of any person or group of persons (whether acting alone or on behalf of in connection with any organisation or government), which from its nature or context is done for, or in connection with, political, religious, ideological, ethnic or similar purposes or reasons (including the intention to influence or intimidate any government

and/or put the public, or any section of the public, in fear) and which materially increases the costs to Envestra of providing a reference service.

Network user failure event — means:

A network user failure event means the occurrence of an event whereby an existing network user is unable to continue to supply gas to its customers, and those customers are transferred to another network user, and which materially increases the costs of Envestra providing reference services.

Insurer credit risk event—means:

An event where the insolvency of the insurers of Envestra occurs, as a result of which Envestra:

(a) incurs materially higher or lower costs for insurance premiums than those allowed for in the access arrangement; or

(b) in respect of a claim for a risk that would have been insured by Envestra's insurers, is subject to a materially higher or lower claim limit or a materially higher or lower deductible than would have applied under that policy; or

(c) incurs additional costs associated with self funding an insurance claim, which, would have otherwise been covered by the insolvent insurer.

Insurance cap event—means:

An event that would be covered by an insurance policy but for the amount that materially exceeds the policy limit, and as a result Envestra must bear the amount of that excess loss. For the purposes of this cost pass through event, the relevant policy limit is the greater of the actual limit from time to time and the limit under Envestra's insurance cover at the time of making this access arrangement. This event excludes all costs incurred beyond an insurance cap that are due to Envestra's negligence, fault, or lack of care. This also excludes all liability arising from the Envestra's unlawful conduct, and excludes all liability and damages arising from actions or conduct expected or intended by Envestra.

Natural disaster event—means:

Any major fire, flood, earthquake, or other natural disaster beyond the control of Envestra (but excluding those events for which external insurance or self insurance has been included within Envestra's forecast operating expenditure that occurs during the access arrangement period and materially increases the costs to Envestra of providing reference services.

Materiality threshold is defined as:

For the purpose of any defined cost pass through event, an event is considered to materially increase or decrease costs where that event has an impact of one per cent of the smoothed forecast revenue requirement specified in the access arrangement information, in the years of the access arrangement period that the costs are incurred.

Revision 12.4: amend section 4.6.1 of the revised access arrangement as follows:

4.6.1 Procedure for Cost Pass Through Event Variation in Reference Tariffs

Envestra will notify the AER of cost pass through events within 90 business days of the cost pass through event occurring, whether the cost pass through event would lead to an increase or decrease in Reference Tariffs.

When the costs of the pass through event incurred are known (or able to be estimated to a reasonable extent), then those costs shall be notified to the AER. When making such notification to the AER, Envestra will provide the AER with a statement, signed by an authorised officer of Envestra, verifying that the costs of any pass through events are net of any payments made by an insurer or third party which partially or wholly offsets the financial impact of that event (including self insurance).

The AER must notify Envestra of its decision to approve or reject the proposed variations within 90 Business Days of receiving the notification. This period will be extended for the time taken by the Regulator to obtain information from Envestra, obtain expert advice or consult about the notification.

The AER will endeavour to make its decision on whether Envestra should vary Reference Tariffs due to the occurrence of a cost pass through event within 90 business days of receiving a notification from Envestra.

However, if the AER determines the difficulty of assessing or quantifying the effect of the relevant cost pass through event requires further consideration, the AER may require an extension of a specified duration. The AER will notify Envestra of the extension, and its duration, within 90 business days of receiving a notification from Envestra.

Revision 12.5: amend the revised access arrangement to include a requirement that the annual tariff variation proposal be submitted by Envestra 50 business days before the end of each tariff year.

Revision 12.6: amend the revised access arrangement to include a requirement that the historical quantities used in the annual tariff approval process be subject to an audit each year.

Part C – Other provisions of an access arrangement

13 Non-tariff components

Envestra's access arrangement sets out proposed terms and conditions that are not directly related to the nature or level of tariffs paid by users, but which are important to the relationship between the network service provider and users.

In its draft decision, the AER accepted some of the terms and conditions but required amendments in most of them. In response to the draft decision, Envestra has:

- *accepted most of the AER's amendments*
- *partly accepted some with proposed modifications to the wording of the relevant clauses*
- *not accepted other amendments and requested revisions.*

The AER accepts most of Envestra's proposed modifications to the wording of clauses as they do not affect the substance of the clauses. However, the AER proposes not to approve some of Envestra's revised terms and conditions. The AER considers the amended provisions for these terms and conditions better promote the national gas objective in s. 23 of the NGL. The AER considers that the national gas objective requires the AER to balance the interests of the service provider and users.

In its draft decision, the AER accepted Envestra's proposals in relation to queuing requirements and the revision commencement date but required amendments regarding the capacity trading requirements, extensions and expansions policy, review submission date and the lack of a trigger event for the acceleration of the submission date.

In response to the draft decision, Envestra revised its capacity trading requirements and review submission date but did not accept other amendments to the non-tariff components. The AER accepts Envestra's revised capacity trading requirements, review submission date and removal of the trigger events for the acceleration of the review submission date. However, the AER does not propose to approve part of Envestra's extensions and expansions policy as Envestra has not justified a move away from the draft decision.

13.1 Terms and conditions

13.1.1 Regulatory requirements

Rules 48(1)(d)(i) and 48(1)(d)(ii) of the NGR require a full access arrangement to specify the reference tariff and other terms and conditions on which reference services will be provided.

There are no specific rules in the NGR that guide the AER's assessment of proposed non-tariff terms and conditions.[1] However, in considering Envestra's proposed terms and conditions the AER has had regard to rule 100 of the NGR.

[1] This contrasts with section 3.6 of the Code, which specifically required the regulator to assess whether the terms and conditions were reasonable.

Rule 100 of the NGR requires that an access arrangement must be consistent with the national gas objective and the rules and procedures in force when the terms and conditions of the access arrangement are determined or revised. The national gas objective 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.[2]

The AER has full discretion in assessing Envestra's proposed terms and conditions. Full discretion means that the AER has discretion to withhold its approval to an element of an access arrangement proposal if, in the AER's opinion, a preferable alternative exists that:

- complies with applicable requirements of the NGL and NGR
- is consistent with applicable criteria (if any) prescribed by the NGL and NGR.[3]

13.1.2 Revised access arrangement proposal

In the draft decision, the AER proposed 41 amendments which Envestra was required to incorporate to the proposed terms and conditions before its access arrangement can be approved. Envestra accepted most of the AER's required amendments and revised its access arrangement proposal accordingly. However, Envestra has only partly accepted some of the amendments and proposed modifications to the wording of the relevant clauses, and not accepted other amendments. Table 13.1 summarises Envestra's response to the AER's draft decision on terms and conditions:[4]

Table 13.1: Envestra's response to the AER's draft decision required amendments

Envestra's response	AER's Draft decision amendments
Accepted	13.6, 13.7, 13.11, 3.12, 13.14, 13.15, 13,16, 13.17, 13.22, 13.26, 13.28, 13.29, 13.32, 13.33, 13.36, 13.39, 13.40 (total 17)
Partly accepted and proposed modifications in the wording	13.3, 13.4, 13.8, 13.9, 13.13, 13.18, 13.19, 13.20, 13.24, 13.25, 13.27, 13.34, 13.35, 13.38 (total 14)
Not accepted and requested revisions	13.1, 13.2, 13.5, 13.10, 13.21, 13.23, 13.30, 13.31, 13.37, 13.41 (total 10).

Source: Envestra, *Revised Qld access arrangement information*, Attachment 16-1, March 2011; Envestra, *Revised Qld access arrangement terms and conditions*, March 2011.

The reasons for Envestra partly accepting or not accepting the amendments listed above are set out in appendix A of attachment 16–1 submitted with its revised access arrangement proposal.[5]

2 NGL, s. 23.
3 NGR, r. 40(3).
4 Envestra, *Revised Qld access arrangement information, Attachment 16-1 – Non Tariff Components*, March 2011.
5 Envestra, *Revised Qld access arrangement information, Attachment 16-1 – Non Tariff Components*, March 2011.

13.1.3 Summary of submissions

The AER received a submission from AGL covering aspects of the AER's draft decision and Envestra's revised access arrangement proposal.[6] AGL has mostly accepted the AER's consideration and proposed amendments in the draft decision. However, AGL submitted that it was unable to identify in Envestra's revised access arrangement proposal the amendments required by the AER relating to delivery of gas (clauses 2.4, 2.5 and 16.6), maximum hourly quantity (clause 4.2), maintenance and renewal of metering equipment (clause 9.3), and holding over (clause 26.8).

The AER's consideration of AGL's submission is outlined in detail in appendix D.

13.1.4 AER's consideration

The AER's assessment of Envestra's proposed terms and conditions and issues raised in response to the AER's draft decision is set out in detail in appendix D and summarised in the tables below. Appendix D covers only those amendments which Envestra either did not accept or only partly accepted (for example, by proposing alternate wording of the relevant clauses).

In assessing Envestra's revised terms and conditions and AGL's submission the AER has had regard to the national gas objective. The AER considers that in order to achieve the national gas objective the interests of both consumers and gas pipeline service providers need to be taken into account. In making the final decision, the AER has reviewed Envestra's revised access arrangement proposal, including the revised terms and conditions set out in annexure G, and considered the issues concerning terms and conditions raised in submission.[7]

Table 13.2 summarises the AER's required amendments to terms and conditions which Envestra accepted in part but proposed modifications to the wording of clauses. The AER mostly accepts these modifications as they do not affect the substance of the clauses proposed by the AER.

6 AGL, *Envestra's Qld gas network revised access arrangement proposal, Attachment A*, April 2011 and Origin, *Envestra's SA gas revised access arrangement proposal*, April 2011, pp. 1–6.

7 Envestra, *Revised Qld access arrangement proposal*, March 2011; Envestra, *Revised Qld access arrangement information, Attachment 16-1 – Non Tariff Components*, March 2011*;* Envestra, *Revised Qld access arrangement terms and conditions*, March 2011.

Table 13.2: Summary of the terms and conditions partly accepted by Envestra with proposed modifications and the AER's assessment

Matter	AER draft decision amendments	Envestra's T&C clauses (Annexure G)	Envestra response/ proposed modifications	AER's assessment
Gas specifications	13.3 and 13.4	12.6 and 13.5		
Reduction in MDQ	13.8	7.7 and 7.8		
Request for explanation	13.9	7.5		
Ancillary reference services	13.13	18.2	Partly accepted and proposed modifications to the wording of clauses.	AER accepts Envestra's proposed modifications as they do not affect the substance of the clauses. No further revision required by the AER.
Right to set off unpaid amounts	13.27	25.2		
Overdue interest/ Right to suspend services/ Termination by Envestra	13.18, 13.19 and 13.20	25.1, 25.3 and 26.2(a)		
Network user to assist	13.34 and 13.35	30.1, 30.2 and 30.3		
Delivery of gas	13.1 and 13.2	2.4, 2.5 and 16.6	Not accepted and requested the AER to accept new clauses 2.4, 2.5 and 16.6. If not, Envestra proposed to withdraw these clauses and revert to the previous clause 2.2 in its earlier access arrangement.	AER accepts Envestra's alternative proposal to withdraw new clauses 2.4, 2.5 and 16.6 and revert to the previous clause 2.2 in its earlier access arrangement. Envestra is required to incorporate proposed revision 13. 1.
Maintenance and renewal of metering equipment	13.10	9.3	Not accepted and provided sample invoices.	AER accepts Envestra's proposal not to delete the second part of clause 13.9.
Gas specifications: Notice to Envestra	13.24	12.4	Partly accepted and proposed modifications to the wording of clause.	AER accepts Envestra's proposed modifications. However, Envestra is required to delete the words 'to Envestra' in the heading of clause 12.4 as set out in proposed revision 13.2.
Delivery pressure	13.25	14.2	Partly accepted and excluded the word 'contractor'.	AER does not accept the amended clause and requires Envestra to include the word 'contractor as set out in the proposed revision 13. 3.

Envestra's obligations	13.38	34.5	Partly accepted and proposed modifications to the wording.	AER accepts Envestra's proposed modifications to the wording of clause 34.5 as it does not affect the substance of the clause.

Source: Envestra, *Revised Qld access arrangement proposal*, March 2011; Envestra, *Revised Qld access arrangement information, Attachment 16-1*, March 2011; Envestra, *Revised Qld access arrangement terms and conditions*, March 2011 and AER assessment.

Table 13.3 summarises the terms and conditions which Envestra did not accept along with the AER's assessment and proposed revisions.

Table 13.3: Summary of the terms and conditions not accepted by Envestra and the AER's assessment

Matter	AER draft decision amendments	Envestra's T&C clauses (Annexure G)	Envestra's response/ proposed revisions	AER's assessment/ proposed revisions
Holding over	13.21	26.8	Not accepted and requested the AER to explain the circumstances in which Envestra can negligently continue to deliver gas without an end use consumer.	AER does not accept Envestra's proposal to delete clause 38.2. Envestra is required to amend this clause as set out in the proposed revision 13.4
Automatic amendments	13.23	38.2	Proposed to delete this clause because of the possible impact on existing contracts.	AER accepts Envestra's proposal to delete clause 38.2.
Maximum hourly quantity (MHQ)	13.5	4.2	Not accepted to delete this clause as it is an existing T&C for Envestra's South Australian network and proposed for its Queensland network.	AER agrees with Envestra's proposal not to delete clause 4.2. However, Envestra is required to amend definition of MHQ in its revised access arrangement as set out in the proposed revision 13.5.
Liabilities	13.30 and 13.31	27.6 and 27.7	Submitted that it is superficial to extend the benefit of these clauses to Network Users on the basis that reciprocity is fair and reasonable. These clauses take no account of the legal and commercial effect on existing contracts.	AER accepts Envestra's request to allow additional insurance cost to cover itself against business interruption. AER does not accept Envestra's proposal for revisions of these clauses. Envestra is required to amend these clauses as set out in the proposed revision.13.6 and 13.7.
Claims settlement	13.37	32.6	Proposed to amend clause 32.6 so that it relates only to claims that relate to the Network.	AER accepts Envestra's proposed amendment in clause 32.6.
Amendment to terms and conditions	13.41	-	Not incorporated amendment 13.41 in the revised access arrangement information.	Envestra is required to amend Table 16.1 of its revised access arrangement information as set out in the proposed revision 13.8.

Source: Envestra, *Revised Qld access arrangement proposal*, March 2011; Envestra, *Revised Qld access arrangement information, Attachment 16-1 – Non Tariff Components*, March 2011; Envestra, *Revised Qld access arrangement terms and conditions*, March 2011 and AER assessment.

13.1.5 Conclusion

The AER accepts modifications to the wording of clauses proposed by Envestra as shown in table 13.2 as they do not affect the substance of the clauses proposed by the AER. The AER does not accept some of the revisions proposed by Envestra as shown in table 13.3. The AER considers that consistent with the national gas objective, revisions are required to balance appropriately the interests of Envestra and users.

13.1.6 Revisions

The AER proposes the following revisions:

Revision 13.1: amend annexure G of the revised access arrangement proposal by deleting new clauses 2.4, 2.5 and 16.6 and replacing it with:

Delivery Quantities

'Subject to the terms of the Agreement, Envestra will deliver through each DP whatever Quantity of Gas is taken through that DP (whether that Gas is taken by the Network User, any Customer of the Network User or someone else and whether the taking of that Gas is or is not specifically authorised by the Network User or any Customer of the Network User).'

Revision 13.2: amend annexure G of the revised access arrangement proposal by deleting the words 'to Envestra' in the heading to clause 12.4.

Revision 13.3: amend annexure G of the revised access arrangement proposal by inserting the words 'and the failure is not due to the negligent act or omission on the part of Envestra (or any officer, servant, agent, contractor or other person for whom Envestra is liable)' at the end of clause 14.2.

Revision 13.4: amend clause 26.8 of annexure G of the revised access arrangement proposal by inserting after the words '(as that term is defined in the Retail Market Procedures),' the following words:

'except to the extent that the delivery of Gas is due to the negligent act or omission on the part of Envestra (or any officer, servant, agent, contractor or other person for whom Envestra is liable),'.

Revision 13.5: amend the definition of Maximum Hourly Quantity (MHQ) in the glossary on page 22 of the revised access arrangement proposal as follows:

Maximum Hourly Quantity or 'MHQ', in relation to a DP, means the maximum Quantity of gas (in GJ) which Envestra is obliged to transport and delivery to a particular Delivery Point on behalf of the User in any Hour (excluding Overruns).'

Revision 13.6: amend annexure G of the revised access arrangement proposal by deleting clause 27.6 and replacing it with:

'To the extent permitted by law, neither party will have any liability to the other party, for or in respect of any claim (whether in tort, in contract or otherwise) for any loss of business or business interruption, loss of profit, loss of revenue or loss of opportunity, or for any other purely economic or monetary loss, or for any indirect, special or consequential loss, cost, expense or damage, which the other party may suffer or incur.'

Revision 13.7: amend annexure G of the revised access arrangement proposal by deleting clause 27.7 and replacing it with:

'To the extent permitted by law, the maximum amount that either party will be legally liable to pay to the other party (and to any other person or persons) as damages for compensation in respect of the death or any person or any injury to any person or any damage to any property will be limited to $100 million in aggregate in relation to any one event or occurrence (aggregating all damages and compensation due to the other party and each person in respect of that event or occurrence). Neither party will have any right to recover damages or compensation from the other party in relation to any claim to the extent that the other party's liability will then exceed the limit set out in this clause.'

Revision 13.8: amend table 16.1 of the access arrangement information by deleting the numbers '4', '9.6', and '17' and replacing them with the numbers '2.5', '9.7' and '18' respectively in the column headed 'Old Clause Number', and by deleting the last two rows of table 16.1.

13.2 Capacity trading requirements

13.2.1 Regulatory requirements

Under r. 48(1)(f) of the NGR, capacity trading requirements are to be included in a full access arrangement. Rule 105(1) of the NGR requires that capacity trading requirements must provide for capacity transfers in accordance with the rules or procedures of the relevant gas market, if the service provider is registered as a participant in a particular gas market. If the service provider is not registered, or the rules or procedures do not address capacity trading, then capacity trading requirements must comply with r. 105 of the NGR.

Rules 105(2) and 105(3) of the NGR concern the transfer of capacity trading requirements with and without the service provider's consent. Capacity trading requirements may specify conditions under which consent will or will not be given, and the conditions to be complied with if consent is given. A service provider is precluded from withholding its consent unless it has reasonable grounds, based on technical or commercial considerations, for doing so.[8]

The terms and conditions for changing receipt and delivery points are to be included in a full access arrangement.[9] Rule 106 of the NGR requires that an access arrangement must provide for the change of a receipt or delivery point with the service provider's consent. The service provider is precluded from withholding its consent unless it has reasonable grounds, based on technical or commercial

8 NGR, r. 105(4).
9 NGR, r. 48(h).

considerations, for doing so. The access arrangement may specify conditions under which consent will or will not be given and conditions to be complied with if consent is given.[10]

13.2.2 Revised access arrangement proposal

Amendment 13.41 of the draft decision required Envestra to amend capacity trading section 7 of the access arrangement proposal. The AER considered that amended requirements could better promote the national gas objective in s. 23 of the NGL and better adhere to the pipeline coverage criteria in s. 15 of the NGL.

In the revised access arrangement proposal, Envestra submitted that it had proposed not to continue to include a capacity trading clause because it is not possible to trade capacity on a distribution network (unlike a transmission pipeline), as a network user does not have rights to capacity on a distribution network. In its draft decision, the AER concluded that Envestra should have a clause regarding capacity trading in order to comply with r. 105 of the NGR. While Envestra considers the inclusion of such a clause can only serve to confuse or mislead market participants, it advised it will include the amendment as set out in the draft decision, as it has no impact in practice.[11]

13.2.3 AER's consideration

As set out in the draft decision, the AER considers that Envestra is not disadvantaged by having a clear capacity trading policy if it remains unused, and that inclusion of such a policy better satisfies the requirements of the NGR.

Envestra has incorporated amendment 13.41 in section 7 of the revised access arrangement proposal.[12] However, Envestra has used the word 'Transfers' instead of 'Transactions' in the heading 7.1 and 'transferee' instead of 'transferor' as required in section 7.2. The AER requires an amendment to correct section 7 of Envestra's revised access arrangement proposal as set out in revision 13.11.

13.2.4 Revisions

The AER proposes the following revisions.

Revision 13.9: amend section 7 of the revised access arrangement proposal as follows:

amend heading of section 7.1 by deleting the word 'Transfers' before the words 'Subject to Retail Market Procedures' and replacing it with 'Transactions'.

delete the word 'transferee' in the second paragraph of clause 7.2 after the word 'the' and before the words 'must notify Envestra' and replace it with the word 'transferor'.

10 NGR, r. 106.
11 Envestra, *Revised Qld access arrangement information, Attachment 16-1 – Non Tariff Components,* March 2011, p. 1.
12 Envestra, *Revised Qld access arrangement proposal*, March 2011, pp. 18–19.

13.3 Extensions and expansions policy

13.3.1 Regulatory requirements

Under r. 48 of the NGR, extension and expansion requirements are to be included in a full access arrangement.[13] Rule 104(1) of the NGR requires that extension and expansion requirements may state whether the applicable access arrangement will apply to incremental services provided as a result of a particular extension or expansion or outline how this may be dealt with at a later time. If the requirements provide that an access arrangement applies to incremental services, r. 104(2) of the NGR states that the requirements must deal with the effect of the extension or expansion on tariffs.

13.3.2 Revised access arrangement proposal

The AER's draft decision did not accept Envestra's extensions and expansions policy and required the following amendments:

- if Envestra proposes a high pressure pipeline extension of the covered pipeline, it must apply to the AER in writing to decide whether the proposed extension will be taken to form part of the covered pipeline and will be covered by this access arrangement[14]

- any extensions to and expansions of the capacity of the Network which are not high pressure pipeline extensions …will be treated as part of the Network and covered by this access arrangement. No later than 20 Business Days following the expiration of its financial year, the Service Provider must notify the AER of all extensions of low or medium pipelines and expansions of the capacity of the network[15]

- if an extension or expansion is to be treated as a covered network under the access arrangement, Envestra will offer reference services for that extension or expansion at reference tariffs[16]

Envestra has partly accepted the above amendments and replaced clause 8.2 of the revised access arrangement proposal with section 8.3 of amendment 13.42. Envestra has also amended its extension policy to include references to expansions.[17] However, Envestra did not accept the other amendments and submitted that:

- Envestra's high pressure mains do not share any similar characteristics with transmission pipelines. The operating characteristics of transmission pipelines are also significantly different to distribution network mains

- the AER is incorrect in assuming that low and medium pressure pipeline extensions are more likely to support the existing network. On the contrary, high pressure pipeline extensions are more likely to support the existing network

13 NGR, r. 48(1)(g).
14 AER, *Draft decision*, February 2011, amendment 13.43 (8.1), pp.227–229.
15 AER, *Draft decision*, February 2011, amendment 13.43 (8.2), pp.227–229.
16 AER, *Draft decision*, February 2011, amendment 13.43 (8.3), pp.227–229.
17 Envestra, *Revised Qld access arrangement proposal*, March 2011, pp. 19–20.

- the AER proposed amendments, if adopted, would result in onerous and costly annual reporting requirements for every metre of pipe added to the network, for no benefit to network users or the AER. Envestra argued that such a regulatory imposition would be inconsistent with the aim of maintaining efficient operating costs and minimising the regulatory burden.

13.3.3 AER's consideration

The AER accepts Envestra's revised access arrangement proposal partly incorporating the draft decision amendment 13.43 (section 8.3) relating to the treatment of covered pipelines. However, Envestra is required to correct the heading of clause 8.2 as set out in revision 13.11.

The AER's consideration of issues raised by Envestra in not accepting the AER's required amendments relating to high pressure extensions, other expansions and extensions, and reporting requirements is discussed below:

13.3.3.1 High pressure extensions

The AER disagrees with Envestra that its high pressure mains do not share any similar characteristics with transmission pipelines because:

- high pressure pipeline extensions are more likely to support the existing network rather than low and medium pressure pipeline extensions. As outlined in the draft decision, the AER considers that if low or medium pressure pipeline extensions are not covered under the access arrangement, the service provider has scope to exercise monopoly power by charging above reference prices, with cross-subsidisation from the existing network[18]

- consistent with its previous decisions, the AER considers that high pressure extensions have characteristics similar to transmission pipelines and, from a pipeline coverage perspective, should not receive default coverage under the access arrangement[19]

- the pipeline can be extended for a variety of reasons such as servicing a large industrial user requiring the network to be extended to its premises or supporting the distribution network generally. Therefore, the reasons for the extension and the degree of its integration into the existing network will assist in determining whether the extension should be covered

- the AER considers it is not appropriate for high pressure pipeline extensions to receive coverage under the access arrangement by default. The AER will be best placed to consider such matters with any degree of certainty at the time it is notified of a proposed high pressure pipeline extension.

[18] AER, *Draft decision*, February 2011, pp. 225–229.

[19] For example: AER, *APT Allgas draft decision*, February 2011, pp.164–168; AER, *Jemena Gas Network draft decision*, February 2010, pp. 348–350; AER, *ActewAGL draft decision*, November 2009, pp. 185–186; AER, *Country Energy draft decision*, November 2009, pp. 140–141.

13.3.3.2 Other expansions and extensions

The AER considers that low and medium pressure pipeline extensions to distribution networks are often embedded in and occur throughout the network, and should be covered by default because:

- coverage by default will allow such extensions to be built and covered by the access arrangement
- this policy is likely to contribute to the promotion of the 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 safety, reliability and security of supply of natural gas

13.3.3.3 Reporting requirements

The AER has considered Envestra's submission that reporting requirements proposed by the AER are not appropriate and reasonable. The AER has reconsidered its position and is satisfied the draft decision amendment relating to reporting requirements is not necessary because:

- Envestra is required to give the Australian Energy Market Commission (AEMC) a revised description of the pipeline when this is affected by an extension or capacity expansion.[20] The AER can seek to obtain this information from the AEMC. A Memorandum of Understanding between the two parties addressees information sharing.[21] This avoids any additional regulatory burden on Envestra
- to the extent necessary, the AER may also seek to exercise its information gathering powers under the NGL to specifically request Envestra to keep, maintain and provide necessary information.[22]

13.3.4 Conclusion

The AER accepts Envestra's revised access arrangement proposal incorporating the draft decision amendment 13.43 (section 8.3) relating to treatment of covered pipelines. The AER also accepts Envestra's submission on the reporting requirement and does not seek to impose the draft decision amendment related to the reporting requirements.

However, the AER does not consider the material provided in the revised access arrangement proposal justifies a move away from its draft decision on the high pressure extension and other extensions and expansion policy.

13.3.5 Revisions

The AER proposes the following revisions:

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20 NGR, r. 134.

21 AER, AEMC and ACCC, Memorandum of Understanding between Australian Energy Market Commission and Australian Energy Regulator and Australian Competition and Consumer Commission, 2 July 2009, viewed 7 April 2011, <http://intranet.accc.gov.au/content/index.phtml/itemId/680478>.

22 NEL, s. 48(1).

Revision 13.10: amend section 8 of the revised access arrangement proposal as follows:

8. Network extensions and expansions

8.1 High pressure extensions

If Envestra proposes a high pressure pipeline extension of the covered pipeline, it must apply to the AER in writing to decide whether the proposed extension will be taken to form part of the covered pipeline and will be covered by this access arrangement.

For the purposes of this section 8, a high pressure pipeline extension means a pipeline that exceeds one kilometre in length and is proposed to be built to a postcode area previously not serviced by reticulated gas.

A notification given by Envestra under this clause 8.1 must:

(a) be in writing;

(b) state whether Envestra intends for the proposed high pressure pipeline extension to be covered by this Access Arrangement;

(c) describe the proposed high pressure pipeline extension and describe why the proposed extension is being undertaken; and

(d) be given to the AER before the proposed high pressure pipeline extension comes into service.

Envestra is not required to notify the AER under this clause 8.1 to the extent that the cost of the proposed high pressure pipeline extension has already been included and approved by the AER in the calculation of Reference Tariffs.

After considering Envestra's application, and undertaking such consultation as the AER considers appropriate, the AER will inform Envestra of its decision on Envestra's proposed coverage approach for the high pressure pipeline extension.

The AER's decision referred to above may be made on such reasonable conditions as determined by the AER and will have the effect stated in the decision.

8.3 Other extensions and expansions

Any extensions to and expansions of the capacity of the Network which are not high pressure pipeline extensions within the meaning of clause 8.1 will be treated as part of the Network and covered by this Access Arrangement.

All extensions of low or medium pipelines and expansions of the capacity of the Network carried out by Envestra will be treated as covered under this Access Arrangement.

Revision 13.11: amend heading of clause 8.2 by deleting "Effect of Extension or Expansion on Reference Tariffs" and replacing it with "Treatment of covered pipelines".

Revision 13.12: make any and all consequential amendments necessary in the revised access arrangement proposal and revised access arrangement information to take account of and reflect revisions 13.1 to 13.11.

13.4 Review dates

13.4.1 Regulatory requirements

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

In general, a review submission date will fall four years after the current access arrangement took effect or the last revision commencement date, and a new revision commencement date will fall one year later.[23] The AER is required to accept a service provider's proposed review submission and commencement dates if these are made in accordance with the general rule set out in r. 50 of the NGR.[24] It may also approve dates that do not conform to the general rule if it is satisfied that the dates are consistent with the national gas objective and the revenue and pricing principles.[25]

The review submission date may occur in advance of the date fixed in the access arrangement if a specified trigger event occurs.[26] Rule 51(2) of the NGR provides examples of possible trigger events. The AER may insist on the inclusion of trigger events in an access arrangement and may specify the nature of the trigger events.[27]

13.4.2 Revised access arrangement proposal

The AER's draft decision did not accept Envestra's review submission date and lack of a trigger event for the acceleration of the submission date and required the following amendments:[28]

- Envestra will submit revisions to this access arrangement to the Regulator on or before 1 July 2015
- the revisions submission date stated in clause 9.1 of the access arrangement proposal will advance on the occurrence of a trigger event described below. For the purposes of this clause, a 'trigger event' occurs if:
    - there is an amendment to the NGL or the NGR, or the National Energy Retail Law (NERL) or National Energy Retail Rules (NERR) commence operation in Queensland
    - the STTM does not operate as anticipated and the access arrangement does not effectively accommodate the STTM
    - the AER provides Envestra with a notice stating that the circumstances described in (a) or (b) are significant.[29]

23 NGR, r. 50(1).
24 NGR, r. 50(2).
25 NGR, r. 50(4).
26 NGR, r. 51(1).
27 NGR, r. 51(3).
28 AER, *Draft decision*, February 2011, amendment 13.44, p.231.

Envestra accepted the first part of this amendment and revised its review submission date to 1 July 2015. Envestra did not accept amendment 13.43(2) and did not include trigger events for acceleration of the review submission date on the basis that:

- it does not accept that the implementation of the National Energy Customer Framework (NECF) requires an early review of the access arrangement. Each full review of an access arrangement costs Envestra up to $2.5 million. Given that the NECF will impact only a very small part of what constitutes an access arrangement, Envestra does not believe that a full review of its access arrangement is warranted, particularly as such a review is likely to be within 18 months of the current review

- it believes that any changes arising from the NECF, including changes to terms and conditions can be adequately dealt with through a 'regulatory change event' mechanism

- Envestra does not anticipate any issues in relation to the implementation of the STTM in Brisbane that will require a cost pass through arrangement, let alone a full access arrangement review. The STTM has been implemented in South Australia with little material impact on Envestra's operations, and with no impact on the existing South Australian access arrangement. If the AER were to classify every potential regulatory change or change to make rules as an event requiring a full access arrangement review, this would undermine the access arrangement regulatory process and lead to gross regulatory inefficiency. It has not accepted this aspect of the draft decision, and believes that the AER should rely on its prescribed pass through arrangements

- Envestra believes that the impact of NECF and STTM can be well managed through the regulatory change mechanism as proposed by the AER in its draft decision.[30]

13.4.3 Summary of submissions

Jemena has submitted that it found the AER draft decision on the NECF trigger event for Envestra to be confusing and contradictory. Jemena has proposed that the AER in its final decision should:

- state that the appropriate cost pass through mechanisms in the Envestra access arrangement will be the sole avenues for recouping Envestra's legitimate NECF expenditures

- confirms that the AER will not bring forward a full review of the Envestra access arrangement in response to an amendment to the NGL or NGR, or commencement of the NERL or NERR.[31]

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29 AER, *Envestra draft decision*, February 2011, amendment 13.44, p.231.

30 Envestra, *Revised Qld access arrangement information, Attachment 16-1 – Non Tariff Components*, March 2011, pp. 3–4.

31 Jemena, *Response to AER draft decisions for Envestra's access arrangement proposal for SA and Qld networks, Attachment 1*, 21 April 2011 pp. 4–5.

13.4.4 AER's consideration

The AER accepts Envestra's revised review submission date of 1 July 2015 as incorporated in clause 9.1 of the revised access arrangement proposal.[32]

The AER's consideration of issues raised in Envestra's revised proposal for non-inclusion of trigger event is discussed below:

- the AER considers it important to ensure that the terms and conditions are consistent with the NERL and the NERR. The Jemena submission raises the issue of recovering legitimate NECF expenditures, which is only one part of the equation. The inclusion of the trigger event in the AER's draft decision was to enable other necessary changes to the access arrangement.

