



AusNet Transmission Group Pty Ltd

Transmission Revenue Review 2017-2022

Revised Revenue Proposal

PUBLIC

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About AusNet Services

AusNet Services is a major energy network business that owns and operates key regulated electricity transmission and electricity and gas distribution assets located in Victoria, Australia. These assets include:

- A 6,574 kilometre electricity transmission network that services all electricity consumers across Victoria;
- An electricity distribution network delivering electricity to approximately 680,000 customer connection points in an area of more than 80,000 square kilometres of eastern Victoria; and
- A gas distribution network delivering gas to approximately 572,000 customer supply points in an area of more than 60,000 square kilometres in central and western Victoria.

AusNet Services' purpose is 'to provide our customers with superior network and energy solutions.'

For more information visit: www.ausnetservices.com.au

Our AusNet Services Values are the foundation
for how we achieve our objectives



Contact

This document is the responsibility of the Regulated Energy Services division of AusNet Services. Please contact the indicated owner of the document below with any inquiries.

Charlotte Eddy
AusNet Services
Level 31, 2 Southbank Boulevard
Melbourne Victoria 3006
Ph: (03) 9695 6000

Table of Contents

Overview	4
1 Stakeholder Engagement	8
2 Maximum Allowed Revenue and Price Path.....	15
3 Capital Expenditure	23
4 Operating and Maintenance Expenditure	83
5 Depreciation	126
6 Rate of Return and Forecast Inflation.....	137
7 Tax and the Value of Imputation Credits	198
8 Incentive Schemes	214
9 Cost Pass Through	223
10 Regulatory Asset Base	234
11 Pricing Methodology and Negotiating Framework.....	243
List of Appendices	245

Overview

Introduction

On 30 October 2015 AusNet Services submitted to the Australian Energy Regulator (AER) its initial regulatory proposal (Revenue Proposal) for its electricity transmission network for the 1 April 2017 to 31 March 2022 regulatory control period. The AER published its Draft Decision on that proposal on 20 July 2016.

This document, together with supporting materials, constitutes AusNet Services' Revised Revenue Proposal for the regulatory period from 1 April 2017 to 31 March 2022. It has been prepared in accordance with version 82 of the National Electricity Rules (NER).

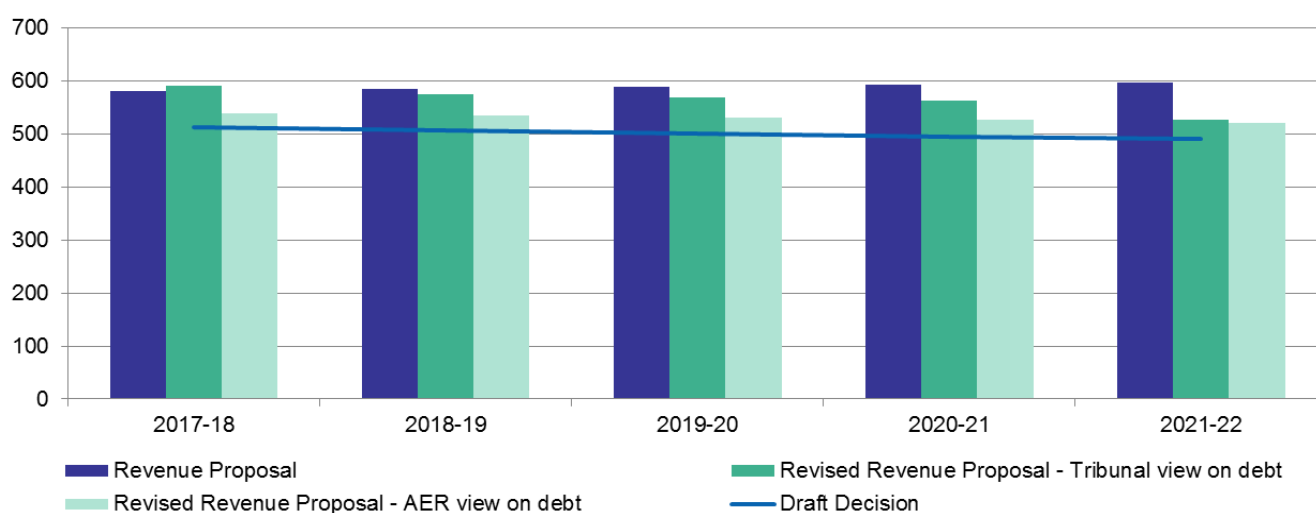
The Revised Revenue Proposal responds to issues raised in the Draft Decision and updates AusNet Services' Revenue Proposal for new information.

Importantly, AusNet Services' Revised Revenue Proposal is consistent with the priorities and the objectives set out in the Revenue Proposal and, if accepted by the AER, will continue to provide Victorian consumers with efficient and low cost transmission services.

Key Features of the Revised Revenue Proposal

The Revised Revenue Proposal sets out that AusNet Services' total revenue requirement over the 2017-22 regulatory period is \$2,967.5m (smoothed, nominal).

Figure O1: Total Revenue Requirement (\$m, real 2016-17, smoothed)



The basis for the revised forecast is explained in the remainder of this Revised Revenue Proposal and its supporting documents.

In developing this response to the Draft Decision, AusNet Services has carefully considered the matters raised by the AER.

Overall, there are many areas of agreement between the AER's Draft Decision and AusNet Services' Revised Revenue Proposal. AusNet Services has adopted the following aspects of the Draft Decision that reduce required revenues:

- Application of the AER's Guideline approach to estimating the cost of equity. This results in a reduction in proposed revenues of around \$240m compared to the Revenue Proposal. However, AusNet Services considers that an upward adjustment to the Market Risk

Premium (allowed under the Guideline) is required due to the current lowest ever interest rate environment.

- The application of straight line depreciation to network investment undertaken in the 2017-22 regulatory period. This reduces required revenues by around \$70m.
- The removal of the output growth adjustment, reducing required revenues by \$34m.
- The AER's forecast for insurance premiums and debt raising costs, reducing required revenues by \$13m.

However, there are several areas where AusNet Services considers the Draft Decision is not consistent with the NEO and the long term interests of consumers, including:

- Capital Expenditure – The AER's approach to valuing safety risk does not reflect the rigorous obligations in place to protect the safety of both employees and the general public. If implemented, the AER's approach would result in a substantial deterioration in the safety of transmission assets. The resulting change to work practices and feasible capex solutions would increase long term costs to consumers.
- Rate of Return and the Value of Imputation Credits – The allowed rate of return is not commensurate with benchmark efficient financing costs. In addition, the value of imputation credits is over-estimated. The Revised Revenue Proposal updates AusNet Services' proposed rate of return for the latest interest rate information and to reflect the Australian Competition Tribunal's February 2016 decision which sets out that efficient financing costs should reflect those that would be incurred by an unregulated entity.
- Operating Expenditure – The AER's rejection of additional costs for decommissioning assets reflect a misunderstanding about the treatment of historical decommissioning costs. AusNet Services can confirm that similar asset decommissioning costs are not embedded in its historic operating expenditure, and therefore the proposed step change is justified. Asset decommissioning is likely to become more frequent in future – it is important that efficient decommissioning costs can be recovered to maintain appropriate incentives to minimize long term costs. AusNet Services also considers the AER's approach to forecasting self-insurance costs is incorrect.
- Expected Inflation – The AER's inflation forecasting methodology does not produce realistic inflation forecasts. To allow AusNet Services to recover its efficient costs, it is imperative that the AER's approach is revised before AusNet Services' Final Decision. If the AER does not do so, its Final Decision is likely to apply de facto negative real interest rates over the coming period, contrary to observed Australian market outcomes. This clear perverse outcome will impact the level of investment AusNet Services is able to attract to efficiently invest in the network.

The Revised Revenue Proposal also differs from the Draft Decision by:

- Clarifying areas of confusion, including in relation to the safety obligations and standards that AusNet Services must comply with and the treatment of historical asset decommissioning costs.
- Responding to areas of the Draft Decision where the AER requires further information to complete its assessment of the Proposal. For example, additional supporting material for ICT capital expenditure has been provided at the AER's request, and a detailed explanation of AusNet Services' approach in choosing between alternative demand forecasts is included.
- Reflecting new information that was not available when AusNet Services' Revenue Proposal was prepared.
 - An additional major replacement project is now forecast following a recent asset fault which has led to the downgrading of the condition of particular transformers.

- Consistent with the Australian Competition Tribunal's first decision on the AER's Rate of Return Guideline, AusNet Services has adopted the Guideline approach for the cost of equity and the Tribunal's alternative (immediate) transition path for implementing the new cost of debt approach.
- Modifying the proposed approach to accelerated depreciation. The AER has applied accelerated depreciation to assets that will no longer be in service. Expected changes to the transmission network over the next decade have led AusNet Services to consider whether depreciation of additional assets should be accelerated. Accelerated depreciation of Latrobe Valley generator connection assets with a total value of \$13m is included in this Revised Revenue Proposal.

Responding to Stakeholder Concerns

In formulating this submission, AusNet Services has considered the written submissions the AER received from the Customer Challenge Panel (CCP) and other stakeholders in response to the Revenue Proposal, and matters raised at the AER's Public Forum held on 9 August 2016. It has also considered feedback received through the stakeholder engagement it has carried out since the Revenue Proposal was submitted, which includes:

- Individual discussions with the CCP and consumer advocates, particularly in relation to accelerated depreciation;
- A Public Forum held on 16 August 2016; and
- Engagement through AusNet Services' Consumer Consultative Committee (CCC).

The Revised Revenue Proposal addresses stakeholder concerns by:

- Removing the declining balance method for accelerated depreciation on all new investments. AusNet Services received very strong feedback that stakeholders did not support its short-term impact on price. The CCP expressed disappointment that AusNet Services had proposed an approach that was contrary to stakeholder feedback.
- Upholding its approach to valuing safety risk. This is critical if the safety performance of the transmission network is to be maintained. AusNet Services has discussed this topic with Energy Safe Victoria, a key stakeholder given it is responsible for regulating electricity and gas safety in Victoria, and understands that ESV will make a formal submission to the AER.
- Accepting the AER's Guideline approach to setting the return on equity, which is the preferred position of most stakeholders, although many consider that the AER's Guideline is conservative.
- Ceasing to apply an output growth escalation to operating expenditure, consistent with feedback from the Energy User Coalition of Victoria. AusNet Service agrees the increased operating costs are initially incurred and paid for outside the revenue cap.

Structure of the Revised Revenue Proposal

The remainder of this document is structured as follows:

- Chapter 1** provides an update on AusNet Services' stakeholder engagement activities, and describes how stakeholder feedback has been reflected in the Revised Revenue Proposal.
- Chapter 2** outlines AusNet Services' revised revenue requirement for the forthcoming regulatory control period, including building block components, revenue adjustments (including shared assets) and X factors.
- Chapter 3** presents AusNet Services' revised capital expenditure proposal.
- Chapter 4** presents AusNet Services' revised operating expenditure proposal.
- Chapter 5** explains AusNet Services' revised regulatory depreciation proposal.
- Chapter 6** outlines AusNet Services' proposed rate of return and forecast inflation.
- Chapter 7** outlines AusNet Services' proposed value of imputation credits and corporate tax allowance.
- Chapter 8** sets out AusNet Services' revised incentive schemes proposal.
- Chapter 9** sets out AusNet Services' revised cost pass through event proposal.
- Chapter 10** outlines AusNet Services' approach to determining the opening RAB.
- Chapter 11** presents AusNet Services' proposed pricing methodology and negotiating framework for the forthcoming regulatory control period.

The Revised Revenue Proposal has been prepared in accordance with AusNet Services' approved Cost Allocation Methodology. The expenditure forecasts are consistent with AusNet Services' capitalisation policy, which is unchanged from the current regulatory control period.