- the AER does not agree with Envestra's submission that the AER should rely on its prescribed pass through arrangements, for example, the 'regulatory change event'. The cost pass through mechanism can only take account of costs incurred by the service provider as a result of the coming into force of the NERL and NERR. It cannot take account of other factors that do not relate to the costs incurred by Envestra such as the consideration of revised terms and conditions

- the AER accepts that accelerating the access arrangement review submission in these circumstances can be considered a heavy handed response to ensuring that any costs imposed by the NECF and revised terms and conditions can be considered by the AER. Rule 65(1) of the NGR provides that a service provider may submit for the AER's approval a proposal for variation of the applicable access arrangement. This is considered a more appropriate avenue to implement any revised terms and conditions in the access arrangement upon the commencement of the NERR

- the AER accepts Envestra's revised access arrangement proposal to remove the trigger events as required in amendment 13.44(2) of the draft decision. However, given the need for Envestra to comply with the NERR, the AER expects that Envestra will submit a variation to the access arrangement under r. 65(1) to ensure that the terms and conditions are consistent with the NERR.

13.4.5 Conclusion

The AER accepts Envestra's revised review submission date of 1 July 2015 as incorporated in clause 9.1 of the revised access arrangement proposal. The AER also accepts Envestra's proposal to remove the trigger events as required in amendment 13.44(2) of the draft decision.

[32] Envestra, *Revised Qld access arrangement proposal*, 23 March 2011, p. 21.

A. Detailed WACC issues

This appendix outlines the AER's consideration of detailed issues in relation to Envestra's proposed rate of return, under the following sections:

- overall rate of return
- cost of equity models
- equity beta
- market risk premium (MRP)
- debt risk premium (DRP).

This appendix should be read in conjunction with chapter 5.

A.1 Overall rate of return

This section addresses in detail the different techniques available to the AER to assess the overall rate of return.

A.1.1 Broker reports

Equity analysts release broker reports on the six listed companies operating regulated energy networks in Australia. These reports include a wide variety of information and analysis on the current position of these companies, as well as forecasts or predictions of future performance.

Envestra's original proposal provided analysis performed by SFG on the cost of equity implied by broker reports to test the overall reasonableness of the AER's return on equity.[1] The AER's draft decision rejected the conclusion Envestra formed on the basis of this analysis for a number of reasons.[2] In its revised proposal, Envestra commissioned SFG to provide a response for each of the reasons cited by the AER.[3]

The AER's draft decision and Envestra's revised proposal referred to two types of information available from these broker reports as potentially relevant to the evaluation of the cost of equity:[4]

- broker weighted average cost of capital (WACC) used to discount future cash flows

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1 SFG, *The required return on equity commensurate with current conditions in the market for funds: Report prepared for Envestra*, 27 September 2010, pp. 7–15 (SFG, *Required return on equity*, September 2010).

2 AER, *Draft decision, Envestra access arrangement proposal for the Qld gas network, 1 July 2011–30 June 2016*, 17 February 2011, pp. 57, 237–243 (AER, *Draft decision*, February 2011).

3 SFG, *The required return on equity commensurate with prevailing conditions in the market for funds: Response to draft decision*, 23 March 2011 (SFG, *Required return on equity response*, March 2011).

4 AER, *Draft decision*, February 2011, p. 57, and Envestra, *Revised Qld access arrangement information*, March 2011, attachment 9-10 (*Other rate of return issues*), p. 2.

- broker price and dividend predictions.

In general, the broker reports do not state the full assumptions underlying their analysis, or provide thorough explanations of how they arrive at their forecasts and predictions.[5] The AER therefore considers that caution should be exercised in interpreting the broker reports, since these assumptions may be incompatible with the AER's framework or the underlying calculations may be incorrect. In practice, reports from different brokers for the same company generally contain conflicting forecasts, reflecting disparate views on the correct evaluation technique.

Further, this analysis is only valid to the extent that these six companies are a reliable proxy for the benchmark firm.[6] In particular, the companies undertake both regulated and unregulated activities which are assessed by the brokers in aggregate—but only the regulated activities are directly relevant to the benchmark firm. The AER therefore considers that, in general, this means the overall rate of return implied by these broker reports will likely overstate the rate of return for the benchmark firm.[7]

Broker WACCs

The broker reports often evaluate the present value of the company by estimating all future incoming and outgoing cash flows for the company, and then discounting each cash flow. The discount rate is the broker's estimate of the WACC for the company.

The AER considers that the WACC estimates from the recent broker reports submitted by Envestra (primarily published in February 2011) indicate that the rate of return set by the AER is commensurate with prevailing conditions in the market for funds. The WACC determined by the AER is within the broad range of discount rates applied in the equity broker reports (once converted to a consistent reporting basis), as evident in table A.1. For comparative purposes the AER has also included the headline WACC for broker reports where it could not reproduce a WACC consistent with the formulation adopted by the AER due to insufficient information.

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5 This is not intended as a criticism, since the proprietary methodologies for evaluating shares are confidential as a source of competitive advantage in the course of ordinary commercial enterprise. Further, the primary end users of these documents (investors seeking insight into future share prices) do not require disclosure of this detail.

6 AER, *Final decision, Electricity transmission and distribution network service providers, Review of the weighted average cost of capital (WACC) parameters*, 1 May 2009, pp. 77–82, 97–110 (AER, *Final decision, WACC review*, May 2009).

7 The underlying reason is that the regulated activities of the firms—operation of monopoly transmission and distribution networks—are less risky than the unregulated activities they undertake in competitive markets. Greater risk requires greater return (and vice versa).

Table A.1 Comparison of WACC used by brokers and the AER (per cent)

Broker	Companies assessed	Vanilla WACC	Headline WACC
Austock	SKI	–	8.62
Citigroup	DUE, SKI	9.20–10.90	–
Credit Suisse	APA	9.35	7.81
Deutsche Bank	APA, DUE, SPN	9.22	7.80
Goldman Sachs	APA, ENV, SKI	10.04–10.66	8.20–8.50
JP Morgan	APA, DUE, HDF, SKI	–	6.50–8.50
Macquarie	APA, ENV, SKI	–	6.70–7.90
Merrill Lynch	APA, ENV, HDF	–	7.40–8.80
Morgan Stanley	SPN	8.16	7.70
UBS	SKI	8.04–8.44	6.50–6.80
Wilson	HDF	10.02	8.25
Aggregate range		**8.04–10.90**	**6.50–8.80**
AER	**(Benchmark firm)**	**9.77**	**–**

Source: Equity broker reports submitted by Envestra, AER analysis.
Note: Companies evaluated are APA Group (APA), DUET Group (DUE), Envestra Limited (ENV), Hastings Diversified Utilities Fund (HDF), Spark Infrastructure Group (SKI), and SP AusNet (SPN).

Broker price and dividend forecasts

The broker reports usually include forecasts of dividends for the next few years. The broker reports often include predictions for the future share price over a given horizon (usually twelve months).

Envestra's original proposal included an estimate of the cost of equity by SFG labelled as 'market based assessment'.[8] SFG generated this estimate by analysing equity broker reports and combining the expected dividend yields with the expected price appreciation (capital gain).[9]

The AER's draft decision rejected SFG's 'market based assessment' using broker reports, noting that the assessment confused dividends with distributions that comprise dividends, interest and repayment of capital.[10] The AER considered that it was unreasonable to expect these distributions to occur in conjunction with nominal

8 Envestra, *Qld access arrangement information*, October 2010, p. 135
9 SFG, *Required return on equity*, September 2010, p. 7–15.
10 AER, *Draft decision*, February 2011, pp. 57, 237–243.

price appreciation just above inflation. The AER set out the reasons why it is conceptually invalid to use these price forecasts as a proxy for capital gains.[11]

Envestra's revised proposal included an updated 'market based assessment' from SFG, which now appears to be given substantial weight by Envestra in the determination of its final cost of equity.[12] In section A.2 of this appendix, the AER concludes that the 'market based assessment' is not a well accepted financial model and therefore cannot be used as the primary determinant of the rate of return on capital.[13] This section addresses the reliability of this method and its suitability for use as a reasonableness check on the overall cost of equity.

Price forecasts

In the draft decision, the AER noted concerns with SFG's analysis which relied on the price forecasts from the broker reports in forming its 'market based assessment' of the cost of equity.[14] In response SFG disagreed with the AER on this point, stating that:

> However, the previous SFG report clearly does *not* rely on broker price forecasts, but rather substitutes very conservative estimates of future price appreciation.[15]

> The previous SFG Report does *not* rely on broker price appreciation forecasts, so there can be no "shortcoming" in that regard, notwithstanding any suggestion to the contrary.[16]

The SFG reports used a 'very conservative' estimate of price appreciation of 2.5 to 3.5 per cent in nominal terms (0 to 1 per cent in real terms). This estimate is justified explicitly by reference to the broker price forecasts:

> For these reasons, we place little weight on the forecasts of price appreciation other than to note that they are uniformly positive on average.[17]

> …for various reasons one should not rely on the 12-month price forecasts, except to note that no analysts were expecting a price decline in any of the set of comparable firms.[18]

> In this regard, our previous report shows that the evidence form a range of research reports from equity analysts is that:
> …
> c. There is no suggestion of any expected future decline in the share price.[19]

That is, although SFG did not rely on the magnitude of the broker price forecasts, it pointed to the direction of the broker price forecasts to assert that there would be no

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11 AER, *Draft decision*, February 2011, pp. 237–238.
12 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 9-10 (*Other rate of return issues*), p. 2 and attachment 9–13 (*Proposed rate of return*), pp. 1–2; SFG, *Required return on equity response*, March 2011, pp. 5–13.
13 See also chapter 5.4.2 of this decision.
14 AER, *Draft decision*, February 2011, p. 237–242.
15 SFG, *Required return on equity response*, March 2011, p. 6 (paragraph 19).
16 SFG, *Required return on equity response*, March 2011, p. 6 (paragraph 22).
17 SFG, *Required return on equity*, September 2010, p. 13 (paragraph 13).
18 SFG, *Required return on equity response*, March 2011, p. 5 (paragraph 16).
19 SFG, *Required return on equity response*, March 2011, p. 10 (paragraph 35).

drop in share prices. Ruling out the possibility of a capital loss is crucial to the SFG argument that the observed dividend yield represents the minimum return on equity.

The AER has considered the responses and maintains its position from the draft decision that the SFG 'market based assessments' inappropriately rely on broker price forecasts in this way. This is because, as discussed in the draft decision, and acknowledged by SFG in their reports:

- these price forecasts are highly variable with disparate broker estimates for the same firm, suggesting that they are inherently unreliable[20]

- these price forecasts cannot be equated with annual capital appreciation over the long-term, because they only consider the short-term (usually the next twelve months) and present expected highs that will be reached at some point during this time[21]

- these price forecasts all occur in the context of buy or hold recommendations and may reflect a market where the prices are misaligned with fundamentals.[22]

Further, the AER considers that the October 2010 SFG statement that the price forecasts 'are uniformly positive on average' appears slightly misleading, since the average forecast for Spark Infrastructure was (one of the six companies) a real price reduction—that is, nominal price appreciation below the inflation rate.[23] More importantly, using the most recent broker reports (primarily from February 2011), 40 per cent of all individual company forecasts are for real price declines,[24] and the average across all broker forecasts for two of the six companies—APA Group and Envestra—are for real price declines.[25] The AER therefore considers that the March 2011 SFG assertion that 'there is no suggestion of any expected future decline in the share price' is incorrect.[26]

The AER acknowledges that there is an additional explanation for the adoption of this 2.5 to 3.5 per cent range, based on 'standard long-term equity valuation models' where share price growth is equated to dividend growth.[27] As discussed in the draft

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20 SFG, *Required return on equity*, September 2010, p. 13 (paragraph 13).

21 SFG, *Required return on equity*, September 2010, pp. 13–14, and AER, *Draft decision*, February 2011, p. 238.

22 AER, *Draft decision*, February 2011, p. 238.

23 SFG, *Required return on equity*, September 2010, p. 13 (table 3 and paragraph 42).

24 There are 35 broker reports that present price estimates (and have not been superseded by a more recent report from the same broker for the same company) and 14 of these have price forecasts that increase by less than 2.5 per cent (SFG's assumed inflation rate).

25 The average forecast for APA Group is 1.83 per cent increase (based on reports from Citigroup, Credit Suisse, Deutsche, Goldman Sachs, JP Morgan, Macquarie, Merrill Lynch, UBS and WilsonHTM). The average forecast for Envestra is 2.03 per cent decline (based on reports from Goldman Sachs, JP Morgan, Macquarie, Merrill Lynch and UBS).

26 To prevent misunderstanding, this is not to imply that the AER considers the October 2010 broker price forecasts were unreliable but the February 2011 forecasts have become reliable. As in the draft decision, the AER considers that all the broker price forecasts are unreliable, for the reasons explained above. However, if the broker forecasts were reliable (as SFG claimed), they still would not support the SFG conclusion that share price declines are implausible.

27 SFG, *Required return on equity*, September 2010, p. 14 (paragraph 43), which is quoted by SFG, *Required return on equity response*, March 2011, p. 5 (paragraph 17).

decision this 'standard model' is inappropriate for the circumstances of the six firms in this analysis, where the large distributions comprise return of capital as well as dividends.[28] There is further analysis on this point in the following section.

Dividend forecasts

SFG has focussed on the relevance of dividend yields to the cost of equity. It stated that no analyst has forecast any decline in dividends for any of the six listed regulated energy networks.[29] In addition, the annual reports for these six firms state the objective of dividend increases and the means by which that will be delivered.

The AER maintains its position from the draft decision that changes in capital structure must be taken into account when using 'dividend yields' as a proxy for the return on equity. If the dividends (or more correctly, distributions) are stable but price depreciation occurs, then the total return to equity holders (including their capital loss) will be below the observed dividend yield. Noting that the broker reports predict stable or increasing 'dividends' over the short-term (two to three years) does not engage with the implications of these distribution levels for the ongoing capital structure of the firm.

In this context, Professor Davis noted that the current dividend levels are unsustainable in the long-term and could not be maintained in conjunction with a constant or growing share price.[30] For five of the six businesses, current earnings do not cover distributions and are therefore being paid from equity (retained earnings).[31] Beyond the short term, either capital value of the shares will reduce to reflect the reduction in equity value or the distributions will fall to sustainable levels. It is therefore inappropriate to equate the observed dividend yield with the return to equity holders (as per the SFG 'market based assessment').

The SFG report also asserts that it is irrelevant whether a distribution is composed of return *on* capital or return *of* capital, because the free cash flow generated by the firm remains the same.[32] Professor Davis reiterates that the return of capital is associated with the depreciation of the underlying assets.[33] The analysis provided by SFG is incorrect because it assumes that the assets of the firm are unchanged despite the return of capital, and therefore overlooks the consequential reduction in share price. Further, for the regulated firm there will be a proportionate reduction in the cash flow generated by the smaller asset base.

The AER considers that the price and dividend forecasts contained in equity broker reports (and hence the SFG 'market based assessment') can not be relied upon to test the reasonableness of the cost of equity.

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28 AER, *Draft decision*, February 2011, pp. 238–240.

29 Envestra Limited, *Revised Qld access arrangement information*, March 2011, *attachment 9-10: (Other rate of return issues)*, p. 2.

30 Davis, *Cost of equity issues: A further report for the AER*, 13 May 2011, pp. 3, 12–14 (Davis, C*ost of equity further report*, May 2011).

31 Further, for one of the five businesses (HDF) earnings were negative so the entire distribution comes from equity. Davis, C*ost of equity further report*, May 2011, p. 14.

32 SFG, *Required return on equity response*, March 2011, pp. 7–8 (paragraph 28).

33 Davis, C*ost of equity further report*, May 2011, pp. 13–14.

A.1.2 Recent sale of regulated assets

The AER considers that recent sales of regulated assets can provide useful insight into whether the AER's WACC adequately compensates regulated service providers. The following issues, identified by the AER's consultant Professor Davis,[34] were raised in the draft decision:[35]

- In principle, if the market value exceeds book value, this suggests that the regulatory rate of return is above that required by investors, and the converse when book value exceeds market value.

- Various factors may cause market and book values to differ at the date of regulatory determinations.

The AER's draft decision presented research by Grant Samuel and Associates Limited that showed regulated firms have been recently purchased at implied RAB multiples of at least 1.2.[36] In addition, the AER included a reference to the purchase of Country Energy's NSW gas network by Envestra at a premium of approximately 26 per cent to the 2010 RAB. The AER calculated this premium using information presented in Envestra's acquisition announcement (a 70:30 split of the $107 million acquisition price between regulated and non-regulated assets) and also information from the regulatory decision on Country Energy's gas network (Wagga Wagga).[37] The premium paid by Envestra relative to Country Energy's RAB and the other implied RAB multiples suggests that the AER's WACC does not under compensate the service provider.

In its revised proposal, Envestra stated:

- The AER used information contained in Envestra's ASX announcement dated 26 October 2010 to conclude incorrectly that Envestra purchased the Wagga Wagga gas network at a 25 per cent premium to the 2010 RAB, and 19 per cent premium to the 2011 RAB[38]. [Text removed – c-i-c]

- No adjustments were made to the regulated asset sales data between 1999 and 2006 to account for non-regulated revenues and/or assets, which could be driving at least a portion of the perceived RAB premium.

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34 Davis, *Cost of equity issues: A report for the AER*, 16 January 2011, p. 7 (Davis, *Cost of equity*, January 2011).

35 AER, *Draft decision*, February 2011, pp. 234–237.

36 Grant Samuel and Associates Pty Limited, *Financial Services Guide and Independent Expert Report in relation to the Recapitalisation and Restructure of Babcock & Brown Infrastructure*, 9 October 2009, p. 78 and Grant Samuel and Associates Pty Limited, *Independent Expert Report in relation to the Acquisition of the Alinta Assets*, 5 November 2007, p. 65.

37 AER, *Final decision, Wagga Wagga natural gas distribution network 1 July 2010–30 June 2015*, March 2010, p. 5 and ASX, *Envestra company announcement*, 26 October 2010, viewed 27 January 2011<http://www.asx.net.au/asxpdf/20101026/pdf/31tcv1nblp4xqc.pdf> Envestra, *Revised Qld access arrangement information*, March 2011, attachment 9-10 (*Other rate of return Issues*), p. 1.

- All of the asset sales/purchases occurred prior to the GFC when debt market liquidity and refinancing risk were significantly lower. This occurred in a period where the regulated returns to equity were significantly higher than those being currently determined by the AER.

The AER maintains the conclusion reached in its draft decision,[39] and considers the following:

- [Text removed – c-i-c]. However, Envestra has stated publicly in its ASX announcement that the purchase price ($107 million) was based on a 70:30 ratio between regulated and non-regulated assets. Based on this information, the AER considers it is still appropriate to compare the component of the purchase price dedicated to regulated assets (70 per cent of $107 million, or $74.9 million) against the value of regulated assets (the 2010 RAB, or $60.8 million). This implies a 25 per cent premium associated with the purchase.

- The AER's draft decision accepted that there may be a number of reasons for recent asset sales being transacted at RAB multiples of greater than one. However, the AER considers observed premiums of this magnitude are unlikely to be explained fully by these factors.

- The AER's decision on the WACC is set independently of the RAB multiples analysis and has instead been conducted only for the purposes of a 'reasonableness check'.

A.1.3 Cost of equity vs. cost of debt

The AER's draft decision identified that the cost of debt has not been higher than the cost of equity in any of its decisions. It is valid to assume that the return on equity would typically be higher than the return on debt. The AER outlined a number of points when examining why the cost of equity crossed over to be lower than the cost of debt in the period January to June 2009.[40]

The AER considers this outcome implies that the DRP allowed in this period was unusually high. The pressures on the Australian money markets during this period were acknowledged by the RBA in its June 2009 bulletin. In the bulletin, the RBA stated the success of their actions suggested that liquidity risk has been a factor in elevated spreads.[41]

In this context, the AER considers that long-term investors are afforded an incremental return for holding the market portfolio in the form of the market risk premium over the long-term. This return compensates long-term investors for bearing short-term market volatility arising from events such as the GFC (i.e. liquidity crisis for debt markets). The AER considers that recent data suggest that bonds have been issued at much lower yields than the debt margins used in the analysis by CEG. If debt margins are based on more recent data, the relative position of the cost of debt

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39 AER, *Draft decision*, February 2011, pp. 56–57, 234–237.
40 AER, *Draft decision*, February 2011, p. 243.
41 Reserve Bank of Australia, *Bulletin - The Australian Money Market in a Global Crisis*, June 2009

and the cost of equity should not be present. The MRP and DRP parameters are discussed in detail in sections A.4 and A.5 respectively.

A.1.4 Credit rating metrics

Envestra proposed to use analysis of credit rating metrics as an appropriate model for setting its cost of equity. The AER rejected this proposal in its draft decision, and maintains its considerations in this final decision, for the reasons set out in section A.2.1.

Consistent with the APT Allgas final decision, the AER considers that the comparison of specific financial ratios against the Standard and Poor's credit ratings benchmark does not imply that the overall rate of return set by the AER will prevent a the benchmark regulated firm from obtaining a BBB+ credit rating. In particular, the AER considers the stability of Envestra as a regulated entity will, according to Standard and Poor's, 'relax' the financial ratios associated with particular ratings.[42]

In its access arrangement proposal, Envestra stated the following:[43]

- It will use the funds from operation (FFO) interest cover (≥ 2.3 times) and FFO to total debt (>9 per cent) as the target BBB+ credit rating metric levels in selecting its WACC. These levels have been publicly stated by Standard and Poor's, amongst other parameters, to be the required metrics for Australian regulated utilities to achieve a BBB+ credit rating.

- These metrics represent the best estimate of what is required to attain and sustain the BBB+ benchmark credit rating.

- Its analysis of recent gas network regulatory decisions indicated that the AER's standard equity premium of 5.2 per cent (i.e. 0.8 beta multiplied by 6.5 per cent MRP), gearing of 60 per cent and a value of imputation credits of 65 per cent do not support a credit rating of BBB+.

The AER does not accept Envestra's conclusion that the overall rate of return set by the AER cannot sustain a credit profile consistent with a benchmark BBB+ credit rating. The AER acknowledges that cash flow based ratios (in particular, FFO to interest cover and FFO to total debt) are used by Standard and Poor's in making credit rating assessments.[44] The AER considers that the target credit rating metrics presented by Envestra—FFO to interest cover of ≥2.3 times, and FFO to total debt of ≥9 per cent—are not accurate, since these ratios are determined by reference to:

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42 Standard and Poor's, *Criteria Methodology: Business Risk/Financial Risk Matrix Expanded*, 27 May 2009, pp. 4–5

43 Envestra, *Revised Qld access arrangement information*, March 2011, pp. 143–145.

44 AER, *Final decision, WACC review*, pp. 374–376, 385–386.

- a 2001 Standard and Poor's guideline that has been superseded.[45] More recent documents from Standard and Poor's do not present precise ratios or omit them entirely.[46]

- specific Standard and Poor's rating assessments for three individual businesses, which present metrics for the circumstances of that particular business, but do not state that these have general relevance.[47]

Most importantly, the AER considers that, although the cash flow based ratios are relevant indicators, there are many other quantitative and qualitative factors which Standard and Poor's considers in its assessment of a credit rating. This point is emphasised in the 2008 Standard and Poor's corporate ratings criteria:

> We strive for transparency around the rating process. However, it is critical to realize—and it should be apparent—that the ratings process cannot be reduced to a cookbook approach: Ratings incorporate many subjective judgments, and remain as much an art as a science.
>
> …
>
> Credit ratings often are identified with financial analysis—especially ratios. And we publish ratio statistics and benchmarks both for sectors and individual companies. But ratings analysis starts with the assessment of the business and competitive profile of the company. Two companies with identical financial metrics are rated very differently, to the extent that their business challenges and prospects differ.[48]

In its 2009 Criteria Methodology, Standard and Poor's noted:

> Still, it is essential to realise that the financial benchmarks are guidelines, neither gospel nor guarantees. They can vary in non-standard cases: For example, if a company's financial measures exhibit very little volatility, benchmarks may be somewhat more relaxed.
>
> Moreover, our assessment of financial risk is not as simplistic as looking at a few ratios.[49]

The regulatory regime allows Envestra to recover stable revenues, provides incentives for efficient performance, and includes a cost recovery mechanism for significant unforseen events. All of these factors are likely to be considered by Standard and

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45 Envestra, *Revised Qld access arrangement information*, March 2011, pp. 143–145 (footnotes 113, 117–119); source document is Standard and Poor's, *International Utility Ratings and Ratios*, 5 September 2001. This document has been superseded by Standard and Poor's, *Corporate Ratings Criteria 2008*, 15 April 2008; Standard and Poor's, *Criteria Methodology: Business Risk/Financial Risk Matrix Expanded*, 27 May 2009; and Standard and Poor's, *Utilities: Key credit factors: Business and financial risks in the investor-owned utilities industry*, 26 November 2008 (republished 28 October 2010).

46 Envestra cited Standard and Poor's, *Utility Report Card*, March 2011, but the rating guidelines in the previous footnote are also relevant.

47 Envestra cited the individual rating assessments for ElectraNet, Envestra and WA Network Holdings in Envestra, *Revised Qld access arrangement information*, March 2011, pp. 144–145.

48 Standard and Poor's, *Corporate Ratings Criteria 2008*, 15 April 2008, p. 20.

49 Standard and Poor's, *Criteria Methodology: Business Risk/Financial Risk Matrix Expanded*, 27 May 2009, pp. 4–5.

Poor's to relax the credit profile benchmarks against which Envestra is assessed. The AER therefore considers that Envestra's claim for setting the rate of return to meet credit rating metrics is invalid.

A.1.5 Modigliani-Miller theorem

The AER's draft decision presented analysis using the Modigliani-Miller framework to help explain the relationship between the cost of equity and debt in a frictionless market.[50] The theorem was not applied to estimate any parameters or components of the WACC, but as a 'reasonableness check', which suggested the rate of return set by the AER adequately compensated Envestra. Envestra did not dispute this analysis in its revised proposal.

In its draft decision, the AER noted that Professor Davis and Associate Professor Handley both cautioned the use of the Modigliani-Miller theorem to imply a relationship between the costs of debt and equity.[51] They considered the Modigliani-Miller theorem in the presence of risky debt is based on the assumption that equity and debt are priced in the (same) integrated market, rather than being priced in (separate) segmented markets. Further, Davis and Handley stated that when this assumption holds, an exact relationship between the firm's cost of debt and equity can be established. Adopting Professor Grundy's approach that the equity risk premium must be at least 2.67 times the DRP, Davis and Handley considered that if the equity risk premium is less than 2.67 times the DRP, this could imply the equity and debt is priced in:

- an integrated market and the equity risk premium is too low
- an integrated market and the DRP is too high
- in segmented markets and so the Modigliani-Miller theorem cannot be used to infer that the equity is mispriced relative to debt.[52]

In its draft decision, the AER identified that Professor Grundy had not demonstrated which of the three situations above is most likely. The Modigliani-Miller theorem could imply that the DRP is excessive, or that equity and debt is priced in segmented markets.[53]

The AER considers that although the Modigliani-Miller theorem is conceptually sound, it is limited by simplifying assumptions (such as the absence of taxes and bankruptcy costs) that diminish its use in estimating a 'real world' rate of return. Nonetheless, this framework remains a useful starting point for a theoretical check on the overall rate of return. While being aware of its limitations as an estimation tool, the AER applied the Modigliani-Miller proposition two as a conceptual reasonableness check of the AER's WACC. This analysis based on the return required

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50 AER, *Draft decision*, February 2011, pp. 243–245.
51 Davis, *Cost of equity*, January 2011, p. 19 and Handley, *Memorandum: Peer Review of Draft Report by Davis on the Cost of Equity*, 18 January 2011, pp. 9-10 (Handley, *Peer review of Davis report*, January 2011).
52 Handley, *Peer review of Davis report*, January 2011, pp. 9–10.
53 AER, *Draft decision*, February 2011, pp. 243–245.

for unlevered equity indicated that the AER's WACC does not under compensate the service provider. Utilising the same approach from the draft decision, the AER has calculated the return on unlevered equity using the upper bound parameters from the Envestra revised proposal.[54] The Modigliani-Miller proposition two implies that this unlevered return on equity, of 9.12 per cent, is an appropriate WACC. This compares with the AER's WACC of 9.77 per cent for this final decision.

A.1.6 Conclusion

The AER considers that the analyses of market data support the conclusion that the rate of return established by the AER is commensurate with the prevailing conditions in the market for funds and the risks involved in providing reference services.[55] The rate of return determined in this decision is at least sufficient to meet the cost of capital faced by regulated service providers.[56]

A.2 Cost of equity models

This section addresses in detail three important questions regarding cost of equity models, all of which relate to the fulfilment of r. 74 and r. 87 of the NGR:

- Is the Envestra multiple-model approach well accepted?
- Is the capital asset pricing model (CAPM) biased?
- Is the Black CAPM a better alternative?

A.2.1 Is the Envestra multiple-model approach well accepted?

The AER considers that there is no hierarchy within r. 87 of the NGR such that a particular requirement can be overlooked by reference to a 'more important' clause.[57] Most relevantly, it is not acceptable to justify the use of a model that is not well accepted (and so does not meet r. 87(2)(b) of the NGR) by arguing that it produces a rate of return commensurate with prevailing market conditions (in accordance with r. 87(1) of the NGR). The cost of equity model must meet all relevant rule requirements.[58]

A key reason for the AER's rejection of Envestra's proposed cost of equity in the draft decision was that, although the CAPM was mentioned in its original proposal, it was not applied to primarily determine the proposed cost of equity. Instead, various alternative models and methods were used to generate the cost of equity in Envestra's original proposal.[59] This 'multiple-model approach' was not demonstrated to be a well accepted financial model.[60]

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54 Based on 8.0 per cent for MRP and 1.1 for equity beta.
55 NGR, r. 87(1).
56 NGL, s. 24(2)(a).
57 AER, *Final decision, Jemena Gas Networks, Access arrangement proposal for the NSW gas networks*, 1 July 2010 – 30 June 2015, June 2010, p. 114.
58 This includes r. 74 of the NGR in addition to r. 87 of the NGR.
59 AER, *Draft decision*, February 2011, pp. 57–58, 60–61.
60 AER, *Draft decision*, February 2011, pp. 60–64.

Envestra stated that the AER draft decision misinterpreted Envestra's approach to setting the cost of equity, in that the alternative asset pricing models/methods were used only as cross-checks for the CAPM.[61] The revised proposal stated that the proposed cost of equity is based on the CAPM and has been selected to be consistent with estimates derived from other asset pricing models.[62]

The AER maintains its position that the 'use' of a model in r. 87(2)(b) of the NGR refers to whether or not that model plays a substantive role in the estimation of the cost of equity.[63] In accordance with r. 87(2)(b), the CAPM is acceptable as the primary determinant of the cost of equity. However, the AER considers that there remains considerable ambiguity in the Envestra revised proposal about the relative weight given to the CAPM or to the alternatives put forward by Envestra (three models and two methods).[64]

From the evidence available, it appears that the cost of equity proposed by Envestra is driven by the SFG 'market-based' assessment using dividend yields, rather than the CAPM. SFG's assessment is the only one of the six models/methods with a different estimate since the original Envestra proposal,[65] with SFG revising the cost of equity estimate down from 13–14 per cent to 11.5–12.5 per cent.[66] In keeping with this change, Envestra has lowered its proposed cost of equity from 13.02 per cent to 12.0 per cent.[67] As a result, it appears that SFG's assessment is the primary driver of Envestra's proposed cost of equity.

Envestra does provide a 'CAPM' derivation of the 12.0 per cent estimate for the cost of equity.[68] However, this derivation is after adjustment to the CAPM input parameters to eliminate the 'low beta bias' that Envestra claimed is inherent to this model. For the reasons discussed in section A.2.2 of this appendix, the AER considers that the CAPM does not have a 'low beta bias'. Rather, it appears that Envestra's 'low beta bias' adjustment is designed to transform the (standard) CAPM into the Black

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61 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 9-10 (Other rate of return issues), p. 2 (section 9.5).

62 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 9-12 (Proposed rate of return), p. 1 (section 9.1).

63 AER, *Draft decision*, February 2011, p. 61.

64 The alternative models are the Black CAPM, DGM and Fama–French three–factor model (FFM). The two alternative methods are 'market-based' assessment using dividend yields and cash flow analysis to meet credit rating metrics.

65 CEG has also updated its DGM based estimate, but the resulting (quite broad) range for the cost of equity remains largely unchanged from the original proposal (after adjustment for the presentation of differing gamma values). For clarity, the AER does not consider that this DGM is accurate or reliable. CEG, *Estimating the cost of capital under the NGR: A report for Envestra*, September 2010, pp. 38–39 (tables 6 and 7) (CEG, *Cost of capital under the NGR*, September 2010); CEG, *WACC Estimation: A report for Envestra*, March 2011, p. 28 (table 3) (CEG, *WACC estimation*, March 2011).

66 For clarity, the AER does not consider that this estimate is the correct interpretation of the dividend yield evidence. SFG, *Required return on equity*, September 2010, p. 2 (paragraph 5); and SFG, *Required return on equity response*, March 2011, p. 3 (paragraph 6).

67 Although Envestra's headline cost of equity declines by 1.02 per cent, the rise in the risk free rate means that the Envestra equity risk premium has actually declined by 1.32 per cent in the revised proposal. This is quite close to the 1.5 per cent decline in the SFG estimate (which is invariant to the risk free rate).

68 Specifically, a risk free rate of 5.6 per cent, equity beta of 0.98 and MRP of 6.5 per cent.

CAPM.[69] The AER considers that this represents a de–facto application of the Black CAPM, not the standard CAPM.

Of the alternative models/methods, the revised proposal presents no further evidence on the acceptance of any of these models/methods, or on the acceptance of the multiple-model approach employed by Envestra.[70] The AER therefore confirms its draft decision that:

- the Black CAPM and Fama–French three–factor model (FFM) are not well accepted, since there is no evidence that these models are used by any of the relevant groups—namely regulators, academics and market practitioners[71]

- the dividend growth model (DGM) is not well accepted for use in the Australian context, since there are no reliable Australian inputs for the model and no evidence that it is used by any of the relevant groups in Australia[72]

- the two methods (market assessment and cash flow analysis to meet credit rating metrics) are neither financial models nor well accepted[73]

- the overarching multiple-model approach is not well accepted since this primarily depends on the acceptance of the constituent models and these are not well accepted models.[74]

Given the ambiguity in the Envestra proposal, it is not clear exactly how much weight has been given to each of the alternative models and methods. However, it is evident that various models and methods that are not well accepted financial models outweigh the use of the CAPM. Accordingly, the AER does not accept Envestra's proposal on cost of equity models.

A.2.2 Is the CAPM biased?

The key question proposed by Envestra is: 'Can one be sure that the AER's method of implementing the Sharpe CAPM will result in a bias?'[75] The AER considers that there is no reasonable basis to conclude that the CAPM which it implements results in a bias.[76]

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69 CEG, *WACC estimation*, March 2011, pp. 5–6, 10 (paragraphs 17–19, 39).

70 For clarity, the Envestra revised proposal does present new evidence on the *accuracy/reliability* of the CAPM and Black CAPM, but this is a separate issue from whether or not these models are well accepted.

71 AER, *Draft decision*, February 2011, pp. 63.

72 AER, *Draft decision*, February 2011, pp. 63.

73 While there is some ambiguity, it appears that Envestra has withdrawn the latter method (cash flow analysis to meet credit rating metrics) as a means to determine the cost of equity.

74 AER, *Draft decision*, February 2011, p. 62.

75 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 9-8 (*Response to AER draft decision on equity beta*), p. 2 (footnote 4).

76 For clarity, there remains some possibility that the AER is over compensating the benchmark firm—i.e. there is a bias *in favour* of the benchmark firm. The primary cause of this bias is the conservative estimate of beta, discussed later in the chapter.

Academic papers on the CAPM

The key evidence put forward that the CAPM has a 'low beta bias' is based on a particular type of empirical test, which plots the average beta of share portfolios against the realized returns on these portfolios. The result of this type of test is that the estimated return on shares with betas less than one is higher than that predicted by the CAPM, and vice versa. All consultants (Grundy, CEG, Davis and Handley) acknowledged this empirical finding,[77] as stated in a quote from CEG (which purports to quote Associate Professor Handley):

> …there is no dispute concerning the results reported by Black, Jensen and Scholes (1972), Fama and Macbeth (1973) and Fama and French (2004)…[78]

It does not follow that this empirical test proves that the CAPM is incorrect.[79] Rather, the full quote from Associate Professor Handley is:

> **Whilst** there is no dispute concerning the results reported by Black, Jensen and Scholes (1972), Fama and Macbeth (1973) and Fama and French (2004), **it is important to note that there remains considerable uncertainty as to how this empirical evidence should be interpreted – in other words, what do the empirical results, concerning past realized returns, imply about the validity of the Sharpe CAPM as a model for estimating future expected returns?** [emphasis added][80]

The AER considers that the conclusion from the academic literature is that there are inherent defects in this test of the CAPM. This is not particularly unexpected. There is an inherent difficulty in designing a test for a conceptual model that explains the equilibrium pricing of all assets in the economy. As a result, some defects are likely. The AER's draft decision listed a number of the critical problems with the type of empirical test Envestra appears to have relied on, all of which are readily recognised in the academic literature.[81] This type of test:

- uses a market proxy that does not accord with the CAPM market[82]
- considers *realised* returns, when the CAPM deals only with *expected* returns[83]

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77 Grundy, *The calculation of the cost of capital: A report for Envestra*, 20 September 2010, pp. 2–3 (Grundy, *Calculation of the Cost of capital*, September 2010); CEG, *Cost of capital under the NGR*, September 2010, pp. 9, 14–15, 19; Davis, *Cost of equity*, January 2011, p. 11; Handley, *Peer review of Davis report*, January 2011, pp. 2–3; Grundy, *Comment on the cost of capital: A report for Envestra*, 23 March 2011, p. 2 (paragraph 5) (Grundy, *Comment on the cost of capital*, March 2011); and CEG, *WACC estimation*, March 2011, pp. 3–6; and Davis, *Cost of equity further report*, May 2011, p. 3.

78 CEG, *WACC estimation*, March 2011, p. 5 (paragraph 14). CEG is citing Handley, *Peer review of Davis report*, January 2011, p. 3.

79 Davis, *Cost of equity*, January 2011, pp. 3–4, 11.

80 Handley, *Peer review of Davis report*, January 2011, p. 3.

81 See AER, *Draft decision*, February 2011, pp. 66–67.

82 See Davis, *Cost of equity*, January 2011, p. 7–8 and Davis, *Cost of equity further report*, May 2011, pp. 3–4, 18–19; source papers include Roll, R., 'A critique of the asset pricing theory's tests; Part I: On past and potential testability of the theory', *Journal of Financial Economics*, 1977, vol. 4, pp. 129–176; and Levy, M. and R. Roll, 'The market portfolio may be mean/variance efficient after all', *Review of Financial Studies*, 2010, vol. 23(6), pp. 2464–2491.

- uses short-term (less than one month) intervals, when the CAPM period needs to be the (longer) investment horizon[84]

- uses inappropriate statistical tests or procedures.[85]

The consultant reports submitted by Envestra also acknowledged the existence and severity of some of these problems.[86]

It might appear possible to conclude that, despite the problems with this test of the CAPM, there is sufficient evidence to suggest that the CAPM itself is biased. This is exactly the question identified by Professor Davis in his original report to the AER:

> More generally, researchers will aim to identify whether empirical 'failures' of a model are due to its core assumptions being invalid, or whether 'auxiliary' assumptions required to implement or test the model are the cause of failure.[87]

There is evidently disparity in the views of the academic reports before the AER (and indeed no consensus in the broader academic literature) on this further claim.[88] Fundamentally, pointing to this flawed empirical finding provides no logical basis to then simply assert that the CAPM itself has been disproved.

It is in this context that Davis examines more recent tests of the CAPM.[89] These tests variously correct one (or two) of the flaws with the classic empirical tests, and then find stronger support for the CAPM. The AER considers that this supports the inference that the CAPM itself holds, and that the primary reason for the 'low beta bias' empirical finding is a flawed testing procedure. Of course, even these updated tests still retain some problems which, as discussed above, are inherent in tests of this kind of conceptual model.

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83 See Davis, *Cost of equity*, January 2011, p. 7 and Davis, *Cost of equity further report*, May 2011, p. 19; source papers include Campello, M., L. Chen and L. Zhang, 'Expected returns, yield spreads and asset pricing tests', *Review of Financial Studies*, 2008, vol. 21(3), pp. 1298–1338.

84 While there is no agreement on the exact length of the investment horizon, there is consensus that a one month period is too short. See Davis, *Cost of equity*, January 2011, p. 5 and Davis, *Cost of equity further report*, May 2011, pp. 11, 22; source papers include Cohen, R., C. Polk and T. Vuoteenaho, 'The price is (almost) right', *Journal of Finance*, 2009, vol. 64(6), pp. 2739–2782; and Levhari, D., and H. Levy, 'The capital asset pricing model and the investment horizon', *Review of Economics and Statistics*, 1977, vol. 59(1), pp. 92–104.

85 See Davis, *Cost of equity*, January 2011, p. 6 and Davis, *Cost of equity further report*, May 2011, pp. 4–6, 19, 21–22; source papers include Ray, S., N. E. Savin and A. Tiwari, 'Testing the CAPM revisited', *Journal of Empirical Finance*, 2009, vol. 16(5), pp. 721–733; Lewellen, J., S. Nagel and J. Shanken, 'A sceptical appraisal of asset pricing tests', *Journal of Financial Economics*, 2010, vol. 96(2), pp. 175–194; and Grauer, R., and J. Janmaat, 'Cross-Sectional tests of the CAPM and Fama–French three–factor model', *Journal of Banking and Finance*, 2010, vol. 34, pp. 457–470.

86 For example, Grundy, *Calculation of the cost of capital*, September 2010, pp. 6–7; CEG, *Cost of capital under the NGR*, September 2010, pp. 16 (paragraph 35).

87 Davis, *Cost of equity*, January 2011, p. 3. Note that a similar statement by noted CAPM antagonists Fama and French is quoted in Handley, *Peer review of Davis report*, January 2011, p. 3.

88 Davis, *Cost of equity further report*, May 2011, p. 11.

89 Davis, *Cost of equity*, January 2011 and Davis, *Cost of equity further report*, May 2011, pp. 3–11, 18–23.

In particular, Davis disagreed with Grundy's interpretation of several academic papers, which Grundy stated contain evidence that the CAPM under compensates low beta firms. Among comments on a range of papers, Davis noted that:

- The seminal 1977 paper by Roll supports the position that the 'low beta bias' empirical finding results from a problem with the test (a mis-specified market portfolio) not a problem with the underlying CAPM. Roll explicitly notes that the papers by Black, Jensesn and Scholes (1972) and Fama and MacBeth (1973) are fully compatible with the CAPM in the presence of such a testing error.[90]

- Campello, Chen and Zhang's 2008 paper appears to have been misinterpreted by Grundy, and Davis considered that the correct interpretation of their results does not indicate that the CAPM under compensates firms with a beta less than one.[91]

- The 2009 paper by Cohen, Polk and Vuolteenaho is still relevant to evaluation of the CAPM, even though it uses an alternative method for beta estimation. Grundy cited results from Table V of this paper as rejecting the CAPM, but this overlooks Tables IV and VI which provide results that support the opposite conclusion.[92] Overall, Davis considered that this paper supports the position that deficient testing procedures (in this case, portfolio construction methods) lead to the 'low beta bias' empirical finding.[93]

- The main finding from the 2010 paper by Grauer and Janmaat is that deficiencies in standard testing procedures (such as inappropriate portfolio formation methods, and use of ordinary least squares regression) are the reason for empirical results that reject the CAPM. Further, changes to these testing procedures (such as repackaging portfolios and using generalised least squares regression) produce results that strongly support the CAPM as correct.[94]

Implementation of the CAPM

CEG criticised an implementation of the CAPM that does not match either the classic tests of the MRP (which produce the 'low beta bias' empirical finding referred to above) or the implementation adopted by the AER.

The first mismatch concerns the form of the risk free rate used in the CAPM, which CEG characterised as follows:

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90 Davis, *Cost of equity further report*, May 2011, p. 18. source paper is Roll, R., 'A Critique of the Asset Pricing Theory's Tests; Part I: On Past and Potential Testability of the Theory', *Journal of Financial Economics*, 1977, vol. 4, pp. 129–176.

91 Davis, *Cost of equity further report*, May 2011, p. 19; source paper is Campello, M., L. Chen and L. Zhang, 'Expected returns, yield spreads and asset pricing tests', *Review of Financial Studies*, 2008, vol. 21(3), pp. 1298–1338.

92 Further, the base data in table V does not reject the CAPM either; it is only the additional portfolio sorts that produce intercepts which differ significantly from zero (and thus reject the standard CAPM).

93 Davis, *Cost of equity further report*, May 2011, pp. 22–23; source paper is Cohen, R., C. Polk, and T. Vuolteenaho, 'The Price is (Almost) Right', *The Journal of Finance*, 2009, vol. 64(6), pp. 2739–2782.

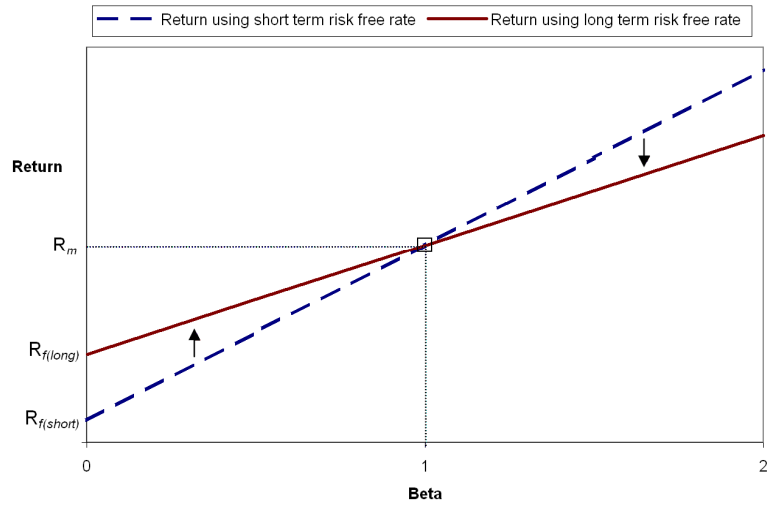
94 Davis, *Cost of equity further report*, May 2011, pp. 21–22; source paper is Grauer, R., and J. Janmaat, 'Cross-sectional tests of the CAPM and Fama–French three-factor model', *Journal of Banking and Finance*, 2010, vol. 34, pp. 457–470.

> The prevailing government bond rate is used as a proxy for the risk free rate[95]
>
> The relationship between returns and beta is…such that zero beta equity earns a return equal to the Government bond rate[96]

This does not accurately describe the empirical studies that find the 'low beta bias', where the 'government bond rate' is the interest rate on short term government securities with a one month maturity (and more normally described as the 'government bill rate' in these USA based studies). In contrast, the AER sets the risk free rate (and therefore the return on equity using the CAPM) using the 10 year government bond rate. The 10 year government bond rate is currently materially above the 30 day bill rate.[97]

The effect of choosing a longer term for the risk free rate results in an increase to the estimated return on equity for shares with a beta below one (and vice versa). In other words, choosing a longer term for the risk free risk already achieves the sort of correction that CEG claimed is required to offset the 'low beta bias' of the CAPM. This is best illustrated by reference to figure A.1.

Figure A.1 Effect of using different risk free rates on the CAPM cost of equity



Source: AER analysis.

95 CEG, *Cost of capital under the NGR*, September 2010, p.14 (para 31)

96 CEG, *WACC estimation*, March 2011, p. 6 (para 23).

97 For the averaging period (15 days to 17 March 2011), the difference between annualised Australian Government one-month bills and ten-year bonds (both annualised) is 72 basis points based on RBA data. Brailsford, Handley and Maheswaran document the difference as being 50–60 basis points over the long-term (using their MRP time series from 1883, 1937 and 1958). However, this is against 90 day treasury bills, and the difference would be greater if 30 day treasury bills were used. The difference is much larger for historical series in the US (i.e. the academic literature cited by Grundy, Davis and CEG that documents the low-beta bias). For example, the difference is 180 basis points for the period 1931 to 1965 examined by Black, Jensen and Scholes, based on Ibbotson and Sinquefield data. See Brailsford, T., J. Handley and K. Maheswaran, 'Re-examination of the historical equity risk premium in Australia', *Accounting and Finance*, 2008, vol. 48, pp. 73–97; Black, F., M. Jensen, and M. Scholes, 'The capital asset pricing model: Some empirical tests', in *Studies in the theory of capital markets*, M. Jensen (editor), Praeger Publishers' and Ibbotson, R., and R. Sinquefield, 'Stocks, bonds, bills and inflation: Year-by-year historical returns (1926–1974)', *Journal of Business*, 1976, vol. 49(1), pp. 11–47.

The average market return on stocks, R_m, shown in figure A.1 as the small square directly above a beta of 1.0, is measured directly and is unaffected by the term of the risk free rate, R_f.[98] The steeper dashed line shows the estimated cost of equity when the CAPM is applied using a short term R_f. This is the security market line that CEG considered inaccurate, but the AER's implementation of the CAPM does not achieve this outcome. Rather, the AER implements the CAPM using a long term R_f, which results in the estimated cost of equity shown by the flatter solid line. Relative to the steeper dashed line, the flatter solid line produces higher (lower) estimates for stocks with a beta below (above) one, in accordance with the 'correction' claimed by CEG.[99]

The second mismatch concerns the MRP. CEG characterised the MRP as:

> …estimated based on an estimate of a long run average market risk premium rather than a specific estimate for the period in question.[100]

This accurately describes the majority of empirical studies but does not correctly describe the AER's approach. The AER sets the MRP with regard to the specific period in question.[101] As a result, the AER may set a different MRP from time to time, as appropriate.[102] The CAPM implementation that CEG criticised (and which is the subject of the flawed empirical tests which report the 'low beta bias') cannot accommodate these types of changes.

As noted by Professor Davis, the AER is using an 'implicit conditional CAPM' approach,[103] not a strict static CAPM.[104] Given that there is no consensus in the academic literature about the correct implementation of an explicit conditional CAPM, the AER's approach represents the best estimate possible in the circumstances.[105]

A.2.3 Is the Black CAPM a better alternative?

Envestra's revised proposal focused on just one of the three alternative models to the CAPM—the Black CAPM. The central argument from Envestra and its consultants is

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98 This statement presumes both appropriate conversion of units and that arithmetic averages are used to determine the market return, not geometric averages.

99 Below, the extent of the 'low beta bias' is discussed with reference to four academic studies by calculating a particular ratio. Taking account of the difference between the short–term and long–term risk free rate in each study would raise all ratios by between 0.06 and 0.49, bringing four ratios to 1.0 or above. A ratio of 1.0 indicates that the CAPM is accurate and there is no 'low beta bias'.

100 CEG, *Cost of capital under the NGR*, September 2010, p. 14.

101 For clarity, information on the long run average MRP is still a relevant input for consideration of the MRP that will apply for the specific period in question.

102 This is evident from the AER's previous assessment of an MRP of 6.5 per cent and the current assessment that 6 per cent is the best estimate under the current circumstances, in accordance with the best estimate of the MRP that would apply for the relevant 10-year period commencing at the start of the access arrangement period concerned.

103 Davis, *Cost of equity*, January 2011, p. 9 and Davis, *Cost of equity further report*, May 2011, p. 9.

104 CEG, *Estimating the cost of capital under the NGR*, September 2010, pp. 13–14.

105 Davis, *Cost of equity*, January 2011, p. 9; Handley, *Peer review of Davis report*, January 2011, p. 5.

that the Black CAPM is a better predictor of the return on equity than the standard CAPM applied by the AER.[106]

The AER considers that the Black CAPM is unreliable because robust parameter inputs for the model are not available. The AER's draft decision noted the importance of having robust parameter inputs and this requirement has been endorsed by Envestra's consultant.[107] The Black CAPM uses the return on the zero beta portfolio as an input. This parameter is difficult to estimate. The AER considers that Envestra has not presented a robust estimate of the return on the zero beta portfolio.

Envestra primarily relied on analysis of the academic literature by Professor Grundy to estimate the zero beta return. The AER considers that this is an unreliable basis for generating the zero beta estimates because:

- The estimates are based on just three published academic papers and one academic working paper that has not yet been published. Further:
  - The published papers are dated (published in 1972, 1973 and 1995).
  - These papers are all based on US data, not Australian data.
- The estimates themselves are internally inconsistent where the regression equation involves a risk free rate. That is, the Black CAPM assumes that the risk free rate does not exist. However, these estimates of the zero beta return are generated by using a risk free rate, for use as an input to the Black CAPM.[108]
- There are theoretical grounds to consider that these estimates are systematically biased and therefore unreliable.[109]

These zero beta estimates are presented by Grundy as a ratio in fraction form:[110]

$$\frac{R_m - R_0}{R_m - R_f}$$

Where R_m is the market return
R_0 is the zero beta portfolio return, and
R_f is the risk free rate

If this calculated ratio equals 1.0 then the Black CAPM exactly matches the standard CAPM. If the calculated ratio is below 1.0, then the Sharpe CAPM and Black CAPM will produce different estimates of the cost of equity. For the relevant shares,[111] a calculated ratio below 1.0 means that the Black CAPM will produce a higher estimate of the cost of equity than the Sharpe CAPM. The lower the calculated ratio, the greater the difference between the Black CAPM and the standard CAPM, and therefore the greater the extent of the 'low beta bias'.

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106 Grundy, *Comment on the cost of capital*, March 2011; CEG, *WACC estimation*, March 2011, pp. 3–10.
107 SFG, *Required return on equity*, September 2010, p. 4 (paragraphs 12–13); Davis, *Cost of equity*, January 2011.
108 Davis, *Cost of equity further report*, May 2011, pp. 4–5, 9–10.
109 Davis, *Cost of equity*, January 2011, p. 11.
110 Grundy, *Calculation of the cost of capital*, September 2010, p. 13–14, 16–17.
111 That is, shares with a beta below 1.0.

Grundy originally calculated ratios between 0.232 and 0.761.[112] As noted by Davis, however, Grundy appears to have assumed an incorrect form for the regression equations and so has misinterpreted several regression coefficients.[113] Briefly, the relevant regression equations use total portfolio return, not portfolio return in excess of the risk free rate as assumed by Grundy. This means that the intercept coefficient should be interpreted as the total return on the zero beta portfolio, not the return on the zero beta portfolio in excess of the risk free rate. Further, the earlier Davis report made a conversion error when recalculating these figures.[114] Corrected ratios from these four academic papers are shown in table A.2.[115]

Table A.2 Estimates of the return on the zero beta portfolio (in ratio form)

Paper	Sort	Ratio	
Black, Jensen and Scholes, 1972	Beta	0.751	
Fama and MacBeth, 1973	Beta	0.639	
Kothari, Shanken and Sloan, 1995	Beta	0.545	
	Size	1.008	
	Beta and size	0.672	
	Beta then size	0.736	
	Size then beta	0.723	
Da, Guo and Jagannathan, 2009	Beta	0.232[a]	0.379[b]
	Aged beta	0.452[a]	0.816[b]
	Industry	0.630[a]	0.965[b]
	Industry and book-to-market	0.936[a]	1.417[b]

Source: Davis, *Cost of equity issues: A further report for the AER*, 13 May 2011, pp. 6–9; AER analysis. All ratios presented are for the longest available time period in the paper. Source papers are Black, F., M. Jensen, and M. Scholes, 'The capital asset pricing model: Some empirical tests', in *Studies in the theory of capital markets*, M. Jensen (editor), Praeger Publishers; Fama, F., and J. Macbeth, 'Risk, return and equilibrium: empirical tests', *Journal of Political Economy*, 1973, vol. 81(3), pp. 607–636; Kothari, S., J. Shanken and R. Sloan, 'Another look at the cross-section of expected returns', *Journal of Finance*, vol. 50(1), pp. 185–224; Da, Z., R. Guo and R. Jagannathan, 'CAPM: Interpreting the evidence', 2009, *NBER working paper 14889*.

a: If the underlying regression equation is against *excess* portfolio returns

b: If the underlying regression equation is against *total* portfolio returns

[112] Grundy, *Calculation of the cost of capital*, September 2010, p. 13.

[113] Davis, *Cost of equity further report*, May 2011, pp. 6–9. See also Grundy, *Calculation of the cost of capital*, September 2010, pp. 13–14, 16–17; Davis, *Cost of equity*, January 2011, pp.11–12; and Grundy, *Comment on the cost of capital*, March 2011, pp. 9–11.

[114] Davis, *Cost of equity further report*, May 2011, pp. 6–9.

[115] There remains uncertainty about the relevant regression equation in the Da Guo and Jagannathan working paper, so table A.2 presents the two possible interpretations.

Based on table A.2, the AER considers:

- Some estimates are close to or above 1.0, which indicates that the zero beta return is equal to the risk free rate. In the (standard) CAPM, the zero beta return is equal to the risk free rate. Therefore, these estimates appear to indicate that the standard CAPM accurately predicts the cost of equity without any 'low beta bias'.[116]

- There is marked variability in the ratios, suggesting either this is not a robust method for estimating this parameter or that the zero beta return is sample specific. In either case a Black CAPM using this input parameter would not provide a reasonable basis for estimating the cost of equity.

Further, Grundy stated the most reliable estimate from the Kothari, Shanken and Sloan paper is that using beta-sorted portfolios, because this produces the largest dispersion in portfolio betas.[117] However, the paper notes that sorting portfolios by size, not by beta, produces the largest dispersion in portfolio betas.[118] Hence, it appears that Envestra's consultant, Grundy, considers the most reliable estimate of the zero beta return ratio to be 1.008, based on size-sorted portfolios. A ratio of 1.0 indicates that the (standard) CAPM exhibits no 'low beta bias' at all.

The Davis report notes dramatic variability in the zero beta return ratio when shorter sub-periods (between five and nine years) are considered, further discrediting any assertion that this is a reliable method to estimate the zero beta portfolio returns.[119] The limited data from Australian studies must be interpreted with caution, but the results are similarly variable.[120]

Finally, there is another estimate of the zero beta return ratio, 0.146, presented by CEG based on its own modelling.[121] Both Davis and Grundy noted that the zero beta return cannot exceed the borrowing rate.[122] Setting the zero beta return based on a ratio of 0.146 would exceed the cost of debt suggested by CEG in the same report, as well as that proposed by Envestra.[123] As a result, the AER considers that this estimate is implausible and should be rejected.[124]

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116 Compare with Grundy, *Comment on the cost of capital*, March 2011, p. 10.

117 Grundy, *Comment on the cost of capital*, March 2011, p. 10 (paragraph 25).

118 Kothari, S., J. Shanken and R. Sloan, 'Another look at the cross-section of expected stock returns', *Journal of Finance*, 1995, vol. 50(1), pp. 193.

119 Davis, *Cost of equity further report*, May 2011, pp. 8–9.

120 In several instances the Australian risk free rate is *above* the zero beta return, suggesting that the (standard) CAPM is already over compensating these businesses relative to the Black CAPM. Davis, *Cost of equity further report*, May 2011, pp. 5–6. Source papers are Durack, N., R. Durand and R. Maller, 'A best choice among asset pricing models? The Conditional Capital Asset Pricing Model in Australia', *Accounting and Finance*, 2004, vol. 44, pp. 139–162; and Gaunt, C., 'Size and book to market effects and the Fama French three factor asset pricing model: evidence from the Australian stockmarket', *Accounting and Finance*, 2004, vol. 44, pp. 27–44.

121 CEG, *Cost of capital under the NGR*, September 2010, p. 19.

122 Davis, *Cost of equity*, January 2011, p. 11; Grundy, *Comment on the cost of capital*, March 2011, p. 8; and Davis, *Cost of equity further report*, May 2011, pp. 10–11.

123 CEG considered that the *minimum* MRP is 7.4 per cent, which at a ratio of 0.146 would equate to a zero beta return of at least 11.92 per cent. The Envestra proposal considers the minimum MRP is 6.5 per cent, which equates to a zero beta return of at least 11.15 per cent. Both estimates are considerably above the proposed 10 year, BBB rated cost of debt of 10.27 as set out in CEG,

Aside from these specific problems with the zero beta return estimates, the AER considers that the academic literature does not support the use of the Black CAPM instead of the (standard) CAPM. In his report, Davis disagreed with Grundy's interpretation of several academic papers, which Grundy stated 'contain information that the Black CAPM does provide a better empirical predictor of expected returns than the Sharpe CAPM does'.[125] Davis also reviewed the recent academic literature referred to by Grundy in his first report. After evaluation of all this evidence, Davis concluded:

> I do not believe that there is substantive evidence in any of the paper surveyed, and on the basis of the discussion earlier in this section, which would provide grounds for a conclusion that the Black CAPM is superior to the Sharpe CAPM.[126]

On the basis of the information presented, the AER does not consider that the Black CAPM provides a reasonable basis from which to estimate the cost of equity, as is required by r. 74(2) of the NGR. The AER considers that the Black CAPM will not produce a rate of return that is commensurate with conditions in the market for funds and the risks involved in providing reference services, as is required by r. 87(1) of the NGR.

A.2.4 Conclusion

Overall, the AER considers that Envestra's approach in relation to cost of equity models does not meet the requirements of r. 87(2)(b) of the NGR. Further, estimates generated by the Envestra approach will not meet the requirements of r. 74(2) and r. 87(1) of the NGR.

The AER instead uses the (standard) CAPM, which is a well accepted financial model, to estimate the cost of equity.[127] The AER considers that the use of the CAPM to estimate the cost of equity:

- complies with the applicable requirements of the NGL and the NGR
- is consistent with the revenue and pricing principles set out in section 24 of the NGL
- will or is likely to contribute to the achievement of the NGO in section 23 of the NGL.

WACC estimation, March 2011, pp. 1–2, 33 (paragraphs 5, 117); Envestra, *Revised Qld access arrangement information*, March 2011, attachment 9-7 (Response to AER draft decision on debt risk premium), p. 4; and attachment 9-9 (*Response to AER draft decision on market risk premium*), p. 7.

124 Further, the estimate is not from a published academic paper and the underlying spreadsheets and calculations were not provided to the AER.

125 Davis, *Cost of equity further report*, May 2011, pp. 2–11, 18–23.

126 Davis, *Cost of equity further report*, May 2011, p. 11.

127 The AER has full discretion (as set out in r. 40(3) of the NGR) over determination of the rate of return to meet the requirements of r. 87 of the NGR. However, given that the Envestra proposal does not meet the requirements of r. 87 of the NGR, the AER is not required to expressly rely on r. 40(3) in electing to use the CAPM.

A.3 Equity beta

This section sets out the AER's consideration of matters raised in the revised proposal regarding the AER's approach to determine the equity beta in the draft decision.

A.3.1 Use of Australian or US data

The key issue in the Envestra revised proposal is whether to rely on estimates of the equity beta generated using US data instead of the estimates based on Australian data.

The adopted benchmark service provider is Australian and the AER sets the rate of return using a domestic CAPM.[128] The AER considers that this provides a strong rationale for estimating all CAPM inputs (such as the equity beta) using Australian data.[129] The use of a foreign proxy is a suboptimal outcome that can only be justified where there is evidence that this will produce more reliable estimates of the domestic equity beta than the Australian estimates.[130] The onus remains on any party (in this case, Envestra and its consultant CEG) wishing to depart from the use of domestic data to establish that a foreign proxy will be more reliable.

This section considers in detail the arguments from CEG on the relative reliability of the Australian and US estimates.

Australian estimates

The CEG report stated that the Australian equity beta estimate used by the AER is unreliable because:

- it is based on an overall sample of just six Australian securities' returns[131]
    - these firms are 'highly volatile'
    - only two of these companies have sufficiently long trading histories
- the highest estimated equity beta (HDF) is given less weight on spurious grounds.[132]

The AER maintains its position from the draft decision that the Australian equity beta estimates (drawn from the WACC review) are sufficiently robust, and considers that the claims by CEG are unfounded. In particular, the equity beta estimates:

- rely on an estimation period (after the technology bubble but before the GFC) that is likely to reflect long-term market conditions going forward[133]

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128 AER, *Draft decision*, February 2011, pp. 63, 249, 257; see also AER, *Final decision, WACC review*, May 2009, pp. 77–82, 255.
129 AER, *Final decision, WACC review*, May 2009, pp. 255, 260–264.
130 AER, *Final decision, WACC review*. May 2009, pp. 260–264, 311–332.
131 CEG, *WACC estimation*, March 2011, pp. 1, 20–21.
132 CEG, *WACC estimation*, March 2011, p. 1.
133 AER, *Final decision, WACC review*, pp. 267–271; and AER, *Draft decision*, February 2011, pp. 246–247.

- the period (around five years) is long enough to provide statistically robust equity beta estimates when using weekly and monthly trading intervals[134]
- estimates during this period are not 'highly volatile'[135]

- rely on an overall sample of nine companies, not six[136]
  - five of these companies (not two) have trading histories of around five years[137]
  - all nine companies have trading histories that are sufficiently long to permit reasonable assessments to be made[138]
  - portfolio analysis across the entire period (around five years) appropriately incorporates firms with shorter duration trading histories[139]

- rely on appropriate statistical analysis
  - using an appropriate formula to adjust for leverage[140]
  - using estimation intervals (weekly and monthly) that mitigate problems arising from trading bias[141]
  - checking for problems such as autocorrelation and heteroscedasticity.

CEG stated there are only two Australian companies with sufficiently long trading histories based upon an AER statement in the draft decision.[142] CEG appears to misconstrue this to mean that a company must have more than 850 trading days of data before it provides a reasonable basis for a reliable beta estimate.