1 Stakeholder Engagement

1.1 Key Points

- In keeping with its commitment to continued and ongoing stakeholder engagement, AusNet Services undertook further stakeholder engagement following the submission of its Revenue Proposal.
- We continued to deliver a robust and low cost customer and stakeholder engagement program through:
 - One-on-one interviews with customer advocates;
 - Holding a customer advocate workshop;
 - Informal discussions with customer advocates including the Consumer Challenge Panel (CCP); and
 - Holding a joint public forum with AEMO to obtain feedback on our Revised Revenue Proposal positions.
- Many of these efforts focused explicitly on better understanding stakeholder perceptions of accelerated depreciation.
- AusNet Services has taken the learnings from its stakeholder engagement efforts into account when developing its response to the AER's Draft Decision. Areas where this has substantively impacted our Revised Proposal include:
 - Removing accelerated depreciation to new investments;
 - Accepting zero output growth in opex rate of change; and
 - Further explaining the impacts of safety assumptions in evaluating risk and forecasting capex.
- AusNet Services welcomes further feedback on its stakeholder engagement approach and looks forward to continued engagement with stakeholders as a part of its ongoing commitment to further improve its stakeholder engagement practices.

1.2 Introduction

As part of preparing its Revenue Proposal, AusNet Services undertook a consultation program to understand the views of its stakeholders on key aspects of the proposal. The program included:

- A series of stakeholder forums. Three stakeholder forums formed the core of AusNet Services' TRR engagement activities. The forums were designed to provide sequential updates on the development of the revenue proposal. They also sought stakeholder feedback at a time which would enable any feedback to be taken into account in the proposal's development. Each forum consisted of an interactive presentation and a discussion session.
- A consultation paper on accelerated depreciation. This paper provided detailed, accessible information about accelerated depreciation and invited stakeholders to make written submissions on the subject. These submissions were used to inform AusNet Services' TRR Proposal. AusNet Services received a single written submission on the consultation paper from another Transmission Network Service Provider.

Throughout, AusNet Services highlighted its availability to hold in-depth discussions with interested parties.

AusNet Services took on board all the feedback received. The Revenue Proposal clearly set out how this feedback had been considered by AusNet Services, and, where the feedback had not been adopted in the Revenue Proposal, why this was the case.

The AER was complimentary about AusNet Services' engagement program in its Draft Decision:

“Overall we consider that AusNet Services has taken important steps to engage with its customers. Stakeholders have commented that AusNet Services has made significant progress and has shown considerable goodwill in seeking consumer engagement. This is very positive. We consider that the consumer engagement undertaken by AusNet Services to date has significantly built on the engagement program undertaken in its previous revenue review.”¹

The CCP agreed that AusNet Services had made solid efforts to engage with stakeholders and showed goodwill in doing so. It also considered that there had been reasonable responsiveness to stakeholder views in its expenditure proposal. However, the CCP expressed disappointment about AusNet Services not taking on board stakeholder feedback in relation to accelerated depreciation, and also questioned the extent of AusNet Services' proactivity in seeking consumer input.²

AusNet Services has continued to build on its stakeholder engagement practices since submission of the Revenue Proposal, through:

- Undertaking more focused engagement on accelerated depreciation; and
- Establishing a Consumer Consultative Committee.

AusNet Services also provided four stakeholders with the confidential details of a proposed cost pass through event after they entered into a Confidentiality Agreement with AusNet Services. This demonstrates our willingness to transparently share information with stakeholders where it is possible to do so.

As outlined in the initial proposal, AusNet Services is committed to continuing and improving its practices when it comes to stakeholder engagement. It recognises that genuine and meaningful engagement efforts need to extend beyond that of regulatory reviews to ensure that AusNet Services manages and maintains its transmission network in a manner that promotes the long term interests of its customers.

This Chapter provides an update on stakeholder engagement that has been carried out since the Revenue Proposal was submitted. It is structured in the following way:

- Section 1.3 describes the approach taken to engaging on accelerated depreciation since submission of the Revenue Proposal;
- Section 1.4 highlights the additional engagement activities that AusNet Services has undertaken since submitting its Revenue Proposal;
- Section 1.5 explains how stakeholder feedback has been taken into account by AusNet Services to prepare its Revised Revenue Proposal;
- Section 1.6 described AusNet Services' ongoing engagement activities; and
- Section 1.7 lists the supporting documents.

¹ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016, Overview, p. 49.

² CCP, *Transmission for the Generations*, Response to AusNet Services' Revenue Proposal and AER's Issues Paper.

1.3 Engagement Approach – Accelerated Depreciation

1.3.1 Objectives

A key focus of AusNet Services' stakeholder engagement efforts since the Revenue Proposal was submitted was to better understand stakeholder views on accelerated depreciation. This was identified as an important issue to consider further given:

- Accelerated depreciation re-allocates costs between current and future consumers. It is important to understand whether this outcome is acceptable to consumers. The method of accelerated depreciation proposed in AusNet Services' Revenue Proposal represents significant changes to existing practices which will impact customers and stakeholders.
- Mixed feedback was received on the topic. Stakeholder consultation undertaken prior to the submission of its revenue proposal indicated that there was strong opposition to any form of accelerated depreciation. However, at the AER's Public Forum following submission of the Revenue Proposal (held on 19 December), a degree of support for the principle of accelerated depreciation was heard, highlighting a need for AusNet Services to conduct further research.

AusNet Services was also interested in gauging stakeholder sentiment around the different forms of accelerated depreciation as a part of these efforts.

This section describes the approach undertaken to the further consultation on accelerated depreciation carried out after submitting the Revised Proposal.

1.3.2 Stakeholder Identification

Customer and industry advocacy groups were targeted. These groups represent various end-user customers and have historically been highly engaged in regulatory determination processes. These groups were targeted because given the complexity of the topic being explored, it was decided that advocates, rather than typical end-user customers, may be better placed to productively contribute to the issues.

1.3.3 Overview of Stakeholder Engagement Activities

Following its initial submission, AusNet Services launched a range of engagement activities focusing on accelerated depreciation. These activities included:

- *Individual discussions with customer advocates.* Five face-to-face, semi-structured interviews with representatives from a diverse range of customer advocacy groups were conducted in April and May 2016. The interviews were conducted by an AusNet Services' Customer Engagement Consultant with a background in academic research thereby reducing external consultant costs. Each interview was approximately ninety minutes in duration and was conducted at AusNet Services' head office. All participants were sent a background briefing document and discussion guide prior to the interviews being conducted (see Appendix 1A – Interview background briefing) to build a base level of understanding prior to the discussion.

Topics covered during these discussions included utilisation risk, the price of electricity, intergeneration equity, and forms of depreciation.