The AER rejected CEG's analysis of Australian equity beta estimates because it used (up to) 600 days of data *during the GFC*.[143] It is not the length of the estimation period alone, but the combination of period length and period timing that renders this analysis unreliable.[144] As stated in the draft decision, the minimum length for reliable

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134 AER, *Final decision, WACC review*, pp. 271–275.
135 AER, *Final decision, WACC review*, pp. 278–292, 326–328.
136 The CEG report overlooked the WACC review consideration of Alinta (AAN), Australian Gas Light (AGK) and GasNet Australia (GAS). AER, *Final decision, WACC Review*, May 2009, pp. 255, 307–311, 317–320.
137 In addition to APA Group (APA, six years and eight months) and Envestra (ENV, six years and eight months) the WACC review analysis includes AAN (five years and eight months), AGK (four years and ten months), and GAS (four years and eleven months). AER, *Final decision, WACC review*, May 2009, pp. 255, 317–320; and Henry, *Estimating beta*, 23 April 2009, pp. 10–11, 14–15.
138 AER, *Final decision, WACC review*, pp. 255–260; see also discussion on the minimum length for the estimation period in this appendix.
139 AER, *Final decision, WACC review*, pp. 307–311, 320–326.
140 AER, *Final decision, WACC review*, pp. 265–267.
141 AER, *Final decision, WACC review*, pp. 275–278.
142 CEG stated 'The AER has rejected the relevance of beta estimates I presented because they were only based on 600 trading days (or around 2.4 years).' CEG, *WACC estimation*, March 2011, pp. 20–21 (paragraph 67).
143 AER, *Draft decision*, February 2011, pp. 246–248.
144 Davis, *Cost of equity*, January 2011, p. 18.

beta estimation is a function of the underlying conditions, and during the GFC conditions were such that beta estimation became much more inaccurate than normal.[145] This means that a period length which may have been appropriate during normal conditions would be inappropriate when chosen during the GFC. Hence, there is no contradiction in the AER's rejection of the CEG analysis (using up to 600 trading days), and the use of companies with similar length trading histories in the WACC review.[146]

The AER clarifies that it was not attempting to define a specific start date for the GFC in its draft decision.[147] The AER acknowledges that there is no real consensus on the precise beginning of the GFC, or (more relevantly) about the date when it began to substantially affect Australian equity prices (and therefore equity beta estimation). There is some justification for using an estimation period ending on 1 September 2008, given that the ASX All Ordinaries index had its steepest fall across the subsequent two months (a decline of around 25 per cent). On the other hand, this sharemarket index fell by 11 per cent in January 2008, supporting an estimation period ending on 31 December 2007. Nonetheless, the AER considers that its analysis of equity betas using a period of five and a half years would not be unduly influenced by the eight months to September 2008.[148] CEG has not presented evidence that Australian equity betas would differ if the estimation period ended in 2007.

Envestra's revised proposal stated that 'the AER gives less weight to the highest estimated beta for the Australian sample', apparently based on the executive summary of the CEG report.[149] However, there is no analysis to support this claim in the body of the CEG report. The AER considers that it has given appropriate weight to the Hastings Diversified Utilities Fund (HDF) equity beta, including it in portfolios with equal or value weighting (as relevant), and in its analysis of aggregate individual equity betas.[150] The AER did note that caution should be used in interpreting the equity beta for HDF produced by CEG, which was more than three times the next highest estimate.[151] However, giving 'full weight' to the CEG estimate for HDF still produces an equity beta estimate which accords with the range from the AER's WACC review.[152]

The empirical evidence available to the AER suggests an equity beta of between 0.4 and 0.7 ensures the service provider has the opportunity to recover at least its efficient costs incurred in providing reference services and in meeting regulatory requirements.

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145 AER, *Draft decision*, February 2011, p. 248.

146 For clarity, the AER considers that the shorter periods presented by CEG would be inappropriate, even without consideration of the specific period. The minimum period analysed by CEG is just 20 trading days. Such a period would be inappropriate regardless of whether it is measured during the GFC. The AER considers that a period less than a year (240 trading days) is likely to be too short for reliable estimation, regardless of the location of that period.

147 AER, *Draft decision*, February 2011, pp. 246–247.

148 The WACC review also considered five year equity beta estimates (from ACG) ending in May 2008, with similar results to those ending in September 2008. AER, *Final decision, WACC review*, May 2009, pp. 320–321.

149 Envestra, *Revised Qld access arrangement information*, March 2011, attachment 9-8 (*Response to the AER decision on equity beta*), p. 1; CEG, *WACC estimation*, March 2011, p. 1.

150 AER, *Final decision, WACC review*, May 2009, pp. 317–328.

151 AER, *Draft decision*, February 2011, p. 69.

152 As shown in table 5.6 of chapter 5.

Based on this information, an equity beta of 0.8 would not under compensate the benchmark service provider for the risks of providing reference services.

The AER has cross-checked this by obtaining a recent Grant Samuel independent report which used an equity beta estimate of 0.8 to 0.9, suggesting that the equity beta estimates for energy distribution businesses remain unchanged as a consequence of the GFC.

US estimates

CEG stated that instead of Australian equity beta estimates, its US equity beta estimates (but not the US equity beta estimates from the AER's WACC review) should be used in the domestic CAPM. CEG stated that:

- there is a larger pool of available data for estimating equity betas[153]
    - there are 77 US regulated securities
    - these US firms have long trading histories
- the US equity beta estimates used by the AER in the WACC review are unreliable, because changing aspects of the analysis leads to a higher equity beta[154]
- there are conceptual and empirical grounds to establish a relationship between US equity betas and equity betas in Australia[155]
    - with one exception, differences between US and Australia have not been quantified, so the a priori position is that US equity betas will equate to Australian equity betas
    - the exception is that international differences in the regulatory framework mean that US regulated utilities will have lower exposure to systematic risk than Australian regulated utilities

On this basis, CEG concluded that the US equity beta estimates of 'around one' should be used by the AER.[156]

The AER considers that the key issue here is whether or not there are reasonable grounds to establish a relationship between Australian and US equity beta estimates.

In the WACC review the AER noted the difference in the regulation of businesses, the regulation of the domestic economy, geography, business cycles, weather and a number of different factors are likely to result in differences between equity beta estimates for similar businesses between countries.[157] It is difficult to assign quantitative impacts to each of these qualitative factors and as such the use of

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153 CEG, *WACC estimation*, March 2011, pp. 1, 16–21, 25–27.
154 CEG, *WACC estimation*, March 2011, pp. 12–15.
155 CEG, *WACC estimation*, March 2011, pp. 21–25.
156 CEG, *WACC estimation*, March 2011, pp. 2, 27.
157 AER, *Final decision, WACC review*, May 2009, pp. 261–264.

Australian securities data for equity beta estimation seeks to encompass all of the factors within the CAPM framework in a first-best approach. For this reason and consistent with the WACC review, the AER considers foreign estimates of equity beta should only be used as a cross-check of domestic equity beta estimates.

The AER considers that the CEG report does not comprehensively evaluate the differences between Australia and the US. CEG focussed on just one aspect of the regulatory framework—the form of revenue control. It did not consider the numerous other aspects of the regulatory framework that affect the exposure of the firm to systematic risk, and which differ substantially on an international basis:

- Avenues for price adjustments outside of the main revenue control form—In the Australian context, this includes the provision for pass throughs that allows for increase to revenues in response to major market events. These directly reduce exposure to systematic risk, since the service provider is able to recover the impact of any adverse market wide event.

- Timing of regulatory reviews—A longer period between regulatory assessments increases exposure to systematic risk, since there is more time for the firm to accrue benefit/incur detriment from market-wide movements before the regulator resets the revenue. In the Australian context, regulatory arrangements are generally for five years, and there is opportunity to reopen an access arrangement early, which further reduces systematic risk.

- Approach to inflation adjustment—In the Australian context, there is an annual indexation to prices (and capital base) for inflation that almost eliminates exposure to interest rate risk, which is a factor in overall systematic risk.[158]

There are also significant international differences on a range of broad framework questions, such as the availability and scope of appeals, the burden of proof on the regulator and the relative service standards that apply.[159] These have direct relevance to the profitability of the regulated firm and secondary impacts on exposure to systematic risk.

It is difficult to quantify the impact of these qualitative factors or undertake a conceptual evaluation of the overall impact on equity beta. Neither CEG nor the AER has attempted to undertake the analysis that captures the completeness of the factors, the interaction of the factors with each other, and the overall impacts of the factors to gauge whether foreign equity beta estimates overestimate, underestimate or equate to domestic equity betas. The onus to establish such a relationship rests on those who wish to use the US data instead of the Australian data.

Accordingly, the AER considers that that there are no reasonable grounds to conclude that the US equity betas should be equivalent to Australian equity betas, or that the US equity betas should be below Australian equity betas. Rather, the AER considers

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[158] The residual inflation risk relates to the timing of the indexation (once a year) and the possible mis-specification of the proxy (CPI) for true inflation.

[159] IPART, *Changes in regulated electricity retail prices from 1 July 2011, Draft report*, April 2011, pp. 82–84.

that this lack of evidence strongly supports the use of a domestic equity beta, which means that these (potentially unresolved) issues are avoided.

CEG appears to misinterpret the position of the New Zealand Commerce Commission's (NZCC) expert advisors when it stated that 'Professor Franks argues that the US regulatory regime is lower risk relative to 5 year regulatory regimes such as in Australia'.[160] In context, this expert advice to the NZCC focuses on the fact that the use of foreign proxies in a domestic CAPM introduces an additional source of error, relative to using domestic estimates directly.[161] Fundamentally, such a position goes against CEG's suggestion that US equity beta estimates should be used instead of Australian equity beta estimates.

It may be the case that Dr Lally, another of the NZCC expert advisers, considers the US equity betas to be an underestimate of the NZ equity betas.[162] However, it appears that Professor Franks takes the opposite view. The paper by Boyle et al. that Professor Franks endorses explicitly refutes the Alexander et al. claim that the US has a 'lower risk' regulatory regime. After consideration of the evidence, this position is then adopted by the NZCC, which stated:

> Dr Lally's approach [making an upward adjustment to US asset beta estimates] was criticised by Boyle, Evans and Guthrie, (Boyle et al.) who indicated that:
>
> - the sample of US electricity utilities operated other services as well as regulated electricity services;
> - the structure of the US electricity industry had changed and that many state regulators had adopted incentive regulation;
> - Lally's claim that US electricity utilities are subject to rate-of-return regulation with annual resetting of prices was a gross over-simplification and ignored the incentive regulation implemented in many states; and
> - it was incorrect that rate-of-return regulated firms are reviewed annually.[163]

The final reasons paper from the NZCC reviews a number of other academic papers on the differences between regulatory regimes in the allocation of systematic risk. These include Buckland and Fraser, and Joskow, Kwoka and Pfeifenberger.[164] The

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160 CEG, *WACC estimation*, March 2011, p. 22 (paragraph 75). Quote is from Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, December 2008, p. 33 (paragraph 140).

161 Franks, J., M. Lally and S. Myers, *Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology*, December 2008, p. 33 (paragraphs 138–140).

162 It was on Dr Lally's advice that the NZCC increased the observed US asset beta by 0.1 to obtain an asset beta for an electricity distribution company in NZ. New Zealand Commerce Commission, *Input methodologies (Electricity distribution and gas pipeline services), Reasons paper, Final decision*, December 2010, p. 532 (paragraph H8.11) and pp. 533–534.

163 NZCC, *Input methodologies (Electricity Distribution Servicest), Draft Reasons Paper*, June 2010, p.291–293. Source papers are Boyle, G., L. Evens, and G. Guthrie, *Estimating the WACC in a Regulatory Setting*, New Zealand Institute for the Study of Competition and Regulation, March 2006 and I. Alexander, C. Mayer, and H. Weeds, *Regulatory Structure and Risk: An International Comparison*, Policy Research Working Paper 1698, The World Bank, December 1996.

164 Buckland, R., and P. Fraser, 'Political and Regulatory Risk: Beta Sensitivity in U.K. Electricity Distribution', *Journal of Regulatory Economics*, 2001, vol. 19(1), pp. 5-25; Joskow, P., *Incentive Regulation in Theory and Practice: Electricity Distribution and Transmission Networks, A Paper*

NZCC concluded that there are strong theoretical grounds that the regulatory regime can influence the level of systematic risk. However, there are no theoretical grounds to conclude that such a difference exists between the US and NZ (or Australia). Real world regulatory regimes are far more complicated than that acknowledged in the CEG analysis. There is no distinct difference between the 'low powered' regulatory regime in the US and the 'high powered' regime in the UK, and certainly no a priori expectation about where Australia sits on this spectrum.

It is somewhat of a mis-statement to say that the NZCC ceased to make this upward adjustment on the basis that 'it could not find reliable empirical evidence that differences in regulatory regimes affected the equity beta of regulated businesses.' The NZCC observed the (stable and robust) finding that the US equity betas are above those in NZ and Australia.

The NZCC's decision cited by CEG estimated the average US asset beta (0.29) to be above the midpoint for Australian asset betas (0.24) and New Zealand asset betas (0.23).

This is also confirmed elsewhere. The Victorian Essential Services Commission's decision cited by CEG estimated the Australian equity beta at between 0.5 and 0.7, with the US equity beta between 0.6 and 0.8.[165] That is, the empirical result was that equity betas in the US were above those in Australia.

The AER considers that the sensitivity analysis of equity beta estimates from US regulated firms does not lead to the conclusion that the AER's Australian equity beta estimates should not be used. The AER acknowledges that estimates of equity beta may be affected by altering the estimation period, end of estimation period, sampling period (i.e. monthly vs. weekly or daily returns), or firms included within the sample.[166] The analysis conducted by CEG is on US data and the evident variability suggests that there is no advantage relative to using Australian data. Further, the AER considers that the CEG analysis makes arbitrary adjustments (such as omitting monthly estimates) and fails to report statistical tests of its results.

An alternative comparison of international differences in equity betas for regulated network utilities was commissioned by the Office of the Gas and Electricity Markets (Ofgem) in 2009. PricewaterhouseCoopers analysed 24 comparable companies in the UK, US, Spain, Italy, Canada and Australia. The relevant set of close comparators is presented in table A.3.

Prepared for the National Bureau of Economic Research Conference on Economic Regulation, 9-10 September, 2005; Kwoka, J., *Investment Adequacy Under Incentive Regulation, Northwestern University Working Paper*, September 2009; and Pfeifenberger, J., *Incentive Regulation: Introduction and Context*, Presentation at AUC PBR Workshop, Edmonton , Alberta, May 26-27, 2010.

[165] Essential Services Commission, *Gas access arrangement review 2008–2012, Final decision*, 7 March 2008, p. 476.

[166] CEG, *WACC estimation*, March 2011, pp. 12–20.

Table A.3 International equity betas from PwC analysis for Ofgem

Company	Country	Sector	Dec 2007	Sept 2008
AGL Resources	USA	ED +VI	0.35	0.20
Enagas	Spain	GT	0.58	1.18
First Energy	USA	ED ET +VI	0.35	0.25
National Grid	UK	ED ET GD GT	0.45	0.98
New Jersey Resources	USA	GD GT	0.83	0.88
Northwest Natural Gas	USA	GD GT	0.88	1.10
Piedmont Natural Gas	USA	GD GT	0.68	0.83
Red Electrica	Spain	ET	0.45	0.93
Scottish and Southern	UK	ED ET +VI	0.58	1.28
Snam Rete Gas	Italy	GT	0.43	0.60
Transcanada	Canada	GD GT +VI	0.45	0.18
Unisource Energy	USA	ED ET GD GT	0.10	0.68
WGL Holdings	USA	GD GT	1.03	1.08
Range			**0.10 – 1.03**	**0.18 – 1.28**
Average			**0.55**	**0.78**

Source: PricewaterhouseCoopers, *Office of the Gas and Electricity Markets, Advice on the cost of capital analysis for DPCR5, Final Report*, 1 December 2009, pp. 37–45 (figures 13, 16–19); AER analysis.

Notes: Sector codes are electricity distribution (ED), electricity transmission (ET), gas distribution (GD), gas transmission (GT), vertically integrated entity operating in electricity generation and/or retail (+VI). Asset betas have been re-levered to 60 per cent using the Brealey and Myers formula and assuming a debt beta of zero. The entities shown here are the final comparator sets used by PwC, excluding Australian companies and water/sewerage companies, after adjustment for vertical integration (0.1 asset beta).

As is evident from table A.3, the average equity beta for the five years to December 2007 was 0.55, and the average for the five years to September 2008 was 0.78.

CEG has stated that since there is higher volatility in the US share market than the Australian share market, there is a statistical basis to conclude that US equity betas are higher than Australian equity betas.[167] The AER considers that this statement appears to confuse volatility with covariance, when the two are different statistical concepts. Such an assertion implies that it would be appropriate to calculate the beta of a US regulated utility using an Australian equity market index (or vice versa). Even if such analysis were conceptually valid (which it is not), there are no statistical

[167] CEG, *WACC estimation*, March 2011, p. 24 (paragraphs 79–80).

grounds to presume that the US regulated utility would have a higher equity beta if measured against the Australian index.

Based on the evidence before it, the AER considers there is no reasonable basis to conclude that US data should be used in place of Australian data, or that US equity beta estimates would better compensate Australian regulated utilities. This is consistent with the AER's draft decision and the 2009 WACC review.

A.3.2 Evidence of a 'low beta bias' in returns relative to that predicted by the CAPM

The claims in Envestra's revised proposal of a 'low beta bias' based on the reports submitted by CEG and Professor Grundy have been considered by the AER in the context of assessing the cost of equity models in section A.2. The AER considers that there is no reasonable basis to conclude that the standard CAPM implemented by the AER results in a bias. The empirical finding of 'low beta bias' plausibly arises from the flaws in the type of testing employed, rather than any deficiency in the CAPM.

A.3.3 Conclusion

The AER considers that the empirical evidence presented in the WACC review contains the best available estimate of the equity beta that would apply to a gas distribution network service provider, taking into account the need to reflect prevailing market conditions and the risks involved in providing reference services.[168] The sample set of data used to derive the equity beta in the WACC review provides a value for an equity beta of between 0.4 and 0.7.

The AER has given consideration to other factors, such as the need to achieve an outcome that is consistent with the NGO—in particular, the need for efficient investment in natural gas services for the long-term interests of consumers of natural gas. The AER has also taken into account the revenue and pricing principles, the importance of regulatory stability and is also mindful it has recently considered an equity beta of 0.8 to be appropriate, if not overstated, for other gas businesses. On the basis of the information presented, the AER concludes that an equity beta of 0.8 provides Envestra with an opportunity to recover at least its efficient costs incurred in providing reference services and meeting regulatory requirements.[169]

A.4 Market risk premium

This section sets out the AER's consideration of matters raised in the revised proposal regarding the AER's approach to determine the MRP in the draft decision.

A.4.1 The notional time horizon for the MRP

The AER has determined that the CAPM should be used to estimate the cost of equity (the required return on equity) within the WACC. The CAPM is defined as:

$$\text{Return on equity} = r_f + \beta_e \times [E(r_m) - r_f]$$

[168] NGR, r. 74(2)(b) and r. 87(1).
[169] NGL, s. 24(2).

$$= r_f + \beta_e \times MRP$$

The MRP is the expected return on the market portfolio,[170] $E(r_m)$, minus the risk free rate, r_f. Within the CAPM the risk free rate appears twice, as the return on the risk free asset and within the calculation of the market risk premium. The AER has accepted the use of the yield on 10 year Commonwealth Government Securities (CGS) as the proxy for the risk free rate. To maintain consistency within the CAPM, the MRP should also be estimated using the yield on 10 year CGS as the proxy for the risk free rate.[171]

VAA stated that it is necessary for the MRP be estimated using the same risk free rate (i.e. the yield on 10-year CGS) across the entire CAPM equation. However, it stated that the outcome is not necessarily an MRP that is relevant for a 10 year horizon. VAA noted that the MRP calculated using the yield on the 10 year CGS as the proxy for the risk free rate is used for investments of various lengths, but that most asset investment decisions under regulatory regimes are long-term.[172]

The AER agrees with VAA that the investment horizon for most regulated assets is long-term. Although the CAPM can be used to provide annual rates of return, the CAPM is a one period model. In theory it provides an estimate of the required rate of return for a single investment with a particular investment horizon.[173] The investment horizons for regulated assets owned and operated by energy network businesses vary both between assets and across businesses. However, because the AER has accepted the use of the yield on 10 year CGS as the proxy for the risk free rate parameter in the CAPM, the AER considers it appropriate to calculate the MRP with the assumption of a 10 year investment horizon. This is consistent with an earlier report from VAA. In that report, VAA stated that insofar as the yield on a 10 year CGS is used as the proxy for the risk free rate, this implies a 10 year planning horizon.[174]

Historical excess return estimates

The MRP represents investors' expectations of the future. Realised excess stock market returns are likely to inform investors' expectations of the future. However, the AER considers that investors' expectations and their required MRP are unlikely to be solely informed by past excess returns. The AER considers that investors' expectations are likely to be informed by a range of factors including current market conditions and the economic and financial markets outlook. In estimating the MRP, the AER is attempting to estimate investors' expectations of what the MRP will be in the future and not simply estimating the excess stock market returns that have been achieved in the past.

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170 The market portfolio is the diversified portfolio of all assets in the economy. The expected return on the market portfolio represents the return across all assets in the market.

171 The Australian Competition Tribunal has also noted the importance of consistency between the term of the risk free rate and the MRP. Australian Competition Tribunal, *Application by GasNet Australia (Operations) Pty Ltd [2003] ACompT 6*, p. 24.

172 VAA, *Comments on market risk premium in draft decision by AER for Envestra February 2011*, March 2011, pp. 6–7 (VAA, *Comments on market risk premium*, March 2011).

173 This is supported by the report from SFG, which noted that the CAPM is a one-period model that is silent on the length of the period. See SFG, *Issues affecting the estimation of MRP*, 21 March 2011, pp. 17–18.

174 VAA, *Market risk premium, a review paper*, August 2008, p. 8.

In the draft decision, the AER considered estimates of historical excess returns for three different periods of differing length and data quality as calculated by Associate Professor Handley. These estimates were adjusted to incorporate a value for the imputation credit utilisation rate (theta) of 0.65, consistent with the theta estimate used to estimate the cost of corporate income tax in the draft decision. For this final decision the AER has departed from the draft decision and adopted a theta estimate of 0.35. This is discussed in chapter 6. The latest historical excess return estimates, adjusted to incorporate a value for theta of 0.35 are outlined in table A.4.

Table A.4 Historical excess return estimates means—assuming an imputation credit utilisation rate of 0.35 (per cent)

Period	Historical excess returns (geometric means)	Historical excess returns (arithmetic means)
1883–2010	4.8	6.2
1937–2010	3.9	5.9
1958–2010	3.8	6.4

Source: Handley, *Memorandum: Additional Estimates of the Historical Equity Risk Premium for the Period 1883 to 2010*, 25 May 2011, p. 1.

Periods used to estimate historical excess returns

As noted in the draft decision, the AER has chosen to consider the periods outlined above for the following reasons:

- The period 1883 to 2010 provides a large sample, which incorporates many years of excess returns data as well as large negative and positive market events. However, for the period up to 1937 there is a relatively small sample of stocks available and includes periods of government stock price controls.[175]

- The period 1937 to 2010 provides a slightly smaller number of observations than the 1883 to 2010 period, but it incorporates a consistently larger sample of stocks and avoids the problems associated with data prior to 1937.

- The two periods above both incorporate data from the Lamberton data series up to 1958, which is likely to overstate historical excess returns prior to 1958. The Lamberton data series uses an equal weighted rather than value weighted average of stock returns, which results in a bias towards high yielding small stocks. In addition to this, the Lamberton data series comprises dividend paying stocks only, which results in an overstatement of the market average. This is because not all stocks pay dividends. In estimating historical excess returns, Brailsford et. al. considered 1958 to be a critical break in the sample period that reflected a shift from poor to relatively good quality data.[176] Brailsford et. al. sourced data from

[175] Brailsford, Handley and Maheswaran, 'Re-examination of the historical equity risk premium in Australia', *Accounting and Finance*, vol. 48, 2008, pp. 78–79.

[176] This is the date from which the SSE began calculation of the Sydney All Ordinary Index and data after 1958 did not rely exclusively on the unadjusted Lamberton data series. Brailsford et. al. also note that they use data for 1883-1979 sourced from the ASX, which was adjusted to account for

the ASX, which adjusted the pre-1958 data to account for the likely overstatement of equity returns in the Lamberton data series. This data was also used by Handley in his latest estimates of historical excess returns.

- The period 1958 to 2010 provides a smaller number of observations, but it avoids the issues associated with data prior to 1958.

VAA submitted that the MRP estimated for the period 1883–2010 and assuming a theta value of 0.35, is 7.6 per cent. It also provided a graph of progressive long-term estimates from 1883–2010.[177] However, this analysis appears to be based on data prior to 1958 that is not adjusted for the likely overstatement of historical excess returns that was identified by Brailsford et. al. This is inconsistent with VAA's prior estimates, which used pre-1958 data that incorporated adjustments identified by Brailsford et. al.[178] VAA does not explain why it departed from its previous approach and the AER is unaware of any evidence to suggest that the Brailsford et. al. analysis was incorrect. As a result, the AER does not consider it reasonable to adopt VAA's analysis for historical excess return estimates from 1883 onwards.

VAA also submitted that, if the excess return observation for 2008 were given a one in 128 year weight within the historical excess return estimate for the 1958–2010 period, its estimate would increase from 6.4 to 7.2 per cent. VAA submitted that there was a stock market excess return of approximately –47 per cent in 2008. However, VAA did not actually advocate using its 7.2 per cent estimate (which gives the excess return observation for 2008 a one in 128 year weight) for the 1958–2010 period. VAA simply noted that using a longer time series better reflects the likelihood of events such as the GFC occurring.[179]

The AER has considered estimates of the MRP for longer periods, including 1883–2010 and 1937–2010. Although the excess return observation for 2008 was –47 per cent, the excess return observation for 2009 was approximately 35 per cent.[180] Further, as illustrated in figure A.2, individual excess return observations range from between –47 per cent to over 50 per cent. Therefore, it does not seem reasonable to make a one-off adjustment to the observation for 2008 in any of the periods considered.

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overstatement due to the exclusion of dividend paying stocks and by equal weighting of stocks over some periods in the data sample. Brailsford, Handley and Maheswaran, 'Re-examination of the historical equity risk premium in Australia', *Accounting and Finance*, 48, 2008, pp. 73–97.

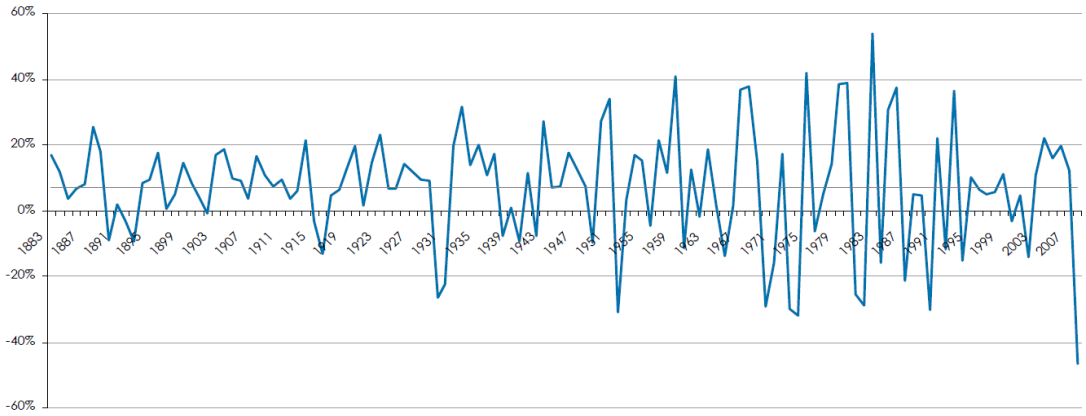
177 VAA, *Market risk premium update, prepared for Envestra*, April 2011.

178 See VAA, *Comments on the AER draft distribution determination for Victorian electricity distribution network service providers*, July 2010, p. 21.

179 VAA, *Market risk premium update, prepared for Envestra*, April 2011.

180 Handley, *Memorandum: Additional Estimates of the Historical Equity Risk Premium for the Period 1883 to 2010*, 25 May 2011, p. 1 (Handley, *Memorandum: Equity Risk Premium 1883 to 2010*, May 2011).

Figure A.2 Realised excess market return observations



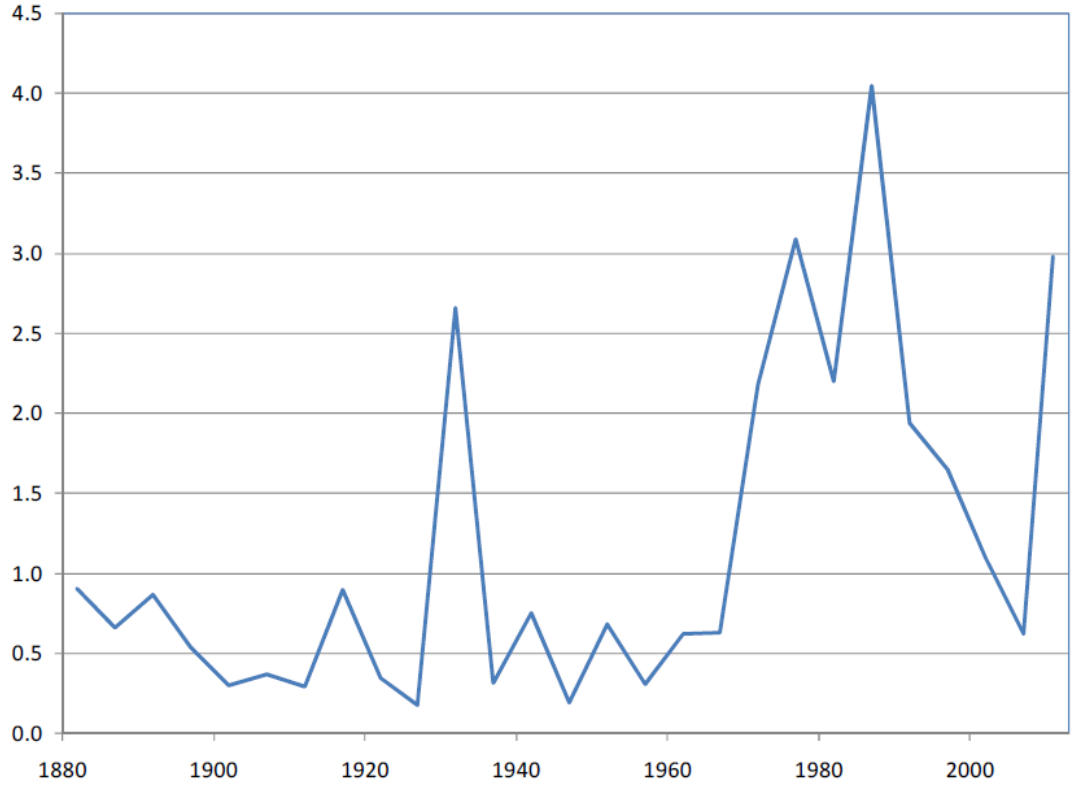
Source: Officer and Bishop, *Market risk premium, further comments*, January 2009, p. 4.

NERA suggested that historical evidence indicates that the Australian market portfolio was substantially less risky in the latter part of the 19th century, and the earlier part of the 20th century, than the latter part of the 20th century and the beginning of the 21st century.[181] NERA analysed stock market variance and stock market volatility over progressive 5 year periods from 1883 to 2011 and concluded that there is statistically significantly greater volatility in the post-1958 period than the pre-1958 period. NERA suggested that one way to take this into account would be to use post-1958 data only, which it stated would tend to support an MRP estimate of 6.5 per cent.[182] The AER considers that NERA's analysis simply shows that there have been periods of high and low stock market variance and volatility over time, which can be seen from figure A.3.

[181] NERA, *The market risk premium, a paper for Multinet and SP AusNet*, 29 April 2011, p. 2 (NERA, *Market risk premium*, April 2011).

[182] NERA, *Market risk premium*, April 2011, pp. 3–8.

Figure A.3 Stock market variance by half decade as estimated by NERA



Source: NERA, *The market risk premium, A report for Multinet Gas and SP AusNet*, 29 April 2011.

The AER has considered the period 1958 onwards based on the analysis by Brailsford et. al., which suggested that the post-1958 period contains the highest data quality. However, the data used to estimate historical excess returns is actually different to the data used by NERA to estimate stock market variance and volatility (which does not incorporate dividend yield data).[183] As a result it does not seem appropriate for NERA to segment this different dataset at 1958. If NERA's data was segmented at 1958 on an economically justifiable basis,[184] its analysis may be relevant. However, NERA did not posit any economic reasons why volatility would be greater after 1958 in particular.[185] Rather NERA's analysis simply chose the year 1958 to segment the data because it was the latest sub-period used by the AER when estimating historical excess returns. As outlined above, the AER has considered the three different time periods of 1883–2010, 1937–2010 and 1958–2010 because each time period has its own benefits and draw-backs. For example the period 1883–2010 is the longest period and also has the smallest confidence interval (3.3 – 9.1 per cent), but is affected by

[183] NERA's data does not incorporate dividend yield data, nor is it clear if it incorporates adjustments to pre-1958 data noted by Brailsford et. al., which is discussed above.

[184] For example, if there was some fundamental change in the stock market in 1958.

[185] NERA did not provide analysis of the statistical properties of its dataset, as distinct from other datasets.

data quality concerns. The period 1958–2010 is shorter, but it corresponds to a period of higher quality data and has the widest confidence interval (0.2 – 12.7 per cent).[186]

Variability of excess returns and the method of averaging

SFG stated that historical excess return estimates have very wide confidence intervals[187] and an estimate of 6.5 per cent could not be rejected on statistical grounds.[188] The AER acknowledges that the estimated averages of historical excess returns (calculated on an arithmetic basis) have wide confidence intervals and neither 6.5 nor 6 per cent can be rejected on statistical grounds.[189] However, this is partly because annual stock market returns by their nature vary significantly between positive and negative values, which contribute to wide confidence intervals around mean excess return estimates (see figure A.2 above). Although there are wide confidence intervals around excess return estimates, the point estimates calculated on both an arithmetic and a geometric mean basis[190] are still relevant and should inform the best estimate of the MRP.

SFG noted that the CAPM can be applied assuming a one year investment horizon or a 10 year investment horizon, but that estimating excess returns for non-overlapping 10 year periods is precluded by the available data.[191] For the reasons outlined above, the AER considers that an assumption of a 10 year time horizon is appropriate to maintain consistency with the term of the risk free rate proxy used in the CAPM. As noted in the draft decision, the AER recognises that it is difficult to estimate excess returns over a 10 year time horizon due to the limited availability of data.[192] However, arithmetic mean estimates of realised annual excess returns are likely to overstate realised excess returns over a 10 year time horizon because they do not take account of the cumulative effect of returns over a 10 year time horizon.[193]

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186 The confidence intervals are reported by Handley as 95 per cent confidence intervals. Handley, *Memorandum: Equity Risk Premium 1883 to 2010*, May 2011, p. 1.

187 Confidence intervals take account of variability of observations in a set of data away from the average and provide statistical bounds on the likely true value for an estimated value based on the particular data set.

188 SFG, *Issues affecting the estimation of MRP*, 21 March 2011, pp. 13–14.

189 Specifically, based on the data neither 6 per cent, nor 6.5 per cent can be rejected as the true value for the mean of excess returns within the 95 per cent confidence intervals reported by Handley. This confidence interval assumes a normal probability distribution. For example, the 95 per cent confidence interval for the annual historical excess return estimate for 1958–2010(calculated as an arithmetic mean) is 0.2 – 12.7 per cent. Handley, *Memorandum: Equity Risk Premium 1883 to 2010*, May 2011, p. 1

190 An arithmetic mean simply sums all return observations and divides by the number of observations. A geometric mean multiplies a return observation by one plus the next years return cumulatively across the period, and then takes the nth root of the cumulative product of returns where n is the number of observations. See AER, *Draft decision*, February 2011, pp. 258–260.

191 SFG, *Issues affecting the estimation of MRP*, 21 March 2011, pp. 17–18.

192 AER, *Draft decision*, February 2011, p. 259.

193 The cumulative return across a 10 year period will be less than the average of yearly returns because a negative return in later years will reduce the value of gains in previous years as well as the value of the initial portfolio. This is not reflected in arithmetic means of yearly returns. The geometric mean across the entire time periods considered by the AER are significantly less than the arithmetic means across the same period, which reflects the cumulative effect of negative returns on the previous years' returns.

SFG noted that using a geometric mean for the period 1883–2008 is equivalent to assuming a 128 year investment horizon.[194] The AER acknowledges that geometric averages estimate a cumulative return over the relevant sample period, which would be 53, 74 and 128 years for the different sample periods considered by the AER. However, in the draft decision the AER did not propose to adopt a geometric mean estimate as the best estimate of the MRP and it has not decided to do so in this final decision. Consistent with the draft decision the AER notes that the arithmetic means of historical excess returns are likely to be overstated to some degree. The best estimate of historical excess returns over a 10 year period is likely to be somewhere between the geometric mean and the arithmetic mean of annual excess returns. The imprecise nature of historical excess returns estimates, as well as other indicators of the expected MRP, means a significant degree of judgment is required when interpreting the available evidence to inform the best estimate of the expected MRP.

The consideration of imputation credits in historical excess returns

SFG submitted that changes in the assumed value for the imputation credit utilisation rate (theta) only have a minor impact on historical estimates of the MRP. It submitted that, by itself, a change in theta would not justify departing from an MRP of 6.5 per cent to 6 per cent.[195] SFG also stated that changing the sample periods over which the MRP is calculated has a more significant impact than changing the assumed value of theta on historical estimates of excess returns.[196]

The AER acknowledges that, by itself, a change in theta would not justify departing from an MRP of 6.5 per cent to 6 per cent. It recognises that the estimation of the MRP is imprecise and requires consideration of a range of evidence. The AER also notes that it was primarily the uncertainty arising from the impact of the GFC at the time of the WACC review that prompted it to depart from previous regulatory practice and increase the MRP from 6 per cent to 6.5 per cent.[197] It was not the assumed value of theta that prompted the AER to increase the MRP from 6 per cent to 6.5 per cent.

The AER has considered estimates of historical excess returns that have been explicitly 'grossed-up' for an assumed value of theta of 0.35. That is, the historical excess return estimates considered by the AER were first estimated using data on dividends and capital gains from accumulation indices, and observations of yields on 10 year CGS. These estimates were then adjusted for an assumed theta value.[198] It would be internally inconsistent within the building blocks framework to consider historical excess return estimates that have been adjusted for an assumed value of theta different from that adopted by the AER to estimate the cost of corporate income tax.

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194 SFG, *Issues affecting the estimation of MRP*, 21 March 2011, pp. 17–18.
195 SFG, *Issues affecting the estimation of MRP*, 21 March 2011, pp. 5–7.
196 SFG, *Issues affecting the estimation of MRP*, 21 March 2011, pp. 5–7. As noted in the draft decision the sample periods used for estimating historical excess returns were chosen based on data quality considerations, not to intentionally bias estimates of historical excess returns as was suggested by SFG. See AER, *Draft decision*, February 2011, pp. 257–258.
197 AER, *Final decision, WACC review*, May 2009, p. 238.
198 Handley, *An Estimate of the Historical Equity Risk Premium for the Period 1883 to 2010*, 25 January 2011, pp. 3–4.

At the time of the draft decision, the AER determined that the best estimate of theta was 0.65. It therefore considered historical excess return estimates that were explicitly grossed-up using an assumed value of theta of 0.65. In this final decision, the AER has adopted a theta estimate of 0.35. Therefore it has considered historical estimates of excess market returns that have been grossed-up for a theta estimate of 0.35. Historical excess return estimates grossed-up for a theta estimate of 0.35 over different periods and calculated as arithmetic means are 5.9–6.4 per cent.

Due to the imprecise nature of historical excess return estimates as outlined above, it may be inappropriate to adjust estimates when the assumed value of theta is very small. However, consistent with the draft decision[199] and previous regulatory practice[200], the AER has taken a conservative approach and considered estimates that have been explicitly grossed-up to take into account the value of distributed imputation credits.[201]

VAA statement on imputation credits and the MRP

VAA stated that, in the draft decision, the AER misquoted VAA's view.[202] The AER does not consider it has misquoted the position stated in VAA's August 2008 report. In the draft decision, the AER referred to the main conclusion in the August 2008 report by VAA, which stated the following:[203]

> We recognise that precise estimation of both the MRP without imputation tax benefits and the estimation of imputation tax benefits is a challenge due to 'noise' in historical data. An overlay of the need for regulatory certainty encourages us to recommend that there be no change in the widely used 6% under a view that imputation tax benefits have no value but it this is not enough to prevent our recommendation of 7% when imputation benefits are included. While we have not focused on estimating an explicit value of gamma or the value of imputation tax credits once distributed in this paper, regulatory practice places a value on gamma of 0.3 and greater. Under these circumstances we recommend the MRP be 7%.

However, in its March 2011 report, VAA has referred to its discussion in a January 2009 report about whether regulatory decisions prior to the WACC review had regard to the value of imputation credits. The January 2009 report stated that historical estimates of the MRP considered by regulators prior to the WACC review had not been explicitly grossed-up to incorporate a specific value for imputation credits.[204]

In the WACC review explanatory statement, the AER did not dispute that the historical estimates of the MRP considered by regulators prior to the WACC review had not been explicitly grossed-up to incorporate a specific value for imputation credits. However, the AER noted that regulators had previously had regard to the

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199 AER, *Draft decision*, February 2011, pp. 75–77.

200 See for example, AER, *Final decision, Victorian electricity distribution network service providers*, October 2010, p. 488.

201 VAA, *Comments on the market risk premium*, March 2011, Appendix 1.

202 VAA, *Comments on the market risk premium*, March 2011, Appendix 1.

203 VAA, *Market risk premium, a review paper*, August 2008. Note the conclusion is outlined before the introduction section. This position was also repeated in a later report, see VAA, *Market risk premium, further comments*, January 2009, p. 1.

204 VAA, *Comments on the market risk premium*, March 2011, Appendix 1.

value of imputation credits when setting the MRP. Specifically, forward looking estimates of the MRP were explicitly grossed-up to incorporate a value for imputation credits, but that historical estimates of the MRP were not explicitly grossed-up to reflect the value of imputation credits.[205]

Furthermore, the AER considered it appropriate to gross-up historical estimates of the MRP to incorporate the assumed value of imputation credits for the excess returns following the introduction of the imputation tax system in 1987. This was noted in the WACC review final decision.[206]

A.4.2 DGM based estimates of the MRP

As discussed below, DGM based estimates of the return on equity and inferred estimates of the MRP are highly sensitive to the assumptions made. It is necessary that all assumptions made have a sound basis, otherwise estimated results from DGM analysis may be inaccurate and lead analysts into error.[207] The AER considers that DGM based analysis should not be used as the principal basis for estimating the return on equity, and at best can be used as a check on the reasonableness of the estimated return on equity.

CEG submitted analysis, which suggested that an MRP of 7.4 per cent combined with an equity beta of 1.0 and a growth rate of zero would equate current dividend forecasts to the current share prices of six energy network businesses. However, its analysis is highly sensitive to the assumptions made. For example, CEG has grossed up its estimates for an assumed value for theta of 0.5. However, if the model was adjusted to incorporate a theta estimate of 0.35,[208] CEG's suggested estimate of the MRP (combined with an equity beta of 1) would change from 7.4 to 6.7 per cent.

CEG's analysis is also dependent on the current dividend yields (approximately 7–10 per cent) for the six energy network businesses analysed being maintained into perpetuity. However, these yields are very high compared to the market average, which was estimated to be approximately 4 per cent in April 2011.[209] If the analysis was changed to incorporate an assumed dividend yield of 4 per cent, a theta value of 0.35 and a zero growth rate across all six businesses, the MRP estimated from CEG's analysis would change from 7.4 per cent to –0.9 per cent.[210] This illustrates the high sensitivity of DGM analysis to the assumptions made.

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205 AER, *Explanatory statement, Electricity transmission and distribution network service providers, Review of the weighted average cost of capital (WACC) parameters*, December 2008, pp. 144–146 (AER, *Explanatory statement, WACC review*, December 2008).

206 See AER, *Explanatory statement, WACC review*, December 2008, pp. 161–166; AER, *Final decision, WACC review*, May 2009, p. 209.

207 For example corporate finance texts have noted "The simple constant-growth DCF [discounted cash flows] formula is an extremely useful rule of thumb" but "Naive trust in the formula has led many financial analysts to silly conclusions." Richard Brealey, Stewart Myers and Franklin Allen, *Principles of Corporate Finance: International Edition*, 9th Edition, Boston: McGraw-Hill, 2008, p.95.

208 The value of theta of 0.35 is applied by the AER for the purposes of estimating the cost of corporate income tax, which is discussed in chapter 6.

209 This is based on the MSCI Australia index. See RBA statistical tables, Table F.7 – share market, available at http://www.rba.gov.au/statistics/tables/pdf/f07.pdf, viewed 13 May 2011.

210 This is based on AER analysis using CEG's DGM analysis.

The basis for the AER's beta estimate of 0.8 is outlined in chapter 5. To separately estimate the MRP using DGM analysis, dividend yields and growth forecasts would need to be estimated for the market as a whole.[211] The MRP estimated using CEG's DGM analysis and adjusted to incorporate market wide assumptions is approximately 4.5–5.6 per cent over a notional 10 year horizon.[212] This estimate is based on the following assumptions:

- a theta value of 0.35, consistent with the value applied in estimating the cost of corporate income tax in this decision
- a dividend yield of approximately 4–5 per cent, consistent with average dividend yields on the ASX 200 index[213]
- an assumed dividend growth rate of 6 per cent, consistent with long-term GDP growth estimates from the RBA of approximately 3.5 per cent [214] and an assumed inflation rate of approximately 2.5 per cent, consistent with long-term inflation forecasts.

Table A.5 MRP estimates with different growth assumptions

Growth rate	Theta value	Dividend yield	Estimated MRP
0%	0.35	4 – 5 %	–0.9 – 0.4 %
3.5%	0.35	4 – 5 %	2.3 – 3.4 %
6.0%	0.35	4 – 5 %	4.5 – 5.6 %

Source: AER analysis.

Table A.5 illustrates that forward looking MRP estimates based on DGM analysis are significantly lower than Envestra's proposed MRP range of 6.5–8 per cent.

SP AusNet and Multinet also provided a submission that attached a report from Capital Research (CR). CR conducted its own DGM analysis to estimate an implied MRP. CR submitted that a reasonable range for the MRP is 6.6–7.5 per cent. In estimating this range, CR assumed a long-term dividend growth rate of 8.12 per cent, dividend yield forecasts in the range 2.5–6.5 per cent, and a theta value of between 0 and 0.5. As outlined above, the AER notes that DGM analysis is very sensitive to the

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[211] This is because the MRP is a market-wide parameter and is not specific to a particular firm or industry

[212] These figures are the estimated premium in excess of the 10-year CGS yield, which implies a notional 10-year investment horizon.

[213] Average dividend yields estimated from the MSCI Australia index for 2005–2011 as reported in RBA statistical tables, Table F.7 – share market, available at http://www.rba.gov.au/statistics/tables/pdf/f07.pdf, viewed 13 May 2011. This is also reflected in Capital Research's DGM analysis, which illustrates that most analysts' forecasts of dividend yields since 1999 have been around 4–5 per cent; see CR, *Forward estimates of market risk premium*, April 2011, p. 15. SFG has suggested that the current dividend yield of approximately 4 per cent is higher than much of the past decade; see SFG, *Issues affecting the estimation of MRP*, 21 March 2011, p. 11.

[214] RBA, *Statement on monetary policy*, May 2011, p. 63.

assumptions made. The AER has the following concerns about the dividend growth assumption made by CR in its analysis:

- The assumed growth rate of 8.12 per cent appears to be based on analysts' estimates of the long-term growth in earnings per share (8.18 per cent). CR noted that analysts' estimates of long-term growth typically translate to a period of 3–5 years. However, the DGM assumes growth at a constant rate in perpetuity. Logically, growth in dividends paid by the market portfolio cannot exceed economic growth because dividends comprise only part of the economy.[215]

- This growth rate also appears to be principally based on analysts' forecasts of growth in earnings per share, not growth in dividends per share. CR inferred an estimate of the growth in dividends per share of 8.91 per cent based on analysts' 12-month forecasts of dividends per share and how they change over time. However, this may not necessarily reflect analysts' actual estimates of growth in dividends per share across the market, which is what is required when estimating the MRP using DGM analysis.

- If the assumed growth rate was more consistent with long-term economic growth forecasts of around 3.5 per cent and an inflation rate of 2.5 per cent as noted above, the MRP estimated through CR's method would be less than the estimated range of 6.6–7.5 per cent.[216]

CR's assumed growth rate of 8.12 per cent also varies significantly from CEG's assumed growth rate of –3.5 to 5.5 per cent. The sensitivity of results when using varied assumptions in DGM analysis highlights the need for the assumptions used in DGM analysis to have a sound basis.

A.4.3 Implied volatility from option prices

VAA stated that it estimated a forward view of the MRP over time.[217] The AER accepts that the MRP is a forward looking value and that it is likely to revert to a mean value over time. However, the AER does not consider that VAA's implied volatility and 'glide path' approach provides the best estimate of a long-term MRP for the purposes of this decision. In the draft decision the AER outlined its concerns about the use of a constant market risk per unit of implied volatility from option prices in providing a one year MRP estimate.[218]

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[215] If the perpetual dividend growth rate was greater than economic growth, dividend payments would eventually exceed the size of the economy, which is impossible. See Lally, The cost of capital under dividend imputation, report prepared for the ACCC, June 2002, p. 31. See also Richard Brealey, Stewart Myers and Franklin Allen, *Principles of Corporate Finance: International Edition*, 9th Edition, Boston: McGraw-Hill, 2008, p.95, which states "Naive trust in the [constant growth discounted cash flow model, or DGM] formula has led many financial analysts to silly conclusions… resist the temptation to apply the formula to firms having high current rates of growth. Such growth can rarely be sustained indefinitely, but the constant-growth DCF formula assumes it can."

[216] Due to the late submission of CR's analysis, the AER has not been able to fully analyse CR's data and estimate alternative DGM based estimates with different growth assumptions.

[217] VAA, *Comments on market risk premium*, March 2011, p. 8.

[218] AER, *Draft decision*, February 2011, pp. 260–263.

In the draft decision, the AER noted that Chernov (2007) explained why at the money option implied volatility is a biased and inefficient forecast of future realised volatility.[219] In response to this, NERA noted that Chernov (2007) also stated the following:[220]

> A number of robust conclusions have emerged: ATM implied volatility is (1) informative about future volatility, (2) superior to other measures of volatility and (3) an upwards-biased predictor.

NERA also outlined two other US reports that supported the use of implied volatility as a predictor of realised volatility.[221] However, it is clear from the analysis and conclusions of Chernov (2007), as well as the two US studies cited by NERA, the relationship between implied volatility and realised volatility is not straight forward.[222] More importantly the exact relationship between volatility and the MRP is not straight forward, nor is option implied volatility commonly used to directly estimate the MRP over a long-term horizon.[223]

NERA outlined a number of academic reports from the US that provided some support for a link between the MRP and a measure of implied volatility.[224] NERA did not provide a reliable method for directly estimating the MRP over a long-term horizon using the implied volatility from option prices at a particular point in time.[225] The AER is not aware of a reliable way of directly estimating the MRP over a one year period (let alone for a 10-year time horizon) using implied volatility from option prices. In addition, figure A.4 illustrates the high variability of option implied volatility over time. As a result, the AER considers that option implied volatility is at best a qualitative indicator of the expected MRP.

VAA, SFG and NERA stated that implied volatility from option prices increased significantly at the time of the GFC. They stated that implied volatility has reduced since the height of the GFC, but currently remains above pre-GFC levels.[226] VAA previously stated that where there are abnormal levels of volatility it is appropriate to use an alternative approach (such as its suggested implied volatility and 'glide path' approach) to adopting a long-term estimate.[227] However, implied volatility appears to have reduced significantly since the height of the GFC and is currently consistent with levels experienced prior to the GFC, which can be seen from figure A.4. Figure A.4 shows the average implied volatility indicated by 3 month options since 1997, both prior to the GFC and the average across the entire period. Current levels of implied volatility are consistent with both of these averages. In this context, the AER considers that it unreasonable to accept VAA's suggested implied volatility and 'glide

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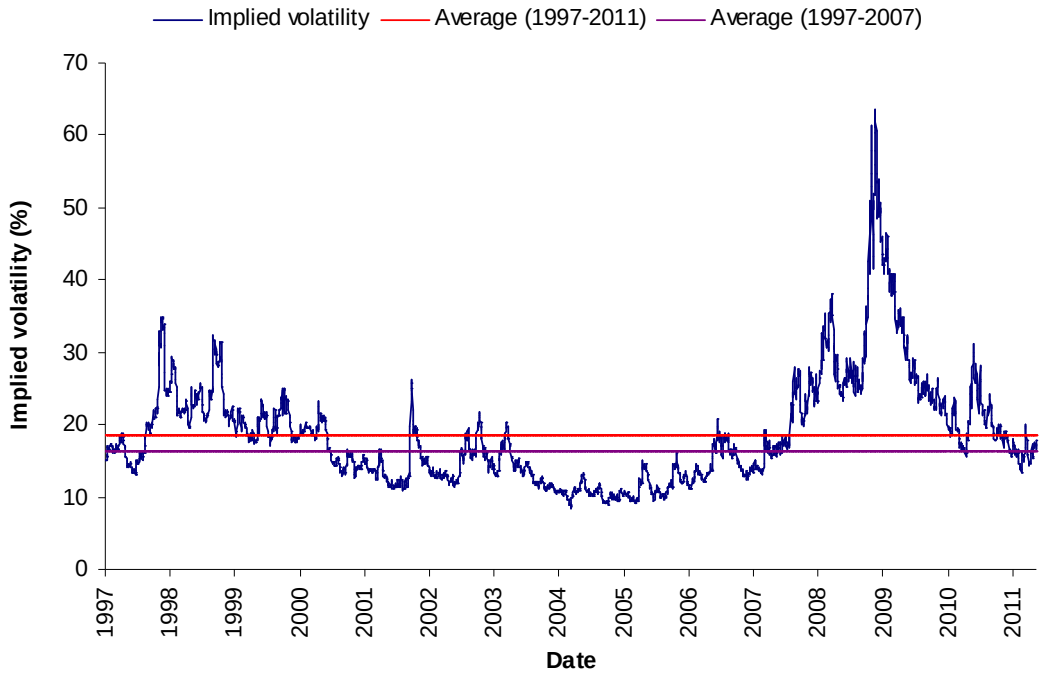
219 AER, *Draft decision*, February 2011, p. 262.
220 NERA, *Market risk premium*, April 2011, pp. 17–19.
221 NERA, *Market risk premium*, April 2011, pp. 17–19.
222 See quotes in NERA, *Market risk premium*, April 2011, pp. 17–19.
223 See quotes in NERA, *Market risk premium*, April 2011, p. 19.
224 NERA, *Market risk premium*, April 2011, p. 19.
225 NERA noted that there are prolonged swings in the implied volatility series away from its mean, but that the volatility is mean reverting. NERA, *Market risk premium*, April 2011, p. 21.
226 VAA, *Comments on market risk premium*, March 2011, pp. 4–5; SFG, *Issues affecting the estimation of MRP*, 21 March 2011, p. 10; NERA, *Market risk premium*, April 2011, p. 20.
227 VAA, *Market risk premium, estimate for January 2010–June 2014*, December 2009, p. 1.

path' approach, which was initially proposed as an alternative to long term estimates based on prevailing conditions characterised by very high levels of implied volatility.

Figure A.4 Implied volatility from prices of 3 month options on the ASX200 index



Source: AER analysis

A.4.4 Current market conditions

VAA presented a graph showing time to recovery after previous stock market crashes. It stated that the graph shows that there is still some time to pass before the market recovers to pre-GFC levels. The AER notes that VAA's graph shows that the path of recovery following previous stock market crashes varies significantly—for example, between approximately 3 and 8 years.[228] VAA has not provided a framework for assessing the time to recovery since the 2007 crash. As a result it is not possible to draw conclusions about when the market will return to pre-2007 levels.

The latest evidence provided by VAA suggests that implied volatility derived from the prices of three month and one year options on the ASX200 index appears to have significantly reduced since the height of the GFC. Furthermore, figure A.4 indicates that implied volatility has returned to pre-GFC levels.

The AER notes that recent statements from the RBA, the Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF) continue to indicate a robust economic outlook. In the May 2011 *Statement on monetary policy* the RBA stated:

> The Bank's medium-term central scenario for the economy remains similar to that discussed over the past year or so. For most of the forecast horizon, growth is expected to be at, or above, trend and the unemployment rate is

[228] VAA, *Comments on market risk premium*, March 2011, pp. 5–6.

> expected to decline gradually. Compared with three months ago, the forecasts for growth in 2012 and into 2013 have been lowered a little, largely reflecting the recent appreciation of the exchange rate. In the short term, the quarterly profile for GDP will be significantly affected by the floods; as noted above, aggregate output is likely to have declined in the March quarter, but a bounce-back is expected in the June and September quarters.[229]

In its May 2011 economic outlook summary for Australia, the OECD continued to forecast robust economic growth in Australia. The OECD stated:

> The Australian economy is set to rebound after the disruptions caused by major natural disasters in early 2011. Growth, driven by historically high terms-of-trade, should accelerate from 3% in 2011 to 4½ per cent in 2012. Unemployment is projected to fall, although the remaining slack in the economy will mute the risk of inflation pressures.[230]

In an October 2010 staff report and public information notice, the IMF stated that the economic outlook for Australia remains favourable. It forecast economic growth of 3 to 3.5 per cent over 2010 and 2011.[231]

VAA noted that there may be times where market risk is substantially below long-term estimates. VAA noted that in such a scenario it would advocate using a 'glide-path' approach to estimating an MRP that reverts to a long-term estimate. Such an approach would set an MRP below long-term estimates. In the draft decision the AER noted that forward looking estimates of the MRP have previously been lower than long-term historical excess return estimates. However, the ACCC and state regulators have consistently adopted a long-term MRP estimate of 6 per cent when this was the case.[232]

There is significant difficulty in calculating the MRP on a time varying basis. For this reason the AER considers a long-term MRP estimate is likely to provide the best estimate in the absence of a structural break.[233] At the time of the GFC, the AER increased its long-term MRP best estimate of 6 per cent to 6.5 per cent to take into account the uncertainty associated with the effects of the GFC on future market conditions. As discussed above, market conditions since the GFC have significantly improved and reflect reduced concern about the potential ongoing impact of the GFC. There is also a much more robust long-term economic and financial markets outlook for Australia than was the case at the height of the GFC.

A.4.5 Survey evidence

In the draft decision, the AER noted that survey evidence both prior to and following the GFC supported an MRP of 6 per cent. Survey evidence prior to the GFC included the following:

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229 RBA, *Statement on monetary policy*, May 2011, p. 3.

230 OECD, *Australia economic outlook 89—country summary*, May 2011, http://www.oecd.org/document/15/0,3746,en_2649_33733_45268687_1_1_1_1,00.html, viewed 7 June 2011.

231 IMF, *Australia: 2010 Article IV Consultation—Staff Report; and Public Information Notice on the Executive Board Discussion*, October 2010, p. 10. available at http://www.imf.org/external/pubs/ft/scr/2010/cr10331.pdf.

232 AER, *Draft decision*, February 2011, pp. 72–73.

233 See also AER, *Final decision, WACC review*, May 2009, pp. 190–191.

- Truong, Partington and Peat (2008) found that the MRP adopted by Australian firms in capital budgeting ranged from 3–8 per cent, with an average of 5.94 per cent. The most commonly adopted MRP was 6 per cent.

- Capital Research (2006) found that the average MRP adopted across a number of brokers was 5.09 per cent.

- KPMG (2005) found that the MRP adopted in independent expert valuation reports ranged from 6–8 per cent. KPMG's report showed that 76 per cent of survey respondents adopted an MRP of 6 per cent.[234]

The latest survey evidence, conducted following the GFC included the following:

- Fernandez (2009) found that the MRP used by Australian academics in 2008 ranged from 2–7.5 per cent with an average of 5.9 per cent.[235]

- Fernandez and Del Campo (2010) found that the MRP used by Australian analysts in 2010 ranged from 4.1–6 per cent with an average of 5.4 per cent.[236]

NERA noted some shortcomings of survey based evidence on the MRP and suggested that survey respondents may not provide serious responses. However, the AER does not consider there is any reason to suspect that survey respondents are biased or that they do not provide serious responses. As noted in the draft decision, survey results are subjective because different market practitioners may look at a range of different time horizons and they are likely to have differing views on market risk. However, survey based estimates of the MRP are forward looking, reflect actual market practice, and are unlikely to be biased.

NERA also noted that the latest surveys following the GFC are based on a limited sample of respondents and suggested that the MRP indicated by respondents are not adjusted for imputation credits. The AER recognises that the latest survey based evidence from 2009 and 2010 incorporates a limited sample of respondents. However, the AER notes that there was a significant amount of survey evidence preceding the GFC, which supported an MRP of 6 per cent. The latest survey evidence, although limited, indicates that the MRP applied by market practitioners is unlikely to have changed as a result of the GFC.

With regard to the value of imputation credits being explicitly incorporated in survey based evidence, Truong, Partington and Peat (2008) noted that in their survey 15 per cent of respondents stated their MRP was adjusted to incorporate imputation credits. They noted that the remaining 85 per cent of respondents did not adjust for imputation credits because it was either too difficult, should have a very small impact, or was unnecessary as the market already adjusts stock prices to incorporate the value of imputation credits and so this will already be reflected in the cost of capital

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234 AER, *Final decision, WACC review*, May 2009, pp. 221–225.

235 Fernandez and Del Campo, M*arket Risk Premium used by Professors in 2008: A Survey with 1400 Answers*, IESE Business School Working Paper, WP-796, May 2009, p. 7.

236 Fernandez and Del Campo, *Market Risk Premium Used in 2010 by Analysts and Companies: A Survey with 2400 Answers*, IESE Business School, 21 May 2010, p. 4.

estimate.[237] NERA suggested that an imputation adjusted MRP from Fernandez (2009) and Fernandez and Del Campo (2010) is 6.6 per cent based on an assumed theta value of 0.65.[238] The AER does not consider it appropriate to adjust the overall estimates of Fernandez and Del Campo based on one survey respondent, who noted that they were uncertain about how to interpret historical estimates with wide confidence intervals and did not outline how to adjust an MRP estimate to include value arising from imputation credits. Furthermore the estimation of MRP is imprecise and it may not be appropriate to explicitly adjust survey based estimates of the MRP for an assumed theta value that is as low as 0.35.

Due to the subjective nature of survey based estimates, uncertainty about the term over which the MRP is estimated by different respondents and the differing views of respondents about market risk, the AER has not relied exclusively on survey based estimates of the MRP. Nonetheless, survey based estimates of the MRP are relevant for consideration along with the range of other evidence on the MRP.

A.4.6 Market practice

The AER notes that the range of MRP estimates used in broker reports provided by Envestra was 5–6.5 per cent, with an average of approximately 5.9 per cent. In addition to this, recent research completed by Shane Oliver, Head of Investment Strategy and Chief Economist at AMP Capital Investors, suggested that the likely equity risk premium for a 5 to 10 year period is 5.9 per cent based on historical data.[239] However, he noted that this realised equity risk premium is probably exaggerated by a low starting point for the price to earnings ratio, making it easier for shares to provide decent returns. He stated that AMP Capital Investors' estimate of the prospective required equity risk premium for shares is around 3.5 per cent. [240]

A.4.7 Difference between cost of equity and cost of debt

SFG and VAA submitted that the spread between AAA and BBB bonds increased significantly at the time of the GFC and still remains above pre-GFC levels. They stated that this indicates that market conditions have not returned to normal.[241] However, the AER considers that data on the spread between AAA and BBB bonds is unlikely to be reliable. As discussed in greater detail in section A.5, there is a significant paucity of data on long-term bonds with credit ratings close to BBB.[242] This is likely to reduce the accuracy of yield forecasts for long-term BBB rated corporate bonds, such as those referred to by SFG and VAA. This is demonstrated by the following factors:

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237 Truong, Partington and Peat, 'Cost of capital estimation and capital budgeting practice in Australia,' *Australian Journal of Management*, vol. 33, no. 1, June 2008, p. 115.

238 NERA has assumed a value for distributed imputation credits (theta) of 0.65 whereas Envestra has proposed a value for theta of 0.35. If the assumed value for theta is 0.35, NERA's analysis would provide a weighted imputation adjusted MRP estimate of 6.2 per cent. See NERA, *Market risk premium*, April 2011, pp. 13–15.

239 This value also incorporates the imputation credit value.

240 AMP Capital Investors, 'Are shares good value & what about bank deposits?', *Oliver's insights*, 16 September 2010.

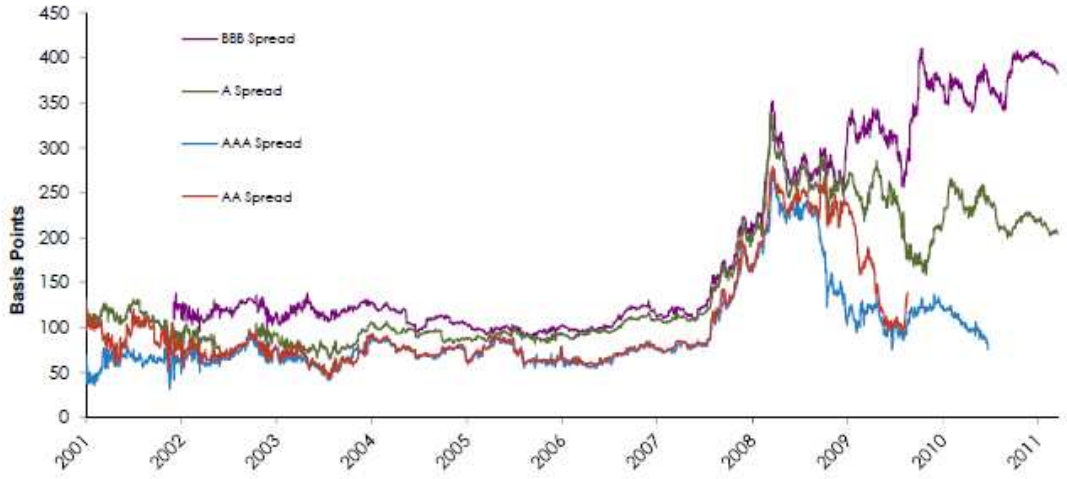
241 SFG, *Issues affecting the estimation of MRP*, 21 March 201, p 12 and VAA, *Comments on market risk premium*, March 2011, p. 2.

242 This is reflective of an illiquid Australian corporate bond market in Australia relative to a more liquid Australian equity market.

- Forecast yields on BBB rated corporate bonds from data providers such as Bloomberg have increased to levels in excess of forecast yields during the GFC, which can be seen in figure A.5. However, this is contrary to statements from the RBA, IMF and OECD, which indicate that debt market conditions have significantly improved since the height of the GFC.

- Recent observations of bond yields with similar characteristics to the 10 year BBB+ benchmark bond applied by the AER indicate observed yields on actual corporate bonds are significantly below forecasts from fair value estimates.

Figure A.5 Debt spreads on 7 year corporate bonds over 10 year Commonwealth bonds



Source: VAA, *Comments on market risk premium in draft decision by AER for Envestra February 2011*, March 2011, p. 2.

VAA submitted that there has been a narrowing of the risk premium on equity relative to the risk premium on debt. VAA noted its expectation would be that the equity risk premium would at least rise consistent with the DRP.[243] VAA also noted a report by Professor Grundy to support its expectation that the equity risk premium would rise consistent with the DRP. As noted above, the current difference between BBB and AAA rated bonds as indicated by figure A.5 is likely to be overstated. Moreover, the use of the spread between long-term BBB rated bonds and AAA rated bonds is limited by the paucity of data on long-term bonds with a credit rating close to BBB in the Australian market. It is also not unreasonable for conditions in debt and equity markets to differ from each other over time.