- *Informal conversations with customer advocates.* As a part of its ongoing, business as usual, engagement processes, AusNet Services also conducted a number of informal conversations with customer advocates and industry representatives. The purpose of these conversations is to understand the areas of interest and concern in the current determination, and to follow up in further detail matters raised in written submissions provided to the AER.
- *Customer advocate workshop.* AusNet Services held a ninety minute workshop with:

- the advocates who took part in the one-on-one discussions in June 2016;
- other advocates, not previously involved in the one-on-one discussions; and
- the AER and the CCP.

The workshop was developed and facilitated by internal staff. The purpose of this workshop was to confirm and validate the aggregated findings from these initial discussions. AusNet Services also sought robust feedback on its proposed method of accelerated depreciation and other options that it was considering. Participants were sent the draft written report from the one-on-one interviews prior to this workshop to help facilitate discussion. This report was finalised following feedback received during the workshop (Appendix 1B – Engagement Overview – TRR Accelerated Depreciation).

The topics covered were consistent with those explored at the one-on-one discussions.

1.3.4 Findings from further Stakeholder Engagement on Accelerated Depreciation

Summary of stakeholder views from post-submission engagement efforts

The majority of consumer advocates did not support accelerated depreciation. They considered that customers would oppose higher short-term prices, despite the longer-term price reductions.

Form of Depreciation

AusNet Services presented the price impacts of two alternative accelerated depreciation approaches to advocates; being the declining balance and reduced asset life approaches. Many advocates considered that individual consumers would find it difficult to understand and engage with the discussion, particularly given the low materiality of the price impact of the different options. Some advocates considered that it was AusNet Services' responsibility to select the most appropriate form of accelerated depreciation to propose without having to concern customers with this. One advocate stressed that the choice of depreciation framework should be informed by accurate consumption forecasts.

When questioned about which form of depreciation they believed might be most acceptable to consumers, most advocates did not provide a clear position. However, when explained that the approach proposed by AusNet Services in its Revenue Proposal would cost residential consumers less than \$7 extra a year, some were supportive. In fact, one advocate indicated that the price increase was so small that '*it is not worth even communicating with customers*'. It was the advocates' perception that a \$7 increase in bills would not have a detrimental impact on even vulnerable customers. However, one advocate flagged that although the size of the price increase is merely '*noise*', it is important that the rationale underpinning this price increase is sound.

Application of Accelerated Depreciation to Different Assets

Views on which assets it would be most appropriate to accelerate the depreciation of were mixed. For example, two advocates thought that it was more justifiable to apply accelerated depreciation to specific assets, especially new assets which may be utilised less into the future. Another, however, suggested that AusNet Services should apply accelerated depreciation across all assets to avoid criticism of cherry picking.

Views on whether accelerated depreciation would be most appropriately applied to existing or new assets were also mixed. Some advocates suggested that the existing asset base should not be touched, as consumers should not pay for additional costs they were not expecting to pay. Other advocates suggested targeting existing assets that were most likely not to be required in future (such as the Latrobe Valley 500kV lines) was most appropriate.

One advocate suggested that AusNet Services requires more reliable, locational specific data to underpin its depreciation proposal. Monte Carlo analysis could then be applied to determine expected utilisation patterns and quantify the risk if straight line depreciation were maintained.

1.4 Additional Engagement Activities

The following broader engagement activities have been carried out in preparing the Revised Revenue Proposal.

- *Joint AEMO and AusNet Services' forum.* A joint forum was held with various customer advocates and industry representatives on 16 August 2016. The purpose of this forum was to seek feedback on proposed positions in response to the AER's Draft Decision. A summary of the forum is attached (Appendix 1C – Revised Revenue Proposal 16 August Stakeholder Forum Summary), and feedback received at the forum is identified and responded to throughout this Revised Revenue Proposal.
- AusNet Services' Customer Consultative Committee (CCC). In June 2016, AusNet Services launched its CCC. The purpose of the CCC is to gain actionable customer insights to inform decision making and execution of strategy. The scope of the Committee covers AusNet Services' three regulated networks.
- The CCC is not a decision-making body but plays an important advisory, 'sounding board' role to AusNet Services, reporting through to management. This means that, where applicable, it is critical that management is held accountable for either reflecting advice provided by the Committee in its decision-making, or justifying any decisions to disregard its advice.
- The establishment of a CCC provides an ongoing forum in which a range of customer issues can be discussed by a select group of community or customer representatives, often people with expert knowledge about specific and general consumer issues.
- Membership of the Committee comprises of seven AusNet Services' representatives, including the Managing Director and eleven external representatives from a range of customer interests and community groups. External membership of the Committee collectively represents a cross-section of AusNet Services' customers (i.e., recipients of our services and/or are connected to our electricity transmission network, or electricity and gas distribution networks). To best reflect a range of ideas and opinions of a representative customer group, at least one representative from one or more of the following customer segments are represented on the Committee:
 - Residential customer;
 - Small-to-medium business;
 - Large industrial and commercial business;
 - Rural customer;
 - Vulnerable or disadvantaged customer;
 - Solar and alternative technologies; and
 - Local council.
- Members were briefed on AusNet Services' intended response to the AER's Draft Decision.

1.5 Role of Stakeholder Feedback in preparing the Revised Revenue Proposal

AusNet Services prepared its Revised Revenue Proposal with stakeholder feedback in mind. The stakeholder feedback received and how it has been addressed is explained in detail in the relevant chapters. Consistent with the approach taken in the Revenue Proposal, where stakeholder feedback has not been reflected in the submission, we have explained why.

A summary of stakeholder feedback, and how it has been addressed, is provided in the Table below.