A.4.8 Conclusion

Based on the considerations outlined above the AER considers an MRP of 6 per cent is the best estimate in the circumstances and is commensurate with prevailing conditions in the market for funds.[244]

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[243] VAA, *Comments on market risk premium*, March 2011, pp. 3–4.
[244] NGR, r. 87(1).

The AER also considers that an MRP of 6 per cent is consistent with the revenue and pricing principles set out in section 24(2)(a) of the NGL, which states that the service provider should be provided with a reasonable opportunity to recover at least its efficient costs. The MRP of 6 per cent best meets the NGO, which 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.

A.5 Debt risk premium

This section sets out the AER's consideration of matters raised in the revised proposal regarding the AER's approach to determine the DRP in the draft decision. It also considers submissions from Envestra in response to a request by the AER for further information.[245]

The AER considers that the benchmark DRP should be based on an Australian corporate fixed rate bond issuance with a term to maturity of 10 years and a BBB+ credit rating.[246] Accordingly, the AER has compared all bonds with these characteristics, including floating rate bonds, as reported by Bloomberg and UBS.[247] In particular, the AER has considered the relevance of the following corporate bonds as possible sources of information when setting the benchmark cost of debt:[248]

- APA Group (BBB rating, maturing in July 2020)
- Brisbane Airport (BBB rating, maturing in July 2019)
- Dalrymple Bay Coal Terminal (DBCT) (BBB+ rating, maturing in June 2021)[249]
- SP AusNet (A– rating, maturing in April 2021)

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245 The AER undertook this process to provide Envestra the opportunity to comment on the AER's consideration of additional longer term observed bond yields which have become available since the release of the draft decision.

246 The 10 year benchmark reflects consistency with the term of the risk free rate, while the BBB+ credit rating reflects what the AER determined during the WACC review following consideration of comparable energy businesses. Although the SORI has no status under the NGR, it was intended to provide guidance to the gas sector. AER, *Review of the weighted average cost of capital (WACC) parameters, Statement of regulatory intent*, 1 May 2009.

247 CBASpectrum also publish observed yields for Australian corporate bonds. However, CBASpectrum no longer provide accompanying credit rating details for these issuances. It is therefore difficult to reconcile the observed bonds with their credit rating. Additionally, the sample of bonds provided by CBASpectrum is not comprehensive compared with Bloomberg and UBS. In combination, these restrictions do not allow CBASpectrum data to be used independently—that is, without cross referencing bond yields with other data service providers such as Bloomberg and UBS. Given these practical limitations, the AER has not relied upon CBASpectrum's observed yields for the purposes of this decision.

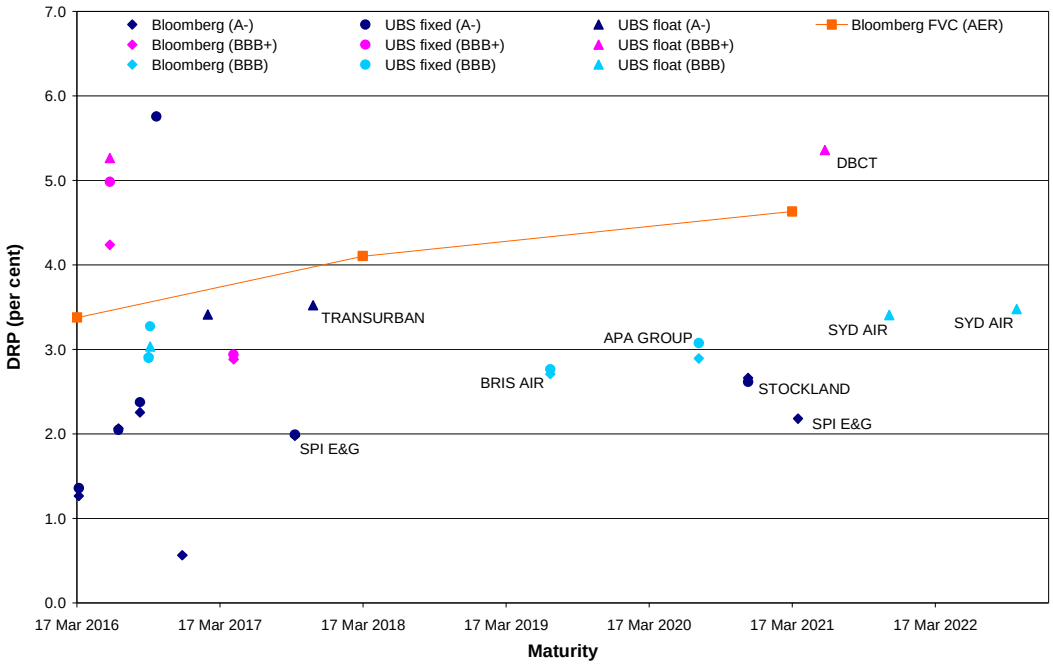
248 Observed yields for the Brisbane Airport and SP AusNet bonds only became available from 28 and 30 March 2011 respectively. As such, references throughout this appendix to the observed yields of the Brisbane Airport and SP AusNet bonds reflect average yields over the period from 1 April 2011 to 31 May 2011. Although these dates are not in Envestra's averaging period, the AER considers these bonds provide relevant information in setting the benchmark DRP.

249 The DBCT bond was originally issued by Babcock and Brown Infrastructure (BBI). In December 2009, however, BBI underwent a recapitalisation process and was renamed as the Prime Infrastructure Group.

- Stockland (A– rating, maturing in November 2020)
- Sydney Airport floating rate bonds (BBB rating, maturing in November 2021 and October 2022).

The AER has also considered the relevance of Bloomberg's fair value estimates for setting the benchmark cost of debt, as proposed by Envestra.[250] Figure A.6 plots the corporate bonds considered by the AER, along with Bloomberg's fair value estimates for five and seven years, and extrapolated to 10 years using the AER's extrapolation method.[251]

Figure A.6 Australian corporate bonds with maturities greater than five years and credit ratings ranging from BBB to A–



Source: Bloomberg, UBS, AER analysis.

Note: Yields have been annualised, and the floating rate bonds have been converted to fixed rate equivalents. While no other adjustments have been made, the AER recognises that the SP AusNet bonds include resettable coupons (that adjust the coupon rate upon a credit rating downgrade) and the DBCT bond is callable. As noted by Oakvale Capital the likely yield impact of resettable coupons is expected to be small (25 basis points).[252] Additionally, the make whole nature of the DBCT bond largely removes the yield impact of the call feature.[253]

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250 Bloomberg does not publish separate fair value estimates for BBB–, BBB and BBB+ rated debt. Instead, bonds with ratings in the generic BBB category are included in a single sample. References within this chapter to Bloomberg's BBB fair value estimates encompass bonds with a credit rating of BBB–, BBB or BBB+.

251 The AER's extrapolation approach is detailed in the draft decision. AER, *Draft decision*, February 2011, pp. 255–256.

252 Oakvale Capital, *Report on the cost of debt during the averaging period: the impact of callable bonds*, January 2011, pp. 8–9.

253 CEG, *Estimating the 10 year BBB+ cost of debt, A report for JGN*, December 2010.

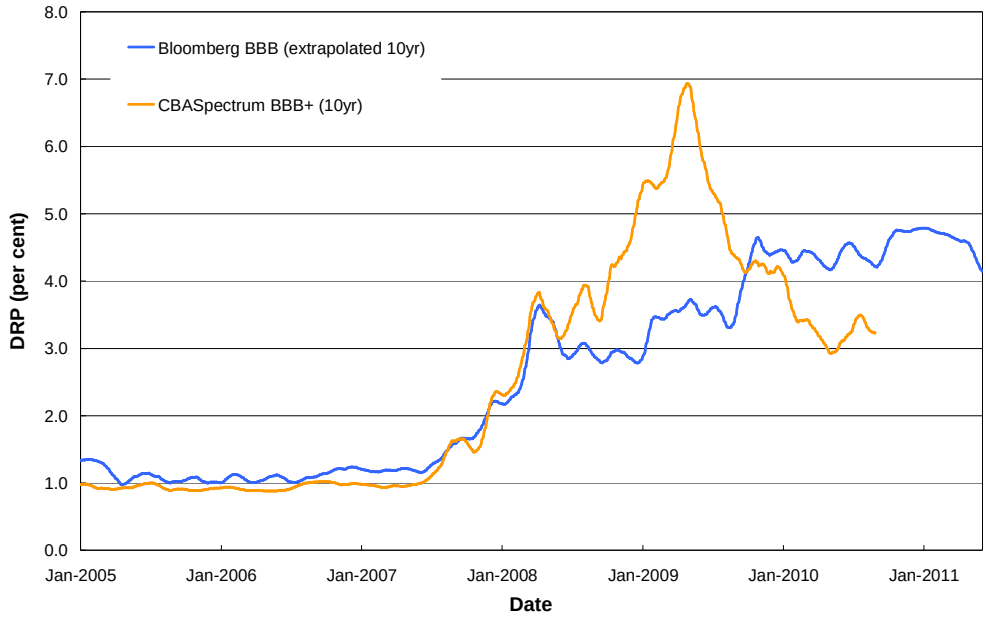
A.5.1 Bloomberg fair value estimates

The AER maintains its view that a range of evidence suggests that the behaviour of Bloomberg's fair value estimates since the onset of the GFC is somewhat counterintuitive. Specifically, Bloomberg's seven year, BBB rated fair value estimates and the spread between Bloomberg's seven and 10 year, AAA rated fair value estimates remain at near historical highs.[254]

Moreover, the AER considers that CBASpectrum's decision to cease publication of its fair value curves raises questions about the validity of using Bloomberg's fair value estimates as the only source of information when setting the DRP. In particular, the AER understands that one factor in CBASpectrum's decision was concerns about reliability, and Bloomberg's and CBASpectrum's fair value estimates rely on similar input data.[255] The fact that Bloomberg has progressively reduced the term of its BBB fair value estimates further highlights the paucity of long-term bonds in the Australian market.

In this context, figure A.7 compares the historical DRP estimates for both Bloomberg and CBASpectrum. Notably, Bloomberg's fair value estimates imply that prevailing conditions in debt markets are more risky now than during the GFC, despite substantial evidence indicating that debt market conditions have improved.[256]

Figure A.7 Comparison of debt risk premia—Bloomberg and CBASpectrum



Source: Bloomberg, CBASpectrum, AER analysis.

Envestra stated that the historically high debt margins implied by Bloomberg's fair value estimates are expected, and provided a report by McKinsey Global to support

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254 The spread between Bloomberg's seven and 10 year, AAA rated fair value estimates are used by the AER to extrapolate Bloomberg's seven year, BBB rated fair value estimates.

255 CBASpectrum website <https://www.cbaspectrum.com/Html/NewAboutSpectrum.html>.

256 The AER accepts that movements in equity markets are only one factor affecting debt risk premiums. Other factors, such as default and liquidity risks, are also important considerations when assessing bond yields. These factors are discussed in greater detail throughout this appendix.

these views. In particular, Envestra stated that investor views about the appropriate level of compensation for risk have changed, and that the regulatory environment—particularly Basel III requirements—are expected to increase future costs of capital.[257] Australia Ratings also stated that a general and significant repricing of credit risk has occurred, with a resultant impact on the composition of ratings defined indices.[258]

The McKinsey Global report, however, provided a broad economic outlook for global capital markets. It has minimal reference to Australian economic conditions, and more importantly, Australian corporate debt markets. In this context, the AER considers it is of limited relevance to the analysis of the benchmark DRP for the purposes of this decision.

That said, the AER accepts that debt margins have increased in comparison to pre-GFC levels. However, independent evidence such as the RBA's March 2011 and June 2010 bulletins, indicate that spreads have subsided markedly since peaking during the height of the GFC.

In relation to bank funding costs, the RBA's March 2011 bulletin stated that while spreads (relative to CGS) increased significantly during the crisis—from around 50 basis points to around 220 basis points for 3 year bonds—improved capital market conditions have seen the cost of issuing new debt fall to around 100 basis points (relative to CGS).[259]

In relation to lower rated debt, the RBA's June 2010 bulletin stated that as risk aversion increased during the financial crisis, spreads (relative to CGS) for BBB rated corporate bonds widened to historical highs, peaking in March 2009.[260] Consistent with its analysis of bank debt, the RBA added that spreads across all bond classes have since narrowed, though remain above the unusually low levels observed prior to the financial crisis.

The RBA's analysis is based on a weighted average of spreads on corporate bonds with remaining terms to maturity of between one and five years. However, the AER considers that for similar reasons the spreads would likely have also narrowed for longer dated bonds. The widening and subsequent contraction of corporate bond spreads, as provided by the RBA, is shown in figure A.8.

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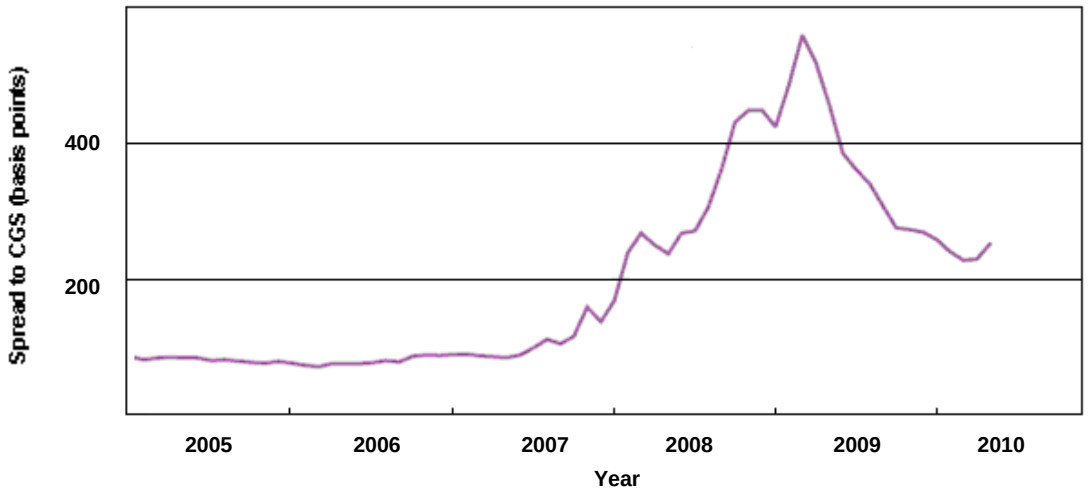
[257] Envestra, *Revised Qld access arrangement information*, attachment 9-7 (*Response to AER draft decision on debt risk premium)*, March 2011, p. 4.
[258] Australia Ratings, *Estimating the debt risk premium*, March 2011, p. 13.
[259] RBA, *Bulletin: March quarter 2011*, March 2011, p. 37.
[260] RBA, *Bulletin: June quarter 2010*, June 2010, pp. 58–59.

Figure A.8 BBB rated corporate bond spreads (term to maturity of five years)



Source: RBA, *Bulletin: June quarter 2010*, June 2010, p. 58.

Further, as noted in section A.4, recent IMF and OECD reports indicated that the market outlook for Australia has improved considerably since the onset of the GFC.[261] Moody's Investors Service also stated its expectation that default rates for speculative, Asia Pacific (excluding Japan) non-financial corporate debt will continue to decline in 2011.[262] The AER considers that these expectations, including those of the RBA, are all consistent with improving debt market conditions. On this basis, it is unreasonable to expect, as implied by the fair value estimates proposed by Envestra, that debt markets are more risky now than during the GFC.

Additionally, the proprietary nature of Bloomberg's fair value modelling limits the AER's ability to assess the factors driving Bloomberg's implied fair value curve. As noted in previous regulatory decisions, without an in depth understanding of Bloomberg's methodology, analysis can only be based on conjecture about how its fair value estimates are derived.[263] Given the limited ability to assess Bloomberg's fair value methodology, coupled with the contrary behaviour of Bloomberg's BBB rated fair value estimates (in comparison to independent market commentary), the AER maintains its position that it should remain cautious of relying solely on Bloomberg's fair value estimates to establish the benchmark DRP.

The market data that has recently become available—including bond issuances by the APA Group, Brisbane Airport, SP AusNet, Stockland and Sydney Airport—also suggests that Bloomberg's fair value estimates may not be representative of prevailing conditions in the market for funds in respect of the AER's notional benchmark service provider.[264] As figure A.9 demonstrates, the DBCT bond was the only comparable,

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261 Yan Sun, *Potential Growth of Australia and New Zealand in the Aftermath of the Global Crisis*, IMF Working Paper, WP/10/27, May 2010; OECD, *Australia economic outlook 88—country summary*, November 2010.

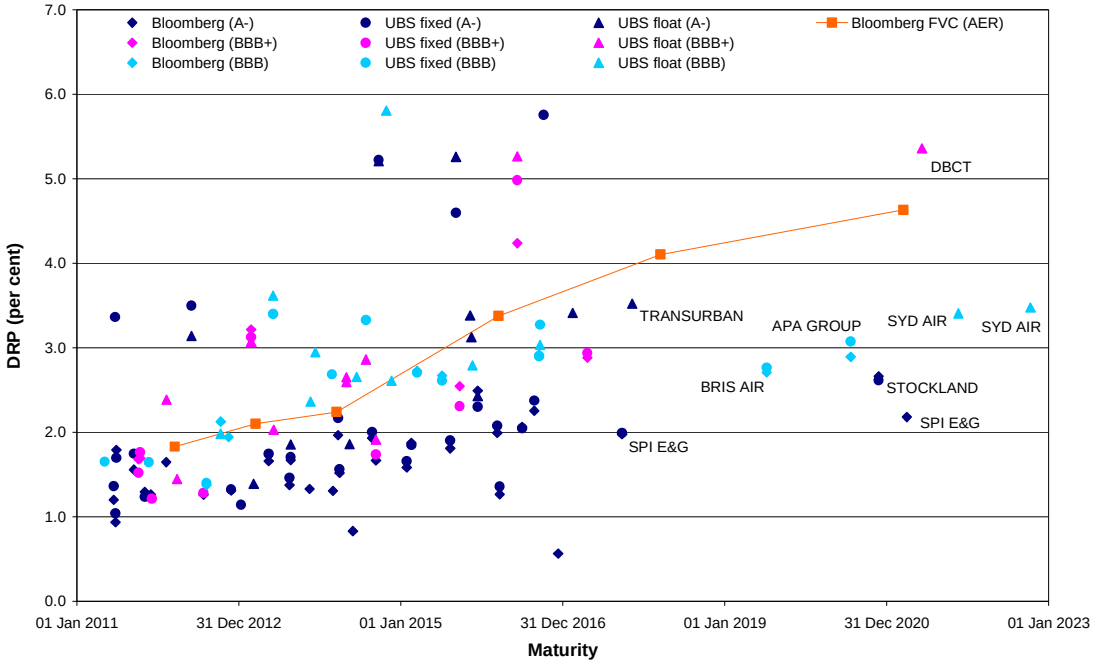
262 Moody's Investors Service, *Moody's: Asia Pacific corporate default rates will keep declining*, April 2011.

263 AER, *ActewAGL, Access arrangement proposal for the ACT, Queanbeyan and Palerang gas distribution network, Draft decision*, November 2009, pp. 67, 218–219.

264 As discussed in previous AER decisions and in the WACC review (in the context of electricity network service providers), the benchmark service provider being considered under r. 87 is a stand

long-term bond with observed yields above Bloomberg's fair value estimate during Envestra's averaging period. The AER has previously raised concerns with this bond, though notes that subsequent to the conclusion of Envestra's averaging period, the observed yields for this bond have fallen significantly. The observed yields for the DBCT bond are now below the extrapolated 10 year (BBB) Bloomberg fair value estimate).[265]

Figure A.9 Australian corporate bonds with credit ratings ranging from BBB to A–



Source: Bloomberg, UBS, AER analysis.
Note: Yields are annualised, and floating bonds have been converted to fixed rate equivalents. No other adjustments have been made.

In this context, CEG stated that observed yields for an additional seven bonds with maturities greater than seven years are available (three from Suncorp Insurance, and two each from DBCT and Vero Insurance), and should be considered by the AER.[266] The Bank of Queensland also recently issued longer term floating rate notes with a BBB credit rating. The Suncorp, Vero and Bank of Queensland bonds, however, are all callable. Therefore, consistent with the approach previously supported by CEG, the maturity dates for these bonds was considered to be the date of the first call option. For the bonds in question, this results in implied maturity dates of between three and six years. The most recent CEG report, however, stated that this approach is no longer correct. Specifically, CEG stated that these bonds should now be assessed at their final maturity date.[267]

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alone 'pure play' service provider, operating in Australia without parent ownership and the relevant market for funds is Australia. AER, *Final decision, Jemena Gas Networks, Access arrangement proposal for the NSW gas networks, 1 July 2010–30 June 2015*, June 2010, p. 113; AER, *Final decision, WACC review*, May 2009, p. 109.

265 The DBCT bonds are discussed in further detail in section A.5.4.

266 CEG, *Response to AER letter dated 23 May 2011*, June 2011, pp. 8–9.

267 CEG, *Response to AER letter dated 23 May 2011*, June 2011, pp. 10–11.

In the limited timeframe available to assess CEG's proposal, the AER has been unable to adequately verify the reasonableness of CEG's changed methodology. Regardless, the AER considers that the additional bonds noted by CEG are immaterial for this final decision.

Specifically, Oakvale demonstrated that observed yields for debt issued by financial institutions and insurance firms are typically higher than for debt issued by infrastructure firms.[268] CEG implicitly agreed with this analysis, such that it referred to the Oakvale report when stating that the mixture of infrastructure and non-infrastructure related operations may be relevant to the observed yields of the Brisbane and Sydney Airport bonds.[269] The AER considers that this significantly limits the comparability of the observed yields for the Suncorp, Vero and Bank of Queensland bonds with the AER's notional benchmark service provider.

Additionally, the Suncorp, Vero and Bank of Queensland bonds are all subordinated debt. That is, in the event of default, these bonds would have secondary claims to any outstanding senior debt. Given the likelihood of investors in subordinated debt fully recovering their initial investment (in the event of default) is substantially reduced, the yields on subordinated bonds are typically much more volatile than otherwise equivalent standard debt.[270] For this reason, the AER considers that the potential bias inherent in subordinated bonds also significantly limits the comparability of the observed yields of the Suncorp, Vero and Bank of Queensland bonds with the AER's notional benchmark service provider.

Based on the empirical market evidence discussed above, Envestra's statement that Bloomberg's fair value curve provides estimates of what it would cost to issue or trade a corporate bond with the characteristics of the AER's notional benchmark service provider appears unfounded.[271]

In relation to Envestra's statement that Bloomberg provides independent and fair value estimates, the AER considers that independence is but one factor in setting the DRP. Importantly, the AER must also have regard to the economic costs and risks of the potential for under and over investment, and the requirement to set the best estimate possible in the circumstances.[272]

A.5.2 APA Group bond

The AER considers that the characteristics of the APA Group bond—specifically, its BBB credit rating and near 10 year term to maturity—provide a close match to those of the benchmark corporate bond. Additionally, the AER does not agree with

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[268] Oakvale Capital, *Report on the cost of debt during the averaging period: the impact of callable bonds*, January 2011, pp. 17–19.

[269] CEG, *Response to AER letter dated 23 May 2011*, June 2011, p. 14.

[270] For example, an increase in the risk profile for a given business would be expected to result in a greater increase in the yield of that businesses subordinated debt in comparison to that businesses standard debt.

[271] Envestra, *Revised Qld access arrangement information*, attachment 9-7 (*Response to AER draft decision on debt risk premium)*, March 2011, p. 4.

[272] Consistent with s. 24(6) of the NGL, and r. 74(2)(b) of the NGR.

Envestra's revised proposal that the observed yields on the APA Group bond are unusually low with respect to its credit rating or other benchmark characteristics.[273]

That said, the AER maintains its position that credit ratings are not a perfect indicator of the risks involved in investment for the provision of reference services.[274] As noted by Oakvale Capital, bond yields are determined by many factors, including:

- term to maturity
- credit rating
- credit margin
- bond size
- credit wrap features
- comparable bond issuances
- market sentiment
- scarcity and desirability of issuer
- industry prospects
- financial status of issuer
- abnormal features.[275]

Synergies, in a report prepared for APT Allgas, specifically noted the importance of liquidity in pricing bonds. Synergies stated that liquidity is a critical factor in establishing the extent to which the price of a debt instrument fully reflects current information. In this regard, Synergies proposed that the APA Group bond is illiquid, and that its lack of turnover implied that the yields on the APA Group bond were not reflective of prevailing market conditions.[276]

CEG also stated that the observed yields reported by Bloomberg for the APA Group bond are of low quality, based on the confidence scores assigned by Bloomberg.[277] Observed yields for the APA Group bond, however, are published by two independent data providers—Bloomberg and UBS.[278] Moreover, these yield estimates are broadly

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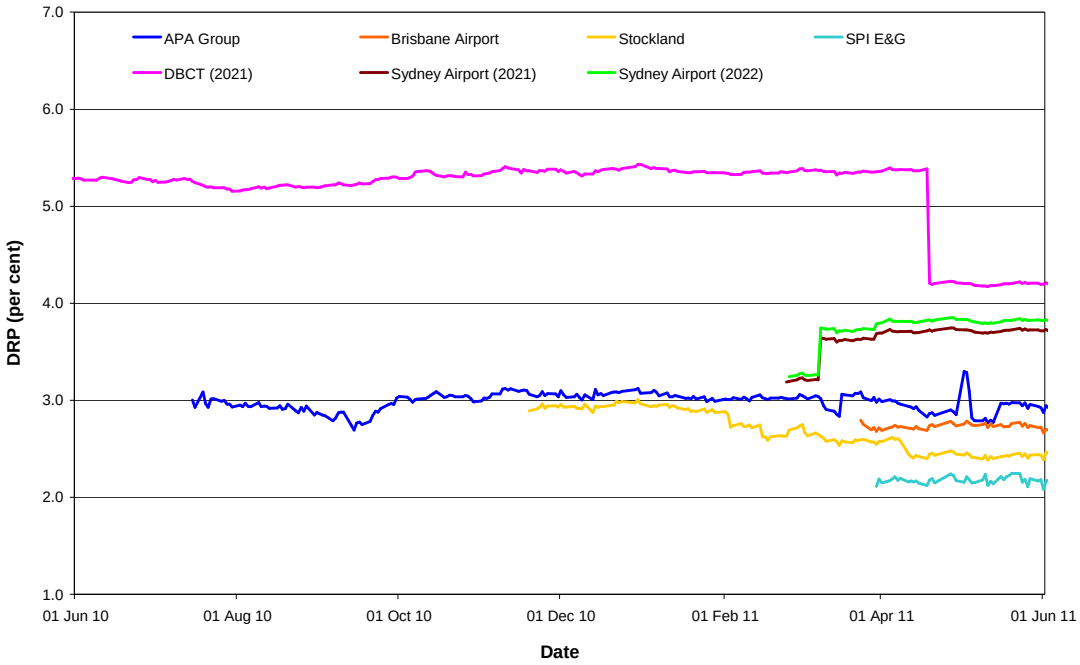
[273] Envestra, *Revised Qld access arrangement information*, attachment 9-7 (*Response to AER draft decision on debt risk premium)*, March 2011, p. 3.
[274] AER, *Draft decision*, February 2011, p. 252.
[275] Oakvale Capital, *Report on the cost of debt during the averaging period: the impact of callable bonds*, January 2011, pp. 2–3.
[276] APT Allgas, *Revised access arrangement submission*, March 2011, p. 39.
[277] CEG, *Response to AER letter dated 23 May 2011*, June 2011, pp. 22–24.
[278] The APA Group bond yields observed from Bloomberg reflect the Bloomberg Evaluated Prices (BVAL). The AER considers that while BVAL may not be the most preferred measure of bond yields published by Bloomberg—in comparison to Bloomberg Generic Prices and Bloomberg

consistent (differing by up to 18 basis points). This provides the AER with some confidence as to the robustness of the observed yields.

The yield estimates published by Bloomberg and UBS are also broadly consistent with the observed yields at issuance of the APA Group bond in July 2010. Given market conditions since July 2010 have remained relatively stable, the AER considers that in the current circumstances, Bloomberg's BVAL and UBS's published yields represent reasonable estimates of the expected yields on the APA Group bond. The relative consistency of the observed yield estimates in comparison to other comparable bonds, as shown in figure A.10, further supports the reliability of the APA Group bond yields.

Figure A.10 Comparator bond spreads from issuance



Source: Bloomberg, UBS, AER analysis.
Note: Observed yields from both Bloomberg and UBS were available for the APA Group, Brisbane Airport and Stockland bonds. As such, the spreads for these bonds reflect simple averages of the two data sources.

Additionally, the AER rejects CEG's inference that the BVAL yields of the APA Group bond are unreliable based on Bloomberg's confidence measure. Critically, the confidence scores provided by Bloomberg are a relative measure. In this context, Bloomberg will not publish observed yields when it considers such estimates do not have a sufficient basis. Accordingly, in the current circumstances the AER considers Bloomberg's BVAL estimates and UBS's published yields, provides a robust measure of observed yields that could be relied upon.[279]

Composite Market Prices—they still reflect yields published by an experienced third party data service provider based on prevailing market conditions.

[279] While the AER currently does not question the reliability of Bloomberg's individual bond yield estimates, as discussed in section A.5.1, it has concerns regarding the methodology used by

In regard to factors other than those reflected in credit ratings, the AER considers the factors specific to regulated energy networks affecting the APA Group bond to be relevant considerations in setting the benchmark cost of debt. In particular, the default risk of the APA Group's operations reflect its large, fixed investments whose returns are set in part under the regimes administered by the AER under the NGR and NER. The key features of these regimes—in contrast to investment risks in unregulated sectors—include "locked in" asset values and periodic resets of prices with respect to updated sales forecasts. Hence, to the extent that investors consider industry specific characteristics in addition to the assigned credit rating, the relatively lower risk profile of the APA Group bond should be given weight in determining a rate of return that is commensurate with the risks involved in providing reference services.

The AER also rejects Synergies' proposal that the yield on the APA Group bond is mispriced as it is below Bloomberg's seven year, BBB rated fair value estimates.[280] Bloomberg's fair value estimates rely upon a sample of bonds, some of which would lie above the implied fair value curve, and others below. In isolation, the extent that the yield on the APA Group bond lies below Bloomberg's seven year estimate implies nothing regarding the reasonableness of the observed yield, nor the expected term structure of interest rates. Synergies also assumed that Bloomberg's longer term fair value estimates are reasonable. The AER has already noted its concerns with this view, particularly in reference to the validity of Bloomberg's BBB rated fair value curve as a measure of prevailing conditions in the market for funds for the AER's notional benchmark service provider.

Given that the maturity of the APA Group bond is over two years longer than the seven year, BBB rated fair value estimates published by Bloomberg it would appear that Bloomberg may not yet take into account this bond in its fair value estimates.[281] The AER does not consider that, as proposed by APT Allgas, the exclusion of the APA Group bond from Bloomberg's seven year, BBB rated fair value estimates necessarily infer any substantive issues with the APA Group bond yields.[282] However, as discussed previously, Bloomberg's methodology regarding the derivation of their fair value estimates is proprietary. This limits the AER's ability to assess the reasonableness of the bonds included or excluded from Bloomberg's sample for the purposes of deriving its fair value estimates.

Similarly, the AER considers the analysis proposed by CEG—that the yield on the APA Group bond was unreasonable based on a parallel downward shift in Bloomberg's fair value estimate until it passes through the APA Group bond yield—to be irrelevant.[283] The analysis is flawed because the AER is not questioning the

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Bloomberg to derive its fair value estimates (for which the individual bond yields estimates are inputs).

280 APT Allgas, *Revised access arrangement submission*, March 2011, p. 30.

281 On 17 May 2011, the maturity of the longest term bond included in Bloomberg's seven year, BBB rated fair value estimate was 20 September 2016. That is, a remaining maturity of approximately five and a half years. This is considerably shorter than the benchmark 10 year term, and further supports the AER's concerns regarding the validity of Bloomberg's BBB rated fair value curve as a measure of prevailing conditions in the market for funds for the AER's notional benchmark firm.

282 APT Allgas, *Revised access arrangement submission*, March 2011, pp. 34–36.

283 CEG, *WACC estimation*, March 2011, pp. 37–38.

reliability of Bloomberg's fair value estimates for shorter maturities, where there exists a much greater sample of comparable bonds.

APT Allgas also proposed that it would be difficult to replicate the terms of the APA Group bond, as evidenced by the bond being awarded the KangaNews Australian domestic corporate market deal of the year, and Finance Asia magazine's best local bond deal. APT Allgas proposed, therefore, that the APA Group bond was not a suitable comparator for assessing the DRP.

The APA Group bond, however, was negotiated in the period directly following the GFC. The AER considers this period represented a relatively uncertain environment for domestic corporate issuers. Accordingly, to the extent that market conditions have subsequently improved—and evidence presented previously suggests conditions have moved—the AER considers that the difficulties in replicating a similar deal are likely to be overstated. The recent issuance by SP AusNet of a 10 year corporate bond—albeit, with a higher credit rating—supports this position. Similarly, the recent eight year, BBB rated bond issued by Brisbane Airport suggests that APT Allgas' concerns are unfounded.

A.5.3 Brisbane Airport, Sydney Airport, SP AusNet and Stockland bonds

Since November 2010, SP AusNet and Stockland have issued A– rated, 10 year bonds, and Brisbane Airport has issued BBB rated, eight year bonds. More recently, observed yields for two BBB rated Sydney Airport floating rate notes (maturing in 2021 and 2022) have become available.[284]

The characteristics of all these bonds—that is, their term to maturity and credit rating—are comparable to the APA Group bond, as well as the AER's benchmark bond for the purposes of setting the DRP. Moreover, as SP AusNet owns and operates network gas and electricity assets, its operations resemble those of the AER's notional benchmark service provider.

However, the ownership structure of SP AusNet—specifically, its ownership by the Singaporean Government—differs markedly from the APA Group, and from the AER's benchmark service provider. Additionally, the nature of Stockland's assets and the industry in which it operates differ to that of Envestra.[285] Brisbane and Sydney Airport's operations also differ from the AER's assumption of the benchmark service provider, although they still reflect the characteristics of a monopoly infrastructure firm.

These issues notwithstanding, and in the circumstances of paucity of data, the AER considers that the yields on the Brisbane Airport, Sydney Airport and SP AusNet bonds all provide relevant points of reference to assess the reasonableness of both

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[284] These bonds were originally issued in December 2006. Recently, observed yields have been published more frequently, including from 24 February 2011 onwards.

[285] Oakvale has demonstrated that the observed yields on infrastructure bonds are typically higher than the observed yields on the otherwise comparable corporate debt of well known Australian corporations. Oakvale Capital, *Report on the cost of debt during the averaging period: the impact of callable bonds*, January 2011, pp. 17–19.

Bloomberg's BBB rated fair value estimates and also of the APA Group bond yield. The AER also considers that the Stockland bond is a relevant reference point, albeit to a lesser extent (given the nature of its operations differ from the AER's notional benchmark service provider). In this regard, the AER considers that many factors are likely to contribute to the divergent bond yields. The magnitude of these differences, however, is significant. These yield comparisons are discussed below.

Brisbane Airport bond

The yield on the Brisbane Airport bond is 172 basis points below the extrapolated 10 year Bloomberg BBB rated fair value estimate.[286] The AER considers that this yield differential is likely to be substantially driven by the bond's shorter term to maturity, and to a lesser extent, its credit rating. That is, the Brisbane Airport bond has a remaining term to maturity of approximately eight years (as distinct from the extrapolated, 10 year estimate for Bloomberg), and a credit rating of BBB (as distinct from the Bloomberg compilation of all BBB–, BBB and BBB+ rated bonds).

The magnitude of this difference, however, is unexpected. Given the observed yields of other comparable bonds (as highlighted throughout this section) support the reasonableness of the Brisbane Airport bond yields, the magnitude of the difference suggests that either Bloomberg's BBB rated fair value estimates are not representative of longer term bond yields, or that factors other than term to maturity and credit ratings are evident.

The small yield differential between the Brisbane Airport and APA Group bonds (20 basis points) is reasonably expected, given their identical credit ratings and minimal difference in their terms to maturity.

Sydney Airport bonds

The yield on the two Sydney Airport floating rate notes (converted to fixed rate equivalents) are 119 and 110 basis points below the extrapolated 10 year Bloomberg BBB rated fair value estimate.

Given the observed yields of other comparable bonds support the reasonableness of the Sydney Airport bond yields, the direction of this difference is unexpected. That is, the Sydney Airport bonds have remaining terms to maturity of approximately seven and 18 months beyond the extrapolated, 10 year estimate for Bloomberg. All things being equal, a longer term to maturity is typically associated with a higher DRP. As such, this suggests that either Bloomberg's BBB rated fair value estimates are not representative of longer term bond yields, or that factors other than term to maturity and credit ratings are evident.[287]

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[286] As noted previously, references throughout this appendix to the observed yields of the Brisbane Airport bond reflect average yields over the period from 1 April 2011 to 31 May 2011. Although these dates are not in Envestra's averaging period, the AER considers the bond to be a relevant consideration in setting the benchmark DRP.

[287] APT Allgas stated that, similar to the DBCT bonds, the credit wrapper for the Sydney Airport bonds also collapsed during the GFC. In contrast to the DBCT bonds, however, the observed yields of the Sydney Airport bonds are consistent with other comparable bonds. The AER considers that this likely indicates that investor concerns regarding the collapse of the Sydney Airport bond's

The higher yield of the Sydney Airport bonds in comparison to the APA Group bond (47 and 58 basis points) is reasonably expected, given their identical credit ratings but longer term to maturity of the Sydney Airport bonds.

Similarly, the higher yield on the Sydney Airport bonds in comparison to the Brisbane Airport bond—approximately 102 and 116 basis points respectively—is expected given their identical credit ratings but longer term to maturity of the Sydney Airport bonds.

Stockland bond

The yield on the Stockland bond is 200 basis points below the extrapolated 10 year Bloomberg BBB rated fair value estimate. The AER considers that this yield differential is likely to be substantially driven by the bond's higher credit rating (as the term to maturity for the Stockland bond closely matches the 10 year term of the extrapolated Bloomberg BBB rated fair value estimate). That is, the Stockland bond has a credit rating of A– (as distinct from the Bloomberg compilation of all BBB–, BBB and BBB+ rated bonds).

The magnitude of this difference, however, is unexpected. Given the observed yields of other comparable bonds support the reasonableness of the Stockland bond yields, the magnitude of the difference suggests that either Bloomberg's BBB rated fair value estimates are not representative of longer term bond yields, or that factors other than term to maturity and credit ratings are evident.

The lower, but consistent yield of the Stockland bond in comparison to the APA Group bond (33 basis points) is reasonably expected, given the counterbalancing effects of the different credit ratings and terms to maturity. For example, all things being equal, Stockland's higher credit rating should be reflected in a lower yield than the APA Group bond. In contrast, Stockland's longer term should be reflected in a higher yield. As the yield on the Stockland bond is lower than the APA Group, it would appear that the credit rating (or some other factor) is the net driver for the Stockland bond yield being lower than the APA Group bond yield.

SP AusNet bond

The yield on the SP AusNet bond is 226 basis points below the extrapolated 10 year Bloomberg BBB rated fair value estimate.[288] The AER considers that this yield differential is likely to be substantially driven by the bond's higher credit rating (as the term to maturity for the SP AusNet bond closely matches the 10 year term of the extrapolated Bloomberg BBB rated fair value estimate). That is, the SP AusNet bond has a credit rating of A– (as distinct from the Bloomberg compilation of all BBB–, BBB and BBB+ rated bonds).

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credit wrapper have since subsided. APT Allgas, *Response to AER's preliminary view on DRP*, June 2011, pp. 26–27.

288 As noted previously, references throughout this appendix to the observed yields of the SP AusNet bond reflect average yields over the period from 1 April 2011 to 31 May 2011. Although these dates are not in Envestra's averaging period, the AER considers the bond to be a relevant consideration in setting the benchmark DRP.

The magnitude of this difference, however, is unexpected. Given the observed yields of other comparable bonds support the reasonableness of the SP AusNet bond yields, the magnitude of the difference suggests that either Bloomberg's BBB rated fair value estimates are not representative of longer term bond yields, or that factors other than term to maturity and credit ratings are evident.[289]

The lower yield of the SP AusNet bond in comparison to the APA Group bond (73 basis points) is reasonably expected, given the counterbalancing effects of the different credit ratings and terms to maturity. For example, all things being equal, SP AusNet's higher credit rating should be reflected in a lower yield than the APA Group bond. In contrast, SP AusNet's longer term should be reflected in a higher yield. As the yield on the SP AusNet bond is lower than the APA Group, it would appear that the credit rating (or some other factor) is the net driver for the SP AusNet bond yield being lower than the APA Group bond yield.

Overall, while the APA Group, Brisbane Airport, SP AusNet, Stockland and Sydney Airport (two issues) bonds provide only six points of reference, they all consistently indicate that the extrapolated Bloomberg fair value estimates may not be representative of longer dated, lower rated bonds. In particular, the observed yields of the APA Group, Brisbane Airport, SP AusNet, and Sydney Airport bonds support the AER's consideration that Bloomberg's BBB rated fair value curve may not be representative of prevailing conditions in the market for funds for the AER's notional benchmark service provider.

Further, the observed yields of the Brisbane Airport, SP AusNet, Stockland and Sydney Airport bonds support the reasonableness of the observed yields on the APA Group bond.

A.5.4 Dalrymple Bay Coal Terminal (DBCT) bond

The AER has previously expressed concerns over the reliability of the DBCT bonds in comparative analysis, most recently in its draft decision for NT Gas. Notably, in its draft decision the AER considered that the observed yields on the DBCT bonds (in particular, the DBCT bond maturing in June 2021) were driven primarily by factors other than its credit rating.[290]

Since the draft decision, however, the trading margins applied to the DBCT bonds by UBS have fallen significantly.[291] In particular, the trading margin on the DBCT bond maturing in 2021 has fallen by 110 basis points. Subsequently, the observed yields on the DBCT bond are now more consistent with other comparable bonds. The AER considers that one possible reason for this change is that greater certainty may now

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[289] The SP AusNet bond includes a resettable coupon feature that adjusts the yield upwards if a credit downgrade event occurs. As noted by Oakvale Capital, however, the likely impact on observed yields of resettable coupons is expected to be small, particularly when such a feature is unlikely to be required (as is the case of the SP AusNet bond). Oakvale Capital, *Report on the cost of debt during the averaging period: the impact of callable bonds*, January 2011, pp. 8–9.

[290] AER, *N.T. Gas, Access arrangement proposal for the Amadeus Gas Pipeline*, Draft decision, April 2011, p. 207.

[291] The trading margin is the spread above the swap rate that equates the yield on a floating rate bond to its fixed rate equivalent.

exist surrounding the issuer and the future status of the issue (following previous restructuring and ownership changes).[292]

The AER also considers that the significant reduction to the trading margin supports its previous decisions to exclude the DBCT bonds from its comparative analysis. That is, the magnitude of the change strongly suggests that the observed yields on the DBCT bonds were driven primarily by factors other than its credit rating.

Given the recent nature of the change, however, the AER considers that a longer period is required to properly assess the robustness of the recent observations of the DBCT bond yields. On this basis, the AER remains cautious of the reliability of the observed DBCT bond yields.

In these circumstances, the AER does not consider that excluding the DBCT bond from its analysis artificially biases the level of compensation for default risk inherent in the DRP, as proposed by Envestra.[293] To the contrary, given there remains uncertainty regarding the DBCT debt, the AER considers that relying on the DBCT bond would price default risk above that reasonably expected in the AER's notional benchmark service provider. This notwithstanding, default risk is implicitly priced in Bloomberg's fair value estimates, as well in the APA Group bond yield, for which the AER has used to set the benchmark DRP.

A.5.5 AER's method for setting the DRP

The AER considers that the evidence in support of the observed yields of the APA Group bond has strengthened significantly since the draft decision. As discussed previously, observed yields for an additional four bonds with similar terms to maturity and credit ratings as the benchmark corporate bond have become available. These observed yields all support the AER's consideration that the observed yields of the APA Group bond are more reflective of prevailing conditions in the market for funds for the AER's notional benchmark service provider than Bloomberg's (extrapolated) 10 year, BBB fair value estimates. Further, as figure A.6 demonstrates, the additional empirical evidence also suggests that Bloomberg's (extrapolated) 10 year, BBB rated fair value estimate is likely to overstate the costs of debt, particularly for regulated network service providers.

On this basis, the AER does not consider it appropriate to set the DRP based solely on the (extrapolated) Bloomberg fair value estimate. The AER considers that greater reliance could reasonably be placed on the APA Group bond to determine the DRP. However, in the current circumstances, the AER considers that some uncertainty exists regarding the appropriateness of setting the DRP based upon a single bond yield. Accordingly, the AER has exercised its judgment to determine the proportion to apply to both data sources.

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[292] DBCT Finance Pty Ltd has recently proposed US$600 million of senior secured medium term notes, due in 2020 and 2023 respectively, for which Standard and Poor's have assigned a BBB+ credit rating. As this debt is denominated in US dollars, however, the AER is limited in its ability to make any reasonable inferences from this issuance.

[293] Envestra, *Revised Qld access arrangement information*, attachment 9-7 (*Response to AER draft decision on debt risk premium)*, March 2011, p. 3.

The proportion to apply to each data source should reflect their relative suitability for the purposes of establishing a benchmark DRP. The AER considered increasing the emphasis on the APA Group bond relative to the Bloomberg fair value curve, in view of the increased support for the APA Group bond since the draft decision. However, after careful evaluation, the AER considers there are currently insufficient grounds to justify departure from the position in the draft decision. The AER considers that a DRP based equally on the observed yields of the APA Group bond and Bloomberg's fair value estimates would satisfy the requirements of the NGR.[294]

In contrast, CEG stated that relying so heavily upon a small and selective sample of bonds—that is, bonds with BBB+ credit ratings (or similar) and remaining maturities in excess of five years—is likely to lead the AER into error.[295] CEG added that the AER's methodology placed extreme weight on bonds from two issuers above the guidance provided by a wider population of 49 issuers, and that this approach is unreasonable.[296] APT Allgas also proposed that there is a basic statistical issue in placing reliance upon a sample size of one.[297]

The AER acknowledges the concerns of both CEG and APT Allgas. However, having no regard to the available longer term data (as discussed above) is equally likely to lead to error in setting the benchmark DRP, particularly with respect to section 24(6) of the NGL. That is, the wider population (from which Bloomberg uses to determine its fair value estimates) is dominated by bonds with term to maturities significantly less than the 10 year benchmark considered by the AER.[298]

Further, the AER acknowledges Australia Ratings' statement that weighting the DRP with selected individual bonds could distort the benchmark DRP. Specifically, Australia Ratings stated that weighting the index with selected individual bonds introduces the idiosyncratic risk factors of those bonds. In contrast, an index relying on many bonds would diversify such systematic risk factors.[299] The AER, however, considers that as the operations of the APA Group bond reasonably reflect those of the benchmark service provider, any additional risk incorporated into the DRP would also reasonably reflect the risks faced by gas network service providers.

As part of its review, the AER also requested and received actual costs of debt information from Envestra.[300] The AER considers that this information supports that its estimate of the DRP provides a reasonable opportunity for Envestra to recover at least its efficient costs.[301] More generally, market analyst reports have consistently indicated that the actual debt risk premiums incurred by network service providers are

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294 This decision contrasts from the most recent final decision of the AER. That decision—for the Victorian electricity distribution businesses—determined the DRP based on a 75 per cent weighting to estimates from Bloomberg and a 25 per cent weighting to estimates from the APA Group bond. The AER also notes that the Victorian final decision is currently the subject of a merits review before the Australian Competition Tribunal.

295 CEG, *WACC estimation*, March 2011, p. 34.

296 CEG, *WACC estimation*, March 2011, p. 2.

297 APT Allgas, *Revised access arrangement submission*, March 2011, p. 40.

298 See figure A.6.

299 Australia Ratings, *Estimating the debt risk premium*, March 2011, p. 15.

300 AER, *Draft decision*, February 2011, Appendix B.

301 NGL, s. 24(2).

significantly lower than the benchmark set by the AER.[302] As such, the AER does not accept that the DRP established by reference to the APA Group bond removes any incentive for efficient financing by Envestra.

Additionally, IPART recently published its final decision for a discussion paper to develop an approach to setting the debt margin.[303] The indicative debt margin was more than 170 basis points below Envestra's proposal. Although the methods used by IPART and the AER differ—notably, IPART has considered shorter term debt—the outcome of IPART's decision suggests that Envestra's proposed DRP is excessive and not commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.[304] The Economic Regulation Authority (ERA) has also recently published a draft decision with indicative debt margins more than 150 basis points below Envestra's proposal.[305]

A.5.6 Extrapolation of Bloomberg fair value estimates

The AER's draft decision rejected Envestra's proposed approach to linearly extrapolate Bloomberg's seven year fair value estimates to a 10 year term. The AER determined that extrapolation based on the spread between Bloomberg's seven and 10 year, AAA rated fair value estimates provides a better estimate of the 10 year, BBB rated yields.

Envestra's revised regulatory proposal reflected the AER's approach.[306]

A.5.7 Conclusion

The AER considers that the DRP proposed by Envestra is excessive and not commensurate with prevailing conditions in the market for funds and the risks involved in providing reference services.[307]

Moreover, based on the above analysis, the AER considers that greater reliance could reasonably be placed on the APA Group bond to determine the DRP. However, in the current circumstances, the AER considers that some uncertainty exists regarding the appropriateness of setting the DRP based upon a single bond yield. Accordingly, the AER has exercised its judgment to determine the proportion to apply to both data sources. After careful evaluation, the AER considers there are currently insufficient grounds to justify departure from the position in the draft decision. The AER considers that a DRP based equally on the observed yields of the APA Group bond and Bloomberg's fair value estimates would satisfy the requirements of the NGR. This results in a DRP of 3.81 per cent.[308]

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302 Bank of America, Merrill Lynch, *DUET Group*, 26 May 2011; Macquarie Equities Research, *Spark Infrastructure Group*, 23 March 2011; Macquarie Equities Research, *DUET Group*, 1 March 2011; Macquarie Equities Research, *Envestra*, 17 February 2011; Macquarie Equities Research, *A Regulated Corner - A little gem from IPART*, 14 February 2011.

303 IPART, *Developing the approach to estimating the debt margin, Other industries*, Final decision April 2011.

304 NGR, r. 87(1).

305 ERA, *Draft decision on proposed revisions to the access arrangement for the Dampier to Bunbury natural gas pipeline*, March 2011, p. 168.

306 Envestra, *Revised Qld access arrangement information*, attachment 9-7 *(Response to AER draft decision on debt risk premium)*, March 2011, p. 2.

307 NGR, r. 87(1).

308 Based on a 15 day averaging period ending 17 March 2011.

B. Real cost escalators

In its draft decision, the AER did not accept aspects of Envestra's proposed forecast real input cost escalators. In particular, the AER did not accept Envestra's proposed:

- labour cost escalators, on the basis of Envestra's choice of wage index and non-inclusion of productivity amendments
- 'gas network materials' escalator, on the basis that Envestra did not sufficiently demonstrate that it produced a reasonable forecast of polyethylene pipeline costs.[1]

Envestra did not accept the draft decision amendments to the forecast real cost escalators, and made further revisions in relation to:

- labour cost escalators
- 'gas network materials' escalator
- the application of annually forecast real cost escalators.[2]

Envestra proposed revised real cost escalator forecasts, and provided more information in support of its proposed revisions, including consultant reports from:

- BIS Shrapnel
- Professor Jeff Borland
- Economic Insights.

The AER considers Envestra's labour and 'gas network materials' escalation forecasts are not reasonable, or the best forecasts possible in the circumstances. In particular, the AER does not accept the following elements of Envestra's proposal:

- wage forecasts based on the average weekly ordinary time earnings (AWOTE) index
- non-inclusion of productivity adjustments
- 'gas network materials' forecast methodology
- application of six year average real cost escalators.

B.1 Labour cost escalators

Envestra did not accept the AER's draft decision amendments to the proposed real labour cost escalators, and proposed further revisions.

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1 AER, *Draft decision*, February 2011, p. 150.
2 Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 6–9, pp. 11–12.

Envestra's updated real labour cost escalation:

- is based on the AWOTE measure of wage growth
- includes specific productivity adjustments to transform wage forecasts into labour costs.[3]

The AER does not accept Envestra's revised input cost escalators. The AER considers Envestra's labour cost forecasts were not arrived at on a reasonable basis, nor do they represent the best possible forecasts in the circumstances, for the reasons outlined below:

- Envestra's labour cost escalation forecasts are based on AWOTE
- the proposed escalators do not account for the effect of productivity in transforming wage forecasts to labour cost forecasts.

As a result, the forecasts do not contribute to forecasts of operating or capital expenditure that are respectively consistent with r. 79 or r. 91 of the NGR.

The AER engaged Deloitte Access Economics (DAE) to provide updated forecasts of real labour cost growth.[4] The AER is satisfied that DAE's forecast growth in real labour costs are arrived at on a reasonable basis, and are the best forecasts possible in the circumstances.

B.1.1 Choice of Index measure

The AER considers that the LPI, and not AWOTE, is the appropriate index on which to base forecasts of real labour cost escalation, as it produces forecasts that are made on a reasonable basis and the best forecasts possible in the circumstances. The AER maintains its position from the draft decision that the AWOTE is not a reasonable base on which to forecast labour cost escalation,[5] on the basis that :

- while AWOTE takes into account the effect of compositional productivity on labour costs, LPI does not. This is described at length in the reports provided by Envestra's consultants.
- Envestra and its consultants over-state the significance of compositional productivity, as it is just one of many distortionary compositional effects that produce un-realistic index volatility at the state-sectoral level.
- the presence of compositional effects make AWOTE a poor index choice. The AWOTE index, when used to generate labour cost forecasts at a state-sectoral

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3 Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 6–9, pp. 2–10.

4 For the draft decision, the AER engaged Access Economics to provide alternative forecasts of real labour cost escalators. Since the draft decision, Access Economics was acquired by Deloitte Touche Tomahatsu, and has continued to provide analysis to the AER under the name Deloitte Access Economics. All references in the text are made to Deloitte Access Economics, but some footnoted references to previous work are made to Access Economics, as it was at the time.

5 AER, *Draft decision*, February 2011, pp. 138–141.

level, produces extremely volatile results. The inherent volatility in AWOTE is unlikely to be a realistic depiction of industry-wide fluctuations of labour costs.

Figure 8 shows the progression of the two indexes in the national EGW sector from 1998 to 2010 – LPI and AWOTE. From the figure, it is apparent that LPI is much more stable index over time. Moreover, it is expected that AWOTE time series will likely to be even more volatile at the state-sectoral level, as the sample size in the surveyed businesses decreases. As stated in its draft decision, the AER considers that AWOTE is unlikely to provide a reasonable reflection of the true movements in the price of labour faced by Envestra.

Figure B.1: Growth in AWOTE and LPI, Australian utilities sector[6]

The AER considers that, in the revised proposal, neither Envestra nor its consultants have sufficiently addressed the issue of AWOTE volatility at the state-sectoral level. In its draft decision, the AER accepted that the effects of compositional productivity might be informative at a full economy level. However, in the circumstances of forecasting real labour cost escalation, forecasts are disaggregated to specific industries in specific states. The small sample size coupled with acute sensitivity of the index to a number of compositional effects result in a forecast series that is not a reasonable reflection of changes in the price of labour, or labour costs. Also, compositional productivity is only one of the many compositional effects that can lead to unrealistically exaggerated volatility. These include, amongst other things: gender distribution, pace of retirement and the degree of outsourcing.[7] The AER considers these factors, when surveyed from a very small sample, produce unrealistic expectations of sector wide labour cost growth.

In his report for Envestra, Professor Borland recognises that the AWOTE index is more volatile than the LPI index, and that this is why the ABS considers the LPI is the 'preferred indicator of changes in wage rates'. However, Professor Borland proposes that this volatility could be overcome by determining trends using multiple data points to forecast single period changes.[8] As identified by DAE,[9] the AER considers that de-

6 ABS and AER analysis.
7 Deloitte Access Economics, *Response to Professor Borland*, April 2011, p. 2.
8 Professor Jeff Borland, *Labour cost escalation report for Envestra Limited*, March 2010, p. 10
9 Deloitte Access Economics, *Response to Professor Borland*, April 2011, p. 5.

trending data is unlikely to sufficiently remove volatility from recent data points, as no future observations are available to sufficiently de-trend recent data. De-trending data is best employed where the trend estimates can be revised on an ongoing basis, such as publishing seasonally adjusted statistics. This is not possible where forecasts are binding for the entire access arrangement period. The AER does not accept that this will result in a forecast that is arrived at on a reasonable basis, or the best forecast possible in the circumstances.

B.1.2 Productivity adjustments

The AER considers that specific productivity adjustments are necessary to transform wage forecasts into forecasts of real labour costs. The AER considers:

- while pure wage forecasts (generated by productivity unadjusted LPI) are of concern to individual workers, labour costs per unit of output are relevant for the purpose of forecasting labour costs

- in order to transform pure wage forecasts into labour costs per unit of output, productivity adjustments are applied to the pure wage forecasts

- the productivity adjusted labour cost forecasts prepared by DAE are arrived at on a reasonable basis, and represent the best forecast possible in the circumstances.

The AER identified an inconsistency in Envestra's revised access arrangement proposal on the treatment of productivity adjustments. In its revised access arrangement proposal, Envestra did not accept the AER's application of productivity adjusted labour cost forecasts, and has proposed they should not be included. [10] However, in the summary tables where Envestra has set out its forecast real cost escalators, it has applied the productivity adjusted AWOTE forecasts derived by BIS Shrapnel.[11] The AER sought further clarification from Envestra on this matter. Envestra subsequently stated that it accepts the AER can apply labour escalation based on:

- AWOTE adjusted for productivity

- LPI unadjusted for productivity.[12]

The AER therefore understands that Envestra accepts the application of LPI, and of specific productivity adjustments, but not both concurrently. The AER does not accept that the appropriateness of productivity adjustments depends on whether it is paired with AWOTE or LPI, as the productivity adjustments are necessary to transform either wage forecast into a forecast of labour costs. The AER maintains its draft decision and rejects Envestra's revised access arrangement proposal to base forecasts on AWOTE or exclude productivity adjustments.

It is widely accepted that productivity is a key driver of movements in relative wages. In its wage forecasting model, DAE assumed that more productive workers will be

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10 Envestra, *Revised Qld access arrangement information, Attachment 6-9*, March 2011, p. 6.
11 Envestra, *Revised Qld access arrangement information, Attachment 6-9*, March 2011, pp. 32–33.
12 Envestra, *Response to AER.EN.RP.11*, 4 May 2011.

compensated with higher wages.[13] Subsequent to the initial wage forecasting, DAE applied explicit productivity adjustment to generate labour costs per unit of output. This second steps reflects the assumption that a more productive workforce will see a lower labour cost per unit of output, as the same level of output now requires fewer workers.

In effect:

- positive productivity growth will typically result in higher wages for individual workers. However, there will also be an offsetting reduction in labour costs per unit of output, as less labour is needed to produce a given level of output.

- negative productivity growth will tend to slow wage growth, but will also lead to a corresponding increase in unit labour costs as the labour requirement to produce a given level of output increases.

Envestra asserted that the specific productivity adjustment to LPI results in a 'triple counting' of productivity effects, namely:

1. use of LPI rather than AWOTE does not capture the effects of compositional productivity
2. adjustment of the LPI for forecast changes in productivity (DAE's specific productivity adjustment)
3. directly incorporating productivity improvements into the opex benchmarks.[14]

The AER does not accept Envestra's assertion for the reasons set out below.

The AER accepted in its draft decision that the LPI does not capture compositional productivity effects, which account for *some* difference between the LPI and AWOTE. However, the AER considers Envestra and its consultants have overstated the effects of compositional productivity. As identified by DAE, compositional productivity is only one of the many compositional effects that can lead to unrealistically exaggerated volatility. These include, amongst other things: gender distribution, pace of retirement and the degree of outsourcing.[15] The AER considers, in line with DAE,[16] that any error from the absence of these compositional productivity effects is unlikely to be large.

The specific productivity adjustment (adjustment 2) is necessary to forecast labour cost escalation, because Envestra's required units of labour are a function of the work Envestra undertakes. The AER considers it reasonable to assume that Envestra targets a particular level of labour output, as opposed to choosing a desired number of employees, and plan work output accordingly. Under the national gas objective, the guiding principles of gas regulation promote the efficient investment in, and operation of natural gas services.[17] The AER considers this directly supports an assumption that

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13 Access Economics, *Forecast growth in labour costs (Qld & SA)*, November 2010, p. 103.
14 Envestra, *Response to AER.EN.RP.11*, 4 May 2011.
15 Deloitte Access Economics, *Response to Professor Borland*, April 2011, p. 2.
16 Deloitte Access Economics, *Response to Professor Borland*, April 2011, p. 6.
17 NGL s. 23.

the level of opex and capex output to efficiently invest in and operate Envestra's network would guide business planning. This in turn is consistent with escalating real labour cost per unit of output, as opposed to real wages. Failure to include the specific productivity adjustments will produce a forecast that is neither made on a reasonable basis, nor the best forecast possible in the circumstances.

Envestra's 'productivity adjustments' within its opex forecasts (adjustment 3) reflect the reduction in the overall required level of UAG related opex to be completed, which sets the necessary level of work output. It is therefore consistent with these forecast levels of required opex to forecast the labour costs required to meet that level of output. As such, the AER considers forecasts of real labour cost escalation based on productivity adjusted LPI are both reasonable, and the best forecasts possible in the circumstances.

The AER considers that DAE's forecasts of productivity over the period are consistent with DAE's forecasts of a recovering economy, in which productivity is expected to improve through the access arrangement period. The effect of forecast productivity adjustments on the AER's revised labour cost escalators is set out in table B. 1.

Table B.1: Effects of productivity adjustments on Queensland real LPI forecasts (per cent)

	2010–11 (opex roll-forward)	**2011–12**	**2012–13**	**2013–14**	**2014–15**	**2015–16**
	Labour costs (Productivity adjusted real LPI)					
EGW labour	3.2	1.4	0.9	0.0	-0.6	-1.6
General labour	1.4	0.4	0.2	-0.3	-0.6	-1.5
Construction labour (capex only)		0.9	1.3	1.2	1.3	0.8
	Wages (Productivity unadjusted real LPI)					
EGW labour	1.7	2.2	2.0	1.5	1.3	0.6
General labour	0.6	0.9	1.3	1.2	1.3	0.8
Construction labour (capex only)		0.6	2.4	2.8	2.1	2.1

Source: Deloitte Access Economics, *Forecast growth in labour costs: Update of December 2010 report*, April 2011, pp. 47–48.

B.1.3 Deloitte Access Economics labour cost forecasting

The AER did not accept Envestra's proposed labour cost escalators in its draft decision, and amended the real cost escalation rates to reflect DAE's forecasts of real productivity-adjusted LPI growth. In its revised access arrangement proposal, Envestra engaged three consultants to examine and critique DAE's forecasts. Envestra and its consultants submitted the following in relation to DAE's forecasts:

- DAE's wage forecasting methodology is flawed on the following grounds:[18]
    - the formal AEM wage forecasting model is inferior to BIS Shrapnel's 'institution based' approach, as it does not incorporate institutional factors that are specific to the sector
    - the wage modelling is based purely on econometric analysis, and ignores institutional factors
    - BIS Shrapnel's attempt to replicate the DAE forecasting methodology produces unrealistic results
- DAE's productivity forecasts were overly optimistic relative to productivity forecasts made in September 2009[19]
- the forecasts did not take into account significant recent economic developments, such as the Queensland storms, Cyclone Yasi, and the development of the coal seam methane industry. [20]

The AER engaged DAE to respond to the reports provided by Envestra and its consultants, in addition to providing updated forecasts. The AER is satisfied that DAE's updated forecasts of real productivity-adjusted LPI growth are made on a reasonable basis, and are the best forecasts possible in the circumstances. The AER considers:

- BIS Shrapnel has misinterpreted DAE's methodology, in which the sectoral wage modelling is not, as BIS Shrapnel indicates, based on econometrically estimated relationships. DAE sets the parameters in its sectoral wage models to incorporate, amongst other things, institutional factors such as trends in industry EBA rates The sectoral wage models take inputs from the AEM, which is econometrically estimated and adjusted to incorporate the institutional factors that BIS Shrapnel advocates considering.
- DAE's productivity forecasts are based on a reasonable and robust methodology, and are consistent with expectations of a recovering economy, where the outlook was significantly less positive at the time of the September 2009 report.
- DAE's updated forecasts incorporate the effects of recent significant economic events, including those referred to by Envestra and its consultants.

The AER does not accept Envestra's forecast real labour cost escalators, for the reasons set out in sections B.1.1 and B.1.2. The AER considers there is an accepted alternative methodology from which to derive alternative results, and is satisfied that

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18 BiS Shrapnel, *Final report, Real cost escalation forecasts to 2015/16—Queensland and South Australia*, March 2011, Appendix C.

19 Professor Jeff Borland, *Labour cost escalation report for Envestra Limited*, March 2011, pp. 11–13; and Economic Insights, *Review of AER draft decision on Envestra Queensland's and Envestra South Australia's Input Price Escalators*, March 2011, pp. 7–8.

20 Envestra, *Revised Qld access arrangement information*, March 2011, Attachment 6-9, p. 31.

DAE's forecast growth in real labour costs are arrived at on a reasonable basis, and are the best forecasts possible in the circumstances.

DAE forecasts long term wage outcomes by taking into account macroeconomic conditions impact on labour productivity and inflation. The current forecasts of wage and productivity growth are broadly influenced by the following factors:

- expected recovery in global economic growth
- forecast increases in industrial commodity prices and national income
- expected increases in real business investment and capital utilisation, particularly in the utilities sector
- growth in employment is expected to be offset by reductions in working age Australian population growth.[21]

In addition, DAE's forecasts incorporate the effects of recent natural disaster events in Queensland and Victoria, and important project-based economic developments, [22] as referred to by Envestra and its consultants. While these events are expected to drive up the demand for labour, these effects are likely to be temporary. Other economic factors, such as expected increases in the interest rate and decreases in finance and building approvals, are expected to constrain the growth in the construction sector.

B.2 'Gas network materials' cost escalator

The AER considers that 'gas network materials' should not be escalated in real terms, as Envestra has based its proposed escalators on forecasts that are neither made on a reasonable basis, nor the best forecasts possible in the circumstances. Envestra did not accept the AER's decision that 'gas network materials' should not be escalated in real terms. Consequently, Envestra has proposed an updated forecast series.