Table 1.1: Summary of Stakeholder Feedback

Revenue Component	Feedback Received	How Feedback has been Incorporated in the Revised Revenue Proposal
Capital Expenditure	<p>Stakeholders were interested in more detail around AusNet Services' approach to quantifying safety risk.</p> <p>Stakeholders asked whether the approach to valuing safety risk was tightly specified by Victorian legislation.</p> <p>A stakeholder expressed concern that AusNet Services' Regulated Asset Base (RAB) was forecast to continue to grow over the 2017-22 regulatory period.</p>	<p>A full explanation on AusNet Services' approach to valuing safety risk and its legislative obligations is included in the Revised Revenue Proposal.</p> <p>AusNet Services' proposal would result in a declining RAB (in real terms) over the 2017-22 regulatory period.</p>
Operating Expenditure	<p>Opposed addition opex to account for network growth as this would not match the imposition of costs under the Victorian transmission planning arrangements.</p> <p>Considered that decommissioning the synchronous condensers should be funded through the depreciation allowance, not through additional opex.</p> <p>Supported the additional funding for Smart Aerial Image Processing (SAIP), due to the potential to reduce future expenditure.</p>	<p>Additional opex for output growth is no longer included in AusNet Services' Revised Revenue Proposal.</p> <p>Provides additional detail to support the proposed one-off increase in opex to decommission the synchronous condensers, and explains why this is the appropriate funding mechanism under the regulatory framework.</p> <p>Continues to propose additional expenditure for SAIP.</p>
Rate of Return	<p>Support the AER's Guideline approach, but consider it to be conservative.</p>	<p>AusNet Services has adopted the AER's Guideline approach to determine the cost of equity.</p>
Depreciation	<p>Oppose the application of declining balance depreciation to new investment.</p>	<p>The Revised Revenue Proposal does not apply declining balance depreciation to new investments.</p>
Incentive Schemes	<p>Did not support the proposed adjustment to incentive scheme targets due to a decline in the Value of Customer Reliability.</p>	<p>AusNet Services no longer proposes an adjustment to its incentive scheme targets are made on this basis.</p>

1.6 Ongoing Engagement

AusNet Services' Revenue Proposal comprehensively outlines how it intends to engage with stakeholders in an ongoing manner. Specifically, we recognise that for the transmission business, stakeholder engagement must continue to grow beyond that undertaken for regulatory proposals and major capital projects to date.

As such, AusNet Services is in the process of developing a business-wide customer and stakeholder engagement mode that includes policies, approaches and processes. The business is committed to building the strengths it needs to implement broad-based business as usual engagement across the business.

For transmission network stakeholders, AusNet Services is committed to continuing stakeholder engagement through the following ongoing activities:

- Improving the information that is available and easily accessible to customers and stakeholders through the launch of its new customer-centric website;
- Review key learnings from the efforts to date. AusNet Services will conduct an internal workshop with those involved in the program to evaluate the efforts described in this report and discuss areas of improvement for future engagement; and
- Continued consultation with key stakeholders through activities such as presentations and workshops tailored specifically to the information needs and expertise of those groups.

1.7 Supporting Documents

The following appendices are relevant to this chapter:

- Appendix 1A – Accelerated Depreciation: Background Briefing Document
- Appendix 1B – Engagement Overview – TRR Accelerated Depreciation
- Appendix 1C – Revised Revenue Proposal 16 August Stakeholder Forum Summary

2 Maximum Allowed Revenue and Price Path

This chapter sets out AusNet Services' response to the Australian Energy Regulator's (AER's) Draft Decision with respect to revenue as set out in Attachment 1 – Maximum allowed revenue. AusNet Services' initial positions were set out in Chapter 13 – Maximum allowed revenue and price path of the Revenue Proposal.

In the event of inconsistency between information contained in this chapter and AusNet Services' Revenue Proposal, the information contained in this chapter prevails.

2.1 Introduction

The AER determined a total annual building block revenue requirement for AusNet Services of \$2,694.3 million (nominal) for the 2017-22 regulatory control period, representing a reduction of \$463.3 million (nominal) or 14.7 percent to AusNet Services' Revenue Proposal.

The major reductions to AusNet Services' prescribed transmission services revenue building blocks proposal included:

- The return on capital allowance reduced by 16.8%;
- The regulatory depreciation allowance reduced by 13.5%;
- The capital expenditure (capex) allowance reduced by 23.1%;
- The operating expenditure allowance reduced by 6.1%; and
- The cost of corporate income tax allowance reduced by 14.7%.

AusNet Services' Revised Revenue Proposal revenues are affected by its positions on inputs and approaches to the regulatory building blocks.

A summary of key building block positions within the Revised Proposal is provided below. AusNet Services:

- Proposes to continue to apply straight-line depreciation to its existing asset base and assets to be commissioned in the 2017-22 regulatory period;
- Accepts the AER's Draft Decision to accelerate the depreciation of assets that are to be decommissioned in the current or forthcoming regulatory period;
- Proposes accelerated depreciation to other selected network assets that are no longer expected to be required in the long-term due to changes in Victoria's generation mix;
- Accepts the AER's Draft Decision on AusNet Services proposed Shared Assets revenue adjustments for the 2017-22 period;
- Accepts some aspects of the Draft Decision on capex including the application of updated demand forecasts and the AER's approach to forecasting capitalised overheads;
- Does not accept the AER's approach to valuing safety risk to determine the economic timing of capital expenditure projects, or the AER's approach to account for cost estimation bias;
- Accepts some aspects of the Draft Decision on operating expenditure including:
 - the AER's base year opex, with the exception of a required adjustment for self-insurance;
 - the AER's approach to forecasting insurance costs and debt raising costs;
 - the AER's methodology for determining the rate of change, but does not accept the AER's real price change or productivity change inputs;

- the AER’s forecast of opex attributable to the roll in of Group 3 assets, subject to an adjustment for the Revised Revenue Proposal’s base year.
- Does not accept the AER’s approach to forecasting self-insurance costs or its decision on opex step changes;
- Accepts the AER’s Guideline approach to estimating the cost of equity;
- Does not accept the AER’s estimate for the value of imputation credits (gamma) of 0.40, instead proposing a value of 0.25;
- Does not apply the AER’s Draft Decision of the allowed return on debt for the 2017-22 period and instead adopts an immediate transition to the trailing average approach for calculating the cost of debt; and
- Does not accept the AER’s estimate of forecast inflation for the 2017-22 period of 2.44%, instead proposing a placeholder of 1.65% using a market based estimate.

Having regard to the above changes, AusNet Services proposes total revenue for the 2017-22 period of \$2,966.7 million (nominal unsmoothed). The revised revenue requirement is 10.1% higher than the Draft Decision and 6.0% lower than the Revenue Proposal.