The AER does not accept Envestra's proposed gas network materials escalator, as the forecast is neither made on a reasonable basis, nor the best forecast possible in the circumstances. In response to the AER's draft decision, BIS Shrapnel provided some additional detail on its forecast methodology. Having assessed the updated BIS Shrapnel report, the AER considers the BIS Shrapnel report:

- has not demonstrated an empirical relationship between oil prices and polyethylene pipeline prices. BIS Shrapnel has relied on two intermediate relationships: one of which is empirically tested, one of which is not.
- presented the results of a regression to determine a relationship where oil prices influence thermoplastic resin prices in $USD, then indicated it ran the same regression in $AUD to determine the relevant coefficients for its forecasts, but not directly report the results

[21] Access Economics, *Response to the Economic Insight Report of March 2011*, 24 April 2010, p.2-5.
[22] Access Economics, *Response to the Economic Insight Report of March 2011*, 24 April 2010, p.6-8.

- used a 'rise and fall' formula to estimate changes in a polyethylene pipe prices based on seemingly arbitrary coefficients that have not been justified

- has included a demand escalator in the rise and fall formula that has only been described in general terms, without giving detail on the calculation and application of the demand escalator, or demonstrating its significance as an explanatory variable

- based price forecasts on a weighted average index of pipeline prices that assumes a constant ratio of the four pipeline types.[23]. Envestra argue that the base year efficiency adjustment to opex in the AER's draft decision was inappropriate, on the basis that Envestra's concentration of different mains pipeline diameters changed throughout the period. These changes could influence the demand, and hence prices paid for particular types of pipeline

- based forecasts on thermoplastic resin prices, which are only available from 1997-1999. BIS Shrapnel has not clarified where the remaining data points have been derived from.

- used indexes are based on nominal prices (including US inflation) and deflated by Australian CPI, which are unlikely to be consistent.

The AER considers there is no quantifiable basis to conclude that polyethylene pipeline costs will escalate in real terms. Further, the AER is not aware of an alternative model to forecast polyethylene pipeline prices. When assessing forecast commodity prices, the AER does not consider it is appropriate or consistent with r. 74 of the NGR to rely solely on judgement of the numbers to form a view of whether a forecast is acceptable. To do so would rely on strong assumptions about the data, progression of the economy and determinants of price changes. Instead, the AER must be satisfied that a forecast is derived based on a reasonable and robust methodology in order to accept that its output forecasts contribute to an efficient forecast of capital or operating expenditure.

In its decisions for Country Energy, ActewAGL and the Jemena Gas Network,[24] the AER did not accept plastic pipeline cost escalation forecasts derived based on similar relationships to the BIS Shrapnel methodology. In all cases, the AER concluded that 0 per cent real cost escalation was appropriate, implying that plastic pipeline would be annually escalated by CPI. The AER has generally accepted materials escalators where it has access to the prices of futures, where investors have financially committed to valuations of expected price growth. No such data exists for polyethylene, or polyethylene pipeline, or thermoplastic resin. Table B.2 sets out some comparative measures of observed[25] and forecast weighted average pipeline prices against CPI.

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23 Envestra, *Response to AER.EN.RP.09*, 3 May 2011.

24 AER, *JGN final decision*, June 2010, p. 85; and AER, *Country Energy draft decision*, November 2009, p.28.; and, AER, *ActewAGL final decision*, March 2010, p. 26.

25 These are the prices faced by Envestra since 2005, and are an extremely limited sample on which to draw conclusions about the competitive prices faced by an efficient service provider.

Table B.2: Comparison of annual per cent change in pipeline prices, oil prices and CPI

	Weighted average pipeline prices (2005–10)	CPI (2005–10)	Crude Oil Prices (2005-10)	Forecast weighted average pipeline prices (2011–16)	Forecast CPI (2011-16)
Mean	3.95	2.73	12.52	4.36	2.57
Standard deviation	11.01	0.65	24.31	4.06	-

Source: AER Analysis; BIS Shrapnel, *Real cost escalation forecasts to 2015–16,* March 2011, p. 59.

In relation to table B.2, the AER considers:

- Both forecast CPI and forecast weighted average pipeline prices have 6 year average growth rates that are comparable to that of weighted average pipeline prices from 2005–10.
- Oil prices, on which forecast pipeline price estimates are based, have a significantly higher mean (which may not be relevant due to the transformation formulae) and are much more volatile than observed pipeline prices.
- Given the limited availability of data on pipeline prices, it is difficult to draw meaningful conclusions about whether the observed prices from 2005–10 represent a normal level of growth in prices to check against, or use in forecasts.
- Most importantly, the AER does not consider there is sufficient evidence to suggest CPI will not adequately compensate Envestra.

All of Envestra's real costs are escalated annually by CPI under its tariff variation mechanism. For this reason, CPI must inform the AER's underlying assumptions about Envestra's overall input costs. Where the AER cannot be satisfied that a forecast of real cost escalation for a specific commodity is robust, and cannot determine a robust alternative forecast, CPI is a reasonable estimate of growth in the broad range of input prices faced by Envestra, and is the best forecast possible in the circumstances. Envestra proposed CPI as an escalator for all other materials in its initial proposal, which the AER accepted. In order for the AER to conclude that specific input prices will deviate in real terms, this expectation must be supported by a forecast that is consistent with r. 74 of the NGR. The AER considers it is not reasonable to assume costs will escalate in real terms over a five year period where it is not based on a robust forecast.

Having considered Envestra's revised access arrangement proposal, the AER considers the forecast 'gas network materials' escalator is based on unjustified assumptions and unsubstantiated relationships. The AER therefore is not satisfied the forecasts are made on a reasonable basis, nor the best forecasts possible in the circumstances. On this basis, the AER does not consider that real cost escalation of

'gas network materials' results in a capex allowance that is consistent with r. 79(1)(a) of the NGR, or an opex allowance with r. 91(1) of the NGR.

The AER considers CPI produces a forecast of growth in Envestra's materials costs that is made on a reasonable basis, and is the best possible in the circumstances. As all materials costs are escalated by CPI under the tariff variation mechanism, the AER does not accept a specific real cost escalator for 'gas network materials'.

B.3 Application of real cost escalators

The AER does not accept Envestra's proposed application of real cost escalators. Envestra proposed real cost escalators based on specific annual forecasts in the text of its revised proposal, and in its initial proposal, but applied several escalators in its revised opex and capex forecast models as constant rates of escalation based on six year averages.[26] Envestra did not propose, or raise the option of proposing, average escalators in its initial proposal or models. The AER therefore considers the revised proposal is not permitted under r. 60(2) of the NGR. Further, the AER considers that:

- real cost escalation forecasts require detailed estimates of annual input cost changes. Averaging the forecasts necessarily deviates from the expected costs at any point in time, and therefore reduces the efficiency of the forecast
- Envestra has not provided any justification for applying average escalation rates, and it applied specific annual rates in its initial proposal.

For these reasons, the AER considers the application of six year average rates produces forecasts that are neither made on a reasonable basis, nor the best forecasts possible in the circumstances. As a result, the proposed average escalators do not contribute to forecasts of operating or capital expenditure that are respectively consistent with r. 79 or r. 91 of the NGR. The AER considers that real input costs should be updated annually in line with the approved forecast real cost escalators.

B.4 Conclusion

The AER does not accept Envestra's:

- proposed labour escalators
- 'gas network materials' escalators,
- application of 6 year average escalators

The AER considers the forecasts are not made on a reasonable basis, nor the best forecasts possible in the circumstances, and therefore do not comply with r. 74 of the NGR. As a result, the proposed escalators do not contribute to forecasts of operating or capital expenditure that are respectively consistent with r. 79 or r. 91 of the NGR.

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[26] Envestra, *Revised Qld access arrangement information, Attachment 7-6A,* March 2011; and Envestra, *Revised Qld access arrangement information, Attachment 6-7A,* March 2011.

The AER also does not accept Envestra's proposed application of six year average escalators.

The AER requires Envestra to apply the escalators set out in table B.3, in line with the specific escalator forecast for that year, as opposed to the six year average.

Table B.3: AER conclusion on real cost escalators (per cent)

	2010–11 (opex roll-forward)	**2011–12**	**2012–13**	**2013–14**	**2014–15**	**2015–16**
EGW labour	3.2	1.4	0.9	0.0	-0.6	-1.6
General labour	1.4	0.4	0.2	-0.3	-0.6	-1.5
Construction labour (capex only)		1.3	1.4	0.8	0.0	-0.9
Gas network materials	-	0	0	0	0	0
Other materials	0	0	0	0	0	0

C. Annual reporting requirements

In a number of chapters of the draft decision and this final decision, the AER has indicated that Envestra will have to report certain information on an annual basis. This information is generally required for the administration of an incentive mechanism, to ensure compliance with an approved tariff variation mechanism, or to otherwise monitor Envestra's performance and compliance with this decision.

This appendix provides a summary of the information Envestra must report to the AER during the access arrangement period. The AER anticipates that some of this information would be reported annually, for example as part of an annual tariff variation proposal. Otherwise, the AER anticipates this information will be collected by the AER via a regulatory information instrument. This appendix is not exhaustive of the information the AER may seek through any regulatory information instrument.

Information contained in the table below has been drawn from the chapters of the draft decision and this final decision.

Table C.1: Annual reporting requirements

Reference	Reporting requirement	Purpose
Capital contributions – chapter 3 (draft decision)	For each year, provide details of the nature and value of capital contributions received from users.	To identify the nature and value of capital contributions. Rules 82(2) and 82(3) of the NGR allow the AER to roll into the capital base a capital contribution, provided that the access arrangement contains a mechanism to prevent the service provider from benefitting through increased revenue from the user's contribution to the capital base.

Reference	Reporting requirement	Purpose
Incentive mechanism – chapter 7	Where there is a change in approach to classifying costs as either capex or opex, a detailed description of the change and a calculation of its impact on forecast and actual opex. Details to quantify and substantiate scope changes which impact on the original benchmarks. Details of specific uncontrollable costs incurred and reported by Envestra, which Envestra proposes the AER considers for exclusion from the operation of the incentive mechanism in accordance with the NGL and NGR. An outline of the calculation of the efficiency carryover amount for the year including identification of any adjustments made to actual or benchmark costs (e.g. exclusions).	To identify the actual total controllable opex costs for the purposes of the incentive mechanism. To identify the actual opex amounts attributable to each approved excluded cost category during each regulatory year. To determine the efficiency carryover amount each year for the application of the incentive mechanism.
Annual reference tariff variations – chapter 12	For each year, on or around 15 April, notify the AER in respect of any reference tariff variations such that variations occur on 1 July, and include: ■ the proposed variation to reference tariffs ■ an explanation and details of how the proposed variations have been calculated ■ an independent statement to support the gas quantity inputs in the tariff variation formula. The statement should be independently audited or verified and the quantity input will reflect the most recent actual annual quantities available at the time of tariff variation assessment.	Annual tariff variation approval.

D. AER's consideration of proposed non-tariff terms and conditions and issues raised in submissions

Matter	Amendments required as per AER draft decision	Envestra's response as per revised proposal	AER's proposed amendments, Envestra's response, submissions and AER's consideration	Proposed Revisions
Part 1: Terms and conditions for which Envestra has proposed revisions				
Delivery of gas (clauses 2.4, 2.5 and 16.6)[1]	Amendments 13.1 and 13.2.	Amendments 13.1 and 13.2 not incorporated	Amendment 13.1 of the draft decision required Envestra to amend annexure G of the access arrangement proposal by inserting the words 'Subject to clause 2.5A,' at the start of clause 2.4 and clause 2.5, and inserting new clause 2.5A. Amendments 13.2 of the draft decision required Envestra to amend annexure G of the access arrangement proposal by changing existing clause 16.6 to clause 16.6(a), inserting the words 'Subject to clause 16.6(b),' at the start of clause 16.6(a) and inserting new clause 16.6(b). AER proposed new clause 2.5A/ 16.6(b) in draft decision 'Envestra will use reasonable endeavours to mitigate any loss to the Network User as a consequence of Gas being taken through the User DP by someone other than the Network User or a Network User's customer.' Envestra's response Envestra has not accepted the above amendments. Envestra believes that these amendments are based on a misunderstanding as to the legal effect of these clauses and the proposed amendments do no make practical sense. Envestra submitted that the AER proposed clauses are not only impractical but legally problematic, since Envestra has no authority to monitor the use of gas past the delivery point. Envestra has agreed that these clauses are new in the superficial sense that they did not appear in the earlier terms and conditions. However, Envestra has submitted that they are not new in a substantive sense because these clauses do not change Envestra's liability profile. Envestra has submitted that the purpose of proposed clauses 2.4, 2.5 and 16.6 is same as the clause 2.2 in Annexure G of its earlier access arrangement.[2] The clauses state what	

[1] All references to 'clauses' in this appendix relate to annexure G of Envestra's Qld access arrangement proposal, unless otherwise stated.

[2] Envestra, *Qld access arrangement terms and conditions*, October 2006, p. 26.

			Envestra believes is a straightforward and uncontroversial principle in relation to the delivery of Gas through User DPs. The proposition is that Envestra is required to deliver whatever Gas is taken through a User DP, regardless of who takes that Gas. Comparing with clause 2.2, Envestra stated that it was required to deliver gas "whether the taking of that Gas is or not specifically authorised." The legal effect of the clauses is the same. Clause 2.2 states: 2.2 Obligation to Deliver 'Subject to the terms of the Agreement, Envestra will deliver Gas through each User DP as and when Gas is taken through that DP (whether by the Network User or the Network User's Customer or by someone else and whether the taking of that Gas is or is not specifically authorised by the Network User or any Customer of the Network User).' Envestra has requested the AER to withdraw amendment 13.1 and 13.2. Alternatively, if the AER has concerns about the drafting of these clauses, Envestra has proposed to withdraw new clauses 2.4, 2.5 and 16.6 and revert to the clause 2.2 in appendix G of its earlier access arrangement. Submissions AGL has submitted that it is unable to identify the amendments required by the AER to clauses 2.5 and 6.6. AGL has requested that the AER reviews the requirements and confirm that the appropriate amendments are reflected.[3] AER's consideration As outlined in the draft decision, the AER does not consider that Envestra has satisfactorily justified inclusion of the new clauses (clauses 2.4, 2.5 and 16.6) relating to the delivery of gas. These clauses relieve Envestra of any liability, or responsibility to make inquiries, with respect to any gas taken at a delivery point by someone other than a user. The AER does not agree with Envestra that legal effect of the clauses is the same. The AER considers that new clauses proposed by Envestra have different meaning and affect the substance of clause 2.2 in its earlier access arrangement. As submitted by AGL, the AER has reviewed the wording of clause 2.2 in its earlier access arrangement and accepts Envestra's alternative proposal to withdraw new clauses 2.4, 2.5 and 16.6 and revert to the previous clause 2.2. Envestra is required to incorporate proposed revision 13. 1.	Revision 13.1

[3] AGL, *Envestra's Qld gas network revised access arrangement proposal, Attachment A,* April 2011, pp. 2–10.

Gas specification: Other users (clause 12.5) Receipt pressures: Other users (clause 13.4)	Amendments 13.3 and 13.4.	Amendment 13.3 and 13.4 incorporated with modifications/ amendments	Amendment 13.3 of the draft decision required Envestra to amend annexure G of the access arrangement proposal by changing existing clause 12.5 to clause 12.5(a), inserting the words 'Subject to clause 12.5(b),' at the start of clause 12.5(a), and inserting new clause 12.5(b). Amendment 13.4 also required to amend annexure G of the access arrangement proposal by changing existing clause 13.4 to clause 13.4(a), inserting the words 'Subject to clause 13.4(b)', at the start of clause 13.4(a) and inserting new clause 13.4(b): New clause 12.5(b)/ 13.4(b) proposed by the AER 'Envestra will use reasonable endeavours to mitigate any loss to the Network User as a consequence of Gas being delivered into the Network that does not comply with the specifications required by the Agreement.' Envestra's response Envestra has inserted the words at 'Subject to clause' at the start of clause 12.5 and 13.4, and incorporated following new clauses 12.6 and 13.5 with modifications/ amendments in the AER proposed clauses: Clause 12.6 'If Envestra becomes aware that Gas is being delivered into the Network that does not comply with the specifications required by the Agreement then Envestra will take whatever reasonable steps it is able to take in the circumstances to prevent that Gas being delivered into the Network.' Clause 13.5 'If Envestra becomes aware that Gas is being delivered into the Network at a pressure which is outside the limits required by the Agreement then Envestra will take whatever reasonable steps it is able to take in the circumstances to prevent Gas being delivered into the Network at pressures outside those limits.' Envestra has argued that the duty to mitigate which the AER has proposed in amendments 13.3 and 13.4 is different from an obligation to prevent gas entering the network. Envestra has accepted that it is reasonable for it to have an obligation to prevent gas entering the network, in the terms described by the AER in its commentary on amendments 13.3 and 13.4. Envestra has argued that based on the AER's statement in paragraph 13.2.4.1, it is appropriate for the AER to impose a broad duty to mitigate on Envestra. A broad duty to mitigate assumes that Envestra has legal liability or responsibility for the quality or pressure of gas entering the network. The broad duty to mitigate proposed by the AER in Amendments 13.3 and 13.4 is not appropriate because it assumes that Envestra always has legal liability or responsibility for the quality or pressure of gas entering the	

			network. Envestra believes it should only have liability or responsibility where it becomes aware of a problem and fails to take reasonable steps to address that problem, to the extent that it is able to do so. This appears to have been the AER's rationale behind Amendments 13.3 and 13.4 and the new clauses proposed by Envestra accurately reflect that position. AER's consideration The AER considers that Envestra's proposed clauses 12.6 and 13.5 reflect the AER rational behind these clauses. The AER therefore accepts Envestra's proposed amendments in clauses 13.3 and 13.4.	None
Maintenance and renewal of metering equipment (clause 9.3)	Amendment 13.10	Amendment 13.10 not incorporated	Amendment 13.10 of the draft decision required Envestra to amend clause 9.3 of annexure G of the access arrangement proposal by deleting the following sentence: 'Where the Metering Equipment at a DP includes equipment for telemetry or interval metering and that equipment is no longer required by law to be used at that DP, then the Network User will bear the costs of removal of that equipment.' Envestra's response Envestra has not accepted amendment 13.9. It has confirmed that the cost of the removal of interval meters is not included in the cost of provision of reference services. The reference services, as described in Envestra's access arrangement, do not include the removal of interval meters. Envestra has submitted that the removal of interval meters has not happened frequently but, when it has been required, Envestra has invoiced the Network user for the cost of removal. As evidence it has also submitted a copy of a sample invoice. Submissions: AGL has submitted that Envestra should amends clause 9.3 to reflect the AER's consideration by deleting wording as proposed by the AER.[4] AER's consideration In the draft decision, the AER advised that when making its final decision it will reconsider this matter if Envestra provides evidence that the costs are not included in the costs recovered through reference tariffs. Envestra has now provided sample invoices confirming that the costs of removal of that equipment are not included in the costs recovered through reference tariffs and provided evidence. The AER therefore accepts Envestra's proposal not to delete the second part of clause 9.3.	None

[4] AGL, *Envestra's Qld gas network revised access arrangement proposal, Attachment A*, April 2011, pp. 2–10.

Holding over (clause 26.8)	Amendment 13.21.	Amendment 13.21 not incorporated	Amendment 13.21 of the draft decision required Envestra to amend clause 26.8 of annexure G of the access arrangement proposal by inserting after the words '(as that term is defined in the Retail Market Procedures)', the following words: 'except to the extent that the delivery of Gas is due to the negligent act or omission on the part of Envestra (or any officer, servant, agent, contractor or other person for whom Envestra is liable), Envestra's response Envestra has not incorporated amendment 13.14 and submitted that in the draft decision, the AER stated it shared the concerns (expressed by Origin and AGL) that users should not be required to pay for gas that is not required, but continues to be delivered due to the negligent act or omission of Envestra. Envestra has argued that it does not understand the AER's comments about this amendment. In practical terms, gas is delivered by Envestra when it is taken through a delivery point by the end-use consumer at that delivery point. Envestra does not do any act to deliver gas. Rather, the end-use consumer takes the gas from the network through the delivery point and Envestra cannot force gas through a delivery point, against the wishes of the end-use consumer. Envestra does not understand how, in practical terms, it can continue to deliver Gas by negligent acts or omissions. Envestra has requested the AER to explain the circumstances in which Envestra can negligently continue to deliver gas, without an end-use consumer taking that gas and consuming it. Submissions AGL has submitted that it is unable identify the amendment required by the AER to clause 26.8 and requested that the AER ensures that the amendment required in the consideration is reflected.[5] AER's consideration As outlined in the draft decision, the AER does not consider that users should continue to pay for gas that is not required, but continues to be delivered due to the negligent act or omission on the part of Envestra (or Envestra's officers, servants, agents or contractors). For example if a user has informed Envestra to stop leakage of gas in the pipeline and Envestra could not take immediate action to stop this leakage. In such cases the user should not remain responsible for gas even if the leakage of gas is due to Envestra. The AER therefore requires Envestra to amend clause 26.8 of annexure G as set out in revision 13.4.	Revision 13.4

[5] AGL, *Envestra's Qld gas network revised access arrangement proposal, Attachment A*, April 2011, pp. 2–10.

Automatic amendments (clause 38.2)	Amendment 13.23.	Amendment 13.23 not incorporated	Amendment 13.23 of the draft decision required Envestra to amend clause 38.2 of annexure G of the access arrangement proposal by deleting the words 'except to the extent that Envestra otherwise notifies the Network User' and replacing them with the words 'except as otherwise agreed between Envestra and the Network User'. Envestra's response Envestra has not incorporated the above amendment and proposed to delete this clause. Envestra submitted that its proposal to delete clause 38.2 is because of the possible impact of this clause on existing contracts which it has negotiated and made with Network Users. The effect of the existing version of clause 38.2 is that, whenever the pro forma access arrangement terms and conditions are amended, the amendments are automatically incorporated into all existing contracts that have been made between Envestra and Network Users and which incorporate the standard terms and conditions. Envestra submitted that it has entered into various contracts with Network Users that incorporate the standard terms and conditions but which are subject to special terms and conditions that have been negotiated with the Network User. Envestra proposed to change clause 38.2 because it is concerned that the clause may override the special terms and conditions that have been specifically negotiated between Envestra and Network Users. AER's consideration In view of Envestra's explanation, the AER accepts Envestra's proposal to delete clause 38.2. In the absence of clause 38.2, clause 38 (previously 38.1) will require both Envestra and Network User to agree on any amendments. This will provide certainty to both Envestra and the Network User as to the terms of their contract and ensure, for both Envestra and the Network User, that those terms can not change without agreement from both parties.	None
Part 2: Terms and conditions for which Envestra has not proposed revisions				
Maximum hourly quantity (clause 4.2)	Amendment 13.5	Amendment 13.5 not incorporated	Amendment 13.5 required Envestra to amend annexure G of the access arrangement proposal by deleting clause 4.2 proposed by Envestra. Clause 4.2 states: 'Maximum Hourly Quantity' or 'MHQ', in relation to a DP, means the maximum quantity of gas, as reasonably specified by Envestra from time to time, that Envestra agrees to deliver through that DP in any period of one hour.[6]	

[6] Envestra, *Revised Qld access arrangement terms and conditions*, March 2011, p. 3.

			Envestra's response Envestra has not accepted the above amendment. Envestra submitted that clause 4.2 provides that the maximum hourly quantity (MHQ) of gas is the maximum quantity of gas that Envestra is obliged to deliver during a period of 60 minutes. This is an existing term and condition for Envestra's South Australian network, but a new term and condition for its Queensland network. Submissions AGL has submitted that clause 4.2 should to be deleted as required by the AER.[7] AER's considerations The AER has compared the definition of MHQ in Envestra's access arrangement proposal with the proposed clause 4.2. Clause 4.2 states subject to clause 4.3. MHQ for a DP is the maximum quantity of gas which Envestra is obliged to deliver through that DP to or for the account of the Network User during any period of 60 minutes. Whereas the access arrangement proposal defines MHQ, in relation to a DP, to mean the maximum quantity of gas, as reasonably specified by Envestra from time to time, that Envestra agrees to deliver through that DP in any period of one hour. MHQ is not specified in the specific terms and conditions between the Envestra and the User. Envestra's explanation of when the MHQ is set–when the DP is designed and installed, seems at odds with the wording in the definition that Envestra can specify the MHQ from time to time. The AER has reconsidered its position and agrees with Envestra's proposal not to delete clause 4.2. However, Envestra is required to amend the definition of MHQ in its access arrangement. Definition of MHQ to be amended as: 'Maximum Hourly Quantity or MHQ means the maximum Quantity of gas (in GJ) which Envestra is obliged to transport and delivery to a particular Delivery Point on behalf of the User in any Hour (excluding Overruns).'	Revision 13.5
Gas specifications: Notice to Envestra	Amendment 13.24.	Amendment 13.24. incorporated with modifications, amendments	Amendment 13.24 of the draft decision required Envestra to amend annexure G of the access arrangement proposal by deleting the words 'to Envestra' in the heading of clause 12.4, changing existing clause 12.4 to clause 12.4(a) and inserting following new clause 12.4(b): 'Envestra will notify Network Users as soon as practicable if Envestra reasonably believes that Gas is being or may be delivered into the Network which does not meet the specifications imposed by law or specified by	

[7] AGL, *Envestra's Qld gas network revised access arrangement proposal, Attachment A*, April 2011, pp. 2–10.

(clause 12.4)			Envestra.' Envestra's response Envestra has not deleted the words 'to Envestra' in the heading to clause 12.4, changed existing clause 12.4 to clause 12.4(a) and proposed following new clause 12.4(b) : 'If Envestra becomes aware that Gas which does not meet the specifications set pursuant to clauses 12.1 and 12.2 is being or may be delivered into the Network and the Network User has not given notice to Envestra under paragraph (a) and the delivery of that Gas may have an adverse impact on the Network User or the Network User's Customers, then Envestra will notify the Network User as soon as is practicable.' AER's consideration The AER accepts the amendment proposed by Envestra as it does not affect the substance of the wording proposed by the AER. However, Envestra is required to delete the words 'to Envestra' in the heading to clause 12.4 as the notice is not only to Envestra but also to the Network Users. Envestra is required to incorporate proposed revision 13.2.	Revision 13.2
Delivery pressure (clauses 14.1 and 14.2)	Amendment 13.25	Amendment 13.25 incorporated with modifications, amendments	Amendment 13.25 of the draft decision required Envestra to amend annexure G of the access arrangement proposal by inserting the words 'and the failure is not due to the negligent act or omission on the part of Envestra (or any officer, servant, agent, contractor or other person for whom Envestra is liable)' at the end of clause 14.2. Envestra response Envestra has amended clause 14.2 by adding the following words at the end of clause 14.2 and omitted the reference to 'contractors': 'whether or not Envestra knew, or ought to have known, of those facts or matters at any time before, on or after the Start Date and the failure is not due to the negligent act or omission of Envestra (or any officer, servant, agent or other person for whom Envestra is liable).' AER's consideration The AER does not accept the amended clause as it will affect the substance of the clause 14.2 proposed by the AER and requires Envestra to incorporate the word 'contractor' after the word 'agent' and before 'other person' as set out in revision 13.3.	Revision 13.3

Liabilities Limitation period (clause 27.5) User's liabilities (clauses 27.6 and 27.7)	Amendments 13.30 and 13.31.	Amendments 13.30 and 13.31 not incorporated	Amendment 13.30 required Envestra to amend annexure G of the access arrangement proposal by deleting clause 27.6 and replacing it with following: 'To the extent permitted by law, neither party will have any liability to the other party, for or in respect of any claim (whether in tort, in contract or otherwise) for any loss of business or business interruption, loss of profit, loss of revenue or loss of opportunity, or for any other purely economic or monetary loss, or for any indirect, special or consequential loss, cost, expense or damage, which the other party may suffer or incur.' Amendment 13.31 required Envestra to amend annexure G of the access arrangement proposal by deleting clause 27.7 and replacing it with: 'To the extent permitted by law, the maximum amount that either party will be legally liable to pay to the other party (and to any other person or persons) as damages for compensation in respect of the death or any person or any injury to any person or any damage to any property will be limited to $100 million in aggregate in relation to any one event or occurrence (aggregating all damages and compensation due to the other party and each person in respect of that event or occurrence). Neither party will have any right to recover damages or compensation from the other party in relation to any claim to the extent that the other party's liability will then exceed the limit set out in this clause.' Envestra's response Envestra has not incorporated above clauses and submitted that it is superficial to extend the benefit of clauses 27.6 and 27.7 to Network Users on the basis that reciprocity is fair and reasonable. Envestra has argued that, whilst there are cogent reasons to support the inclusion of the clauses for the benefit of Envestra (as a service provider whose services are subject to regulation under the National Gas Law), the circumstances of Network Users are different to Envestra's circumstances. The reasons that justify the inclusion of the clauses for the benefit of Envestra do not apply to Network Users. Envestra has submitted that the AER proposed amendments to clauses 27.6 and 27.7 are not consistent with the principles of the National Gas Law. Envestra submitted that it is unfair for the AER to make a fundamental change to the risk allocation in Envestra's terms and conditions without giving Envestra an opportunity to adjust its reference tariffs and rate of return to reflect the change in risk allocation. Moreover, Amendments 13.29 and 13.30 take no account of the legal and commercial effect on existing contracts between Envestra and Network Users. Envestra has requested the AER to re-consider its position in relation to these amendments based on Envestra's	

			submissions. AER's consideration The AER considers that Envestra has not provided a compelling argument to justify inclusion of clauses for the benefit of Envestra in its submission. The AER does not agree that having regard to the different circumstances of Envestra and Network Users, it is reasonable for clauses 27.6 and 27.7 to operate for the benefit of Envestra, but not for the benefit of Network Users. In the draft decision, the AER considered these clauses and agreed with the Origin submission that the liabilities and indemnities are unequally weighted in favour of Envestra and that a user's liability should be capped and indirect and consequential losses excluded. The AER considers that it is reasonable for these provisions to be reciprocal. Envestra has submitted that if the amendments were made, it would be necessary for Envestra to carry business interruption insurance to cover itself against business interruption. Envestra has provided an estimate (based on insurance quote) to cover additional insurance cost proposed to be included in the opex for the forecast period.[8] The AER accepts Envestra' request to allow additional insurance cost to cover itself against business interruption (see section 8.4.7 of operating expenditure). Envestra is therefore required to amend its terms and conditions to cap a user's liability (clause 27.6) and exclude consequential loss from a user's liability (clause 27.7) as set out in proposed revision 13.6 and 13.7.	Revisions 13.6 and 13.7
Amendment to Terms and conditions	Amendment 13.41	Amendment 13.41 not incorporated	Amendment 13.41 required table 16.1 of the access arrangement information by deleting the numbers '4', '9.6', and '17' and replacing them with the numbers '2.5', '9.7' and '18' respectively in the column headed 'Old Clause Number', and by deleting the last two rows of table 16.1 Envestra's response Envestra has not incorporated amendment 13.41 in its revised access arrangement proposal and provided not reason for not doing so. AER's consideration Envestra has not provided any reason or justification for not incorporating amendment 13.41 in its revised access arrangement proposal. The AER requires Envestra to amend Table 16.1 of its revised access arrangement information as set out in revision 13.8	Revision 13.8

E. Submissions

The AER received submissions on its draft decision and Envestra's revised access arrangement proposal from the following:

- AGL Energy Limited
- Origin Energy Retail Ltd
- Jemena Limited
- Mr Kevin McMahon

Glossary

AAG	access arrangement guideline
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ACIL Tasman	ACIL Tasman Pty Ltd
AEMO	Australian Energy Market Operator
AGL	AGL Energy Ltd
APT Allgas	APT Allgas Energy Pty Limited
ASX	Australian Stock Exchange
BOM	Bureau of Meteorology
bppa	basis points per annum
CAPM	Capital Asset Pricing Model
CDI	CHESS Depository Interest
CEG	Competition Economists Group
CFC	Construction Forecasting Council
CGS	Commonwealth Government Securities
CPRS	carbon pollution reduction scheme
DNSP	distribution network service provider
DRP	debt risk premium
EBA	enterprise bargaining agreement
EBSS	efficiency benefit sharing scheme
EGW	electricity, gas and water
EMRF	Energy Market Reform Forum

Envestra	Envestra Ltd
FFM	Fama–French three factor model
FRC	full retail contestability
FTE	full time employee
GDP	gross domestic product
GFC	global financial crisis
GJ	gigajoule (1 000 000 000 joules)
HDD	heating degree day
HIA	Housing Industry Association
IPART	Independent Pricing and Regulatory Tribunal
IRR	internal rate of return
IT	information technology
KPI	key performance indicator
LME	London Metal Exchange
LRMC	long run marginal cost
MDQ	maximum daily quantity
MHQ	maximum hourly quantity
MIRN	meter installation reference number
MRP	market risk premium
MTN	medium term notes
NECF	National Energy Customer Framework
NERA	NERA Economic Consulting
NIEIR	National Institute of Economic and Industry Research
NPV	net present value

NYMEX	New York Mercantile Exchange
OESR	Office of Economic and Statistical Research
Origin	Origin Energy Retail Ltd
O&M	operating and maintenance
ORER	Office of the Renewable Energy Regulator
PJ	petajoules (equal to 1000 terajoules)
PTRM	post-taxation revenue model
QLD	Queensland
RBA	Reserve Bank of Australia
REES	Residential Energy Efficiency Scheme
RFM	roll forward model
RIN	regulatory information notice
ROLR	retailer of last resort
SA	South Australia
SEO	seasoned equity offering
SFG	Strategic Finance Group Consulting
STTM	short-term trading market
TAB	tax asset base
TJ	terajoules (equal to 1000 gigajoules)
Tribunal	Australian Competition Tribunal
UAG	unaccounted for gas
WACC	weighted average cost of capital
WAPC	weighted average price cap
Wilson Cook	Wilson Cook & Co Limited