The remainder of this chapter is structured as follows:

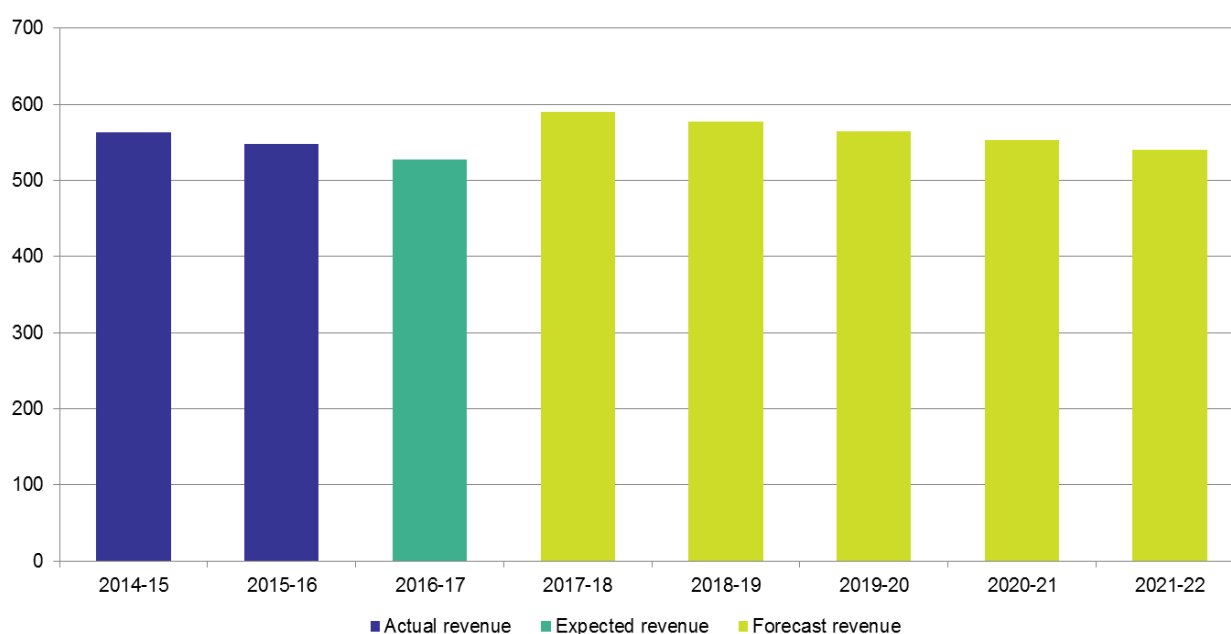
- Section 2.2 outlines AusNet Services’ Revised Revenue Proposal for the 2017-22 period; and
- Section 2.3 outlines AusNet Services’ revised proposed Shared Assets Revenue Adjustment for the 2017-22 period.

2.2 Revised Revenue Proposal

2.2.1 Summary of AusNet Services’ Revenue Requirement

Based on the detailed inputs described and calculated in this Revised Revenue Proposal, AusNet Services’ smoothed revenue requirement comprises an average of \$565.3 million per annum (real \$2016-17) in the 2017-22 regulatory period.

Figure 2.1: Revenue 2014-15 to 2021-22 (\$m, real 2016-17)



2.2.2 Annual building block revenue requirement

The annual building block revenue requirement for each year of the period is calculated (in accordance with NER 6A.5.4) as the sum of the building blocks. The Table below presents a summary of the building blocks and the annual building block revenue requirement.

Table 2.1: Annual building block revenue requirement from 1 April 2017 to 31 March 2022 (\$m, nominal)

	2017/18	2018/19	2019/20	2020/21	2021/22	Total
Return on Capital	\$235.9	\$233.9	\$225.1	\$218.5	\$213.2	\$1,126.5
Regulatory Depreciation	\$120.8	\$123.0	\$130.3	\$133.5	\$116.7	\$624.2
Operating Expenditure	\$219.2	\$216.6	\$220.6	\$225.4	\$229.2	\$1,111.0
Revenue Adjustments*	-\$0.2	-\$0.2	-\$0.3	-\$1.8	-\$5.2	-\$7.7
Net Tax Allowance	\$24.7	\$21.1	\$23.1	\$25.1	\$18.6	\$112.6
Annual building block revenue requirement (unsmoothed)	\$600.4	\$594.3	\$598.8	\$600.7	\$572.5	\$2,966.7

Source: AusNet Services' Revised Proposal PTRM.

* This refers to adjustments for the EBSS and shared assets.

The unsmoothed annual revenue requirement is calculated as the sum of the building block components, which are described in the sections below, and detailed in the Chapters that follow.

Regulatory Asset Base

AusNet Services' forecast RAB for the forthcoming regulatory control period is set out in the Table below. It reflects the capital expenditure forecast set out in Chapter 3 of the Revised Revenue Proposal and the forecast depreciation over the period, as described in Chapter 5. It also reflects the establishment of the opening RAB as at 1 April 2017 as described in Chapter 10.

Table 2.2: Regulatory asset base (As Incurred) 1 April 2017 to 31 March 2022 (\$m, nominal)

	2017/18	2018/19	2019/20	2020/21	2021/22
Opening RAB	\$3,181.2	\$3,249.4	\$3,297.7	\$3,333.7	\$3,350.1
Net Capital expenditure	\$188.9	\$171.2	\$166.3	\$149.9	\$129.3
Opening RAB inflation addition	\$52.5	\$53.6	\$54.4	\$55.0	\$55.3
Nominal Straight-line depreciation	-\$173.2	-\$176.6	-\$184.7	-\$188.5	-\$172.0
Closing RAB	\$3,249.4	\$3,297.7	\$3,333.7	\$3,350.1	\$3,362.7

Source: AusNet Services' Revised Proposal PTRM.

Return on Capital

Details of the WACC for revenue calculation purposes are set out in Chapter 6 of this Revised Revenue Proposal. The return on capital has been calculated by applying the post-tax nominal vanilla WACC to the regulatory asset base in accordance with the AER's Post Tax Revenue Model (PTRM). This calculation is shown in the Table below.

Table 2.3: Return on Capital from 1 April 2017 to 31 March 2022 (\$m, nominal)

	2017/18	2018/19	2019/20	2020/21	2021/22
Opening RAB	\$3,181.2	\$3,249.4	\$3,297.7	\$3,333.7	\$3,350.1
WACC (percent per annum)	6.39%	6.23%	5.94%	5.73%	5.58%
Return on capital	\$235.9	\$233.9	\$225.1	\$218.5	\$213.2

Source: AusNet Services' Revised Proposal PTRM.

Depreciation

The calculation of AusNet Services' proposed depreciation allowance is detailed in Chapter 5 of this Revised Revenue Proposal. The AER's PTRM calculates economic depreciation by subtracting the indexation of the opening asset base from the nominal depreciation for each regulatory year. A summary of this calculation is shown in the Table below.

Table 2.4: Economic Depreciation from 1 April 2017 to 31 March 2022 (\$m, nominal)

	2017/18	2018/19	2019/20	2020/21	2021/22
Nominal Straight-line depreciation	\$173.2	\$176.6	\$184.7	\$188.5	\$172.0
Less: indexation on opening RAB	-\$52.5	-\$53.6	-\$54.4	-\$55.0	-\$55.3
Regulatory depreciation	\$120.8	\$123.0	\$130.3	\$133.5	\$116.7

Source: AusNet Services' Revised Proposal PTRM.

Operating and Maintenance Expenditure

The derivation of AusNet Services' operating and maintenance expenditure (opex) forecast is set out in Chapter 4 of this Revised Revenue Proposal. The total opex forecast including controllable opex, self-insurance, and easement land tax.

Table 2.5: Opex forecast from 1 April 2017 to 31 March 2022 (\$m, nominal)

	2017/18	2018/19	2019/20	2020/21	2021/22
Controllable Opex	\$100.2	\$95.7	\$97.6	\$100.5	\$102.2
Self-insurance	\$2.8	\$2.8	\$2.8	\$2.9	\$2.9
Sub-total	\$103.0	\$98.5	\$100.5	\$103.4	\$105.1
Easement Land Tax	\$116.2	\$118.1	\$120.1	\$122.0	\$124.1
Total	\$219.2	\$216.6	\$220.6	\$225.4	\$229.2

Source: AusNet Services' Revised Proposal PTRM.

Efficiency Benefit Sharing Scheme

The Table below sets out the payments arising from the operation of the EBSS revenue during the current regulatory period. The positive amounts shown indicate bonuses to be included in the building block calculation as a result of efficiency gains achieved.

Table 2.6: Incentive scheme payments from 1 April 2017 to 31 March 2022 (\$m, real 2016-17)

	2017/18	2018/19	2019/20	2020/21	2021/22
EBSS	\$1.3	\$1.3	\$1.3	-	-\$3.0

Source: AusNet Services Revised Proposal PTRM.

Estimated Cost of Corporate Tax

The calculation of estimated corporate income tax is detailed in Chapter 7 of this Revised Proposal. The estimated tax allowance is shown in the Table below.

Table 2.7: Estimated Cost of Corporate Tax from 1 April 2017 to 31 March 2022 (\$m, nominal)

	2017/18	2018/19	2019/20	2020/21	2021/22
Tax payable	\$32.9	\$28.1	\$30.9	\$33.4	\$24.8
Less value of imputation credits	-\$8.2	-\$7.0	-\$7.7	-\$8.4	-\$6.2
Net corporate income tax allowance	\$24.7	\$21.1	\$23.1	\$25.1	\$18.6

Source: AusNet Services' Revised Proposal PTRM.

2.2.3 Maximum allowed revenue, X factor and revenue cap

Pursuant to NER 6A.5.3(c) and 6A.6.8, the annual building block revenue requirement is converted into a maximum allowed revenue in order for the revenue cap to be implemented. The revenue cap proposed by AusNet Services is:

- For the year ending 31 March 2018, \$600.4 million (nominal); and
- For the years ending 31 March 2019 to 2022, escalated according to a constant X factor of 2.19%, that is, a negative real price path.

The maximum allowed revenue for the year ending 31 March 2018, and the X factor chosen ensures a smooth transition (in terms of total revenue) from the current period, and accords with the requirements of the NER in that it meets the following criteria:

- The maximum allowed revenue in the last year (the year ending 31 March 2022) is within 3.0% per cent of the annual building block revenue requirement for that year, in accordance with NER 6A.6.8(c)(2); and
- The total building block revenue and the total maximum allowed revenue for the regulatory control period (that is, the total revenue cap) are equal in NPV terms, in accordance with NER 6A.5.3(c)(1).

The Table below shows the annual building block revenue requirement, the maximum allowed revenue and the total revenue cap for the forthcoming regulatory control period.

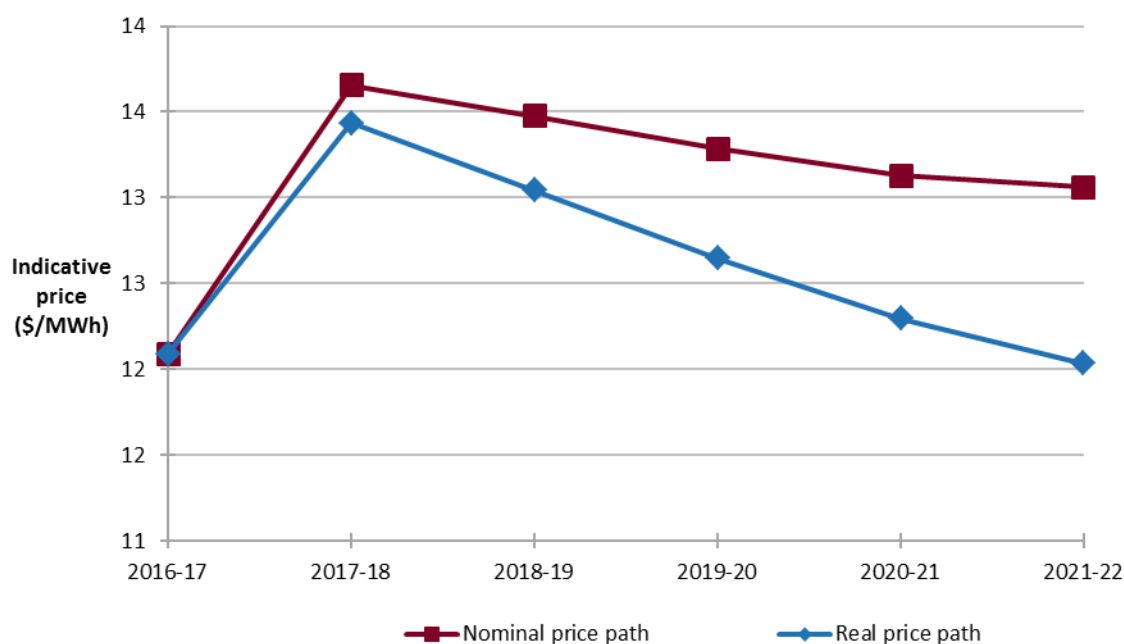
Table 2.8: Annual building block revenue, X factors and maximum allowed revenue from 1 April 2017 to 31 March 2022 (\$m, nominal)

	2017/18	2018/19	2019/20	2020/21	2021/22	Total
Annual building block revenue requirement (unsmoothed)	\$600.4	\$594.3	\$598.8	\$600.7	\$572.5	\$2,966.7
Annual expected MAR (smoothed)	\$600.4	\$596.9	\$593.5	\$590.1	\$586.7	\$2,967.5
X factor (per cent)	-11.84%	2.19%	2.19%	2.19%	2.19%	n/a

Source: AusNet Services' Revised Proposal PTRM

2.2.4 Average Price Path under the Proposed Revenue Cap

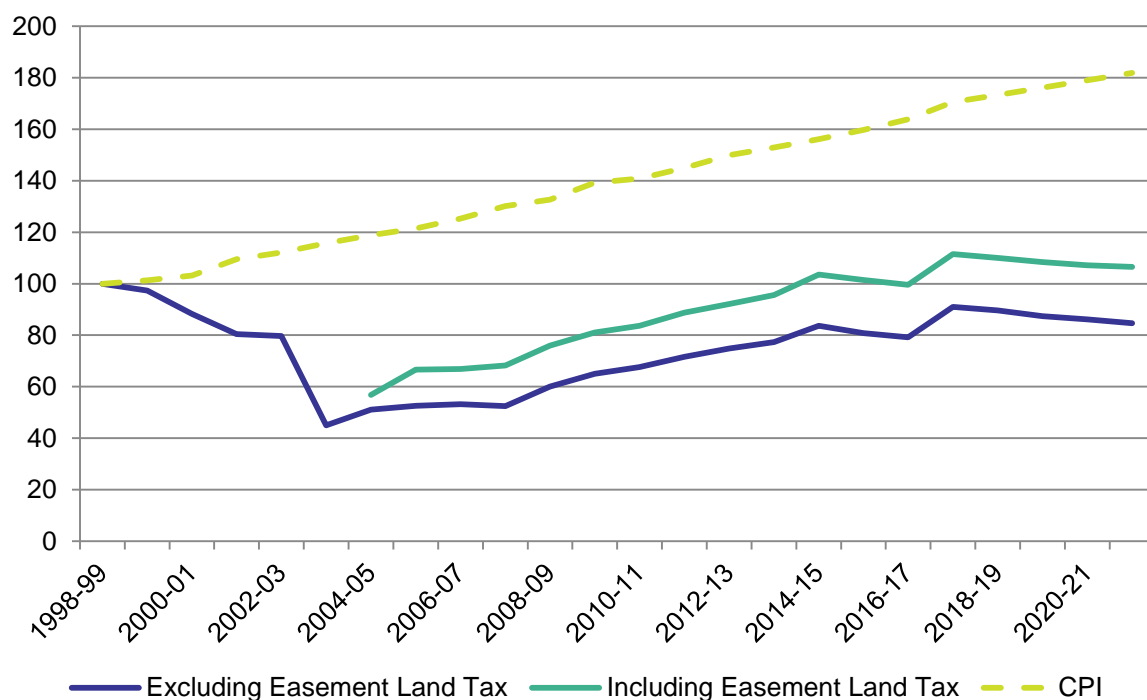
Prices are forecast to increase in real terms by 11.84% in 2017/18 and decrease by 2.19% each year after to the end of the regulatory period in March 2022. The Figure below shows the forecast price path for the forthcoming regulatory control period.

Figure 2.2: Future Price Path for AusNet Services (\$/MWh)

Source: AusNet Services' Revised Proposal PTRM

The revenue path proposed by AusNet Services will continue to deliver low average transmission charges for Victoria and ensure that those charges remain lower than most current transmission charges in the NEM, as shown in the Figure below.

Figure 2.3: Historical price path: Victorian transmission (index)



Source: AusNet Services Revised Proposal PTRM, AusNet Services analysis.

2.3 Shared Assets Revenue Adjustment

In its Revenue Proposal AusNet Services applied the AER's Shared Assets Guideline approach to determine the appropriate shared assets revenue decrement for the 2017-22 period. AusNet Services' proposed revenue decrement equals 10% of its forecast shared asset unregulated revenues for the 2017-22 period, subject to a materiality threshold.

AusNet Services' initial proposed shared asset cost reduction for the 2017-22 period is set out in the Table below.

Table 2.9: AusNet Services' Initial Proposed Shared Asset Revenue Adjustment (\$m, 2016/17)

\$m, real \$2016/17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Proposed shared assets revenue decrement	-\$1.5	-\$1.6	-\$1.6	-\$1.7	-\$1.7	-\$8.1

Source: AusNet Services' Initial Revenue Proposal, Chapter 6 – Shared Assets

With respect to AusNet Services' forecast of shared asset unregulated revenues the AER stated in its Draft Decision that:

*"We consider AusNet Services' forecasts are reasonable, based on its reporting of historical shared assets revenue and our assessment of this revenue source for other service providers."*³

Based on AusNet Services' initial forecast total annual revenue requirement for the 2017-22 period the materiality threshold included in the Shared Asset Guideline was satisfied in each

³ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 1 – Maximum allowed revenue, p. 19.

year. Accordingly, the AER has accepted AusNet Services' proposed shared asset revenue decrement in its Draft Decision.⁴

Response to Draft Decision

AusNet Services accepts the Draft Decision on its proposed shared assets revenue adjustment, being a total of \$8.1 million (real \$2016-17) for the 2017-22 regulatory period.

Based on AusNet Services' revised forecast total annual revenue requirement AusNet Services' unregulated use of shared assets continues to be material in all years of the regulatory control period. The results of the materiality assessment are shown in the Table below.

Table 2.10: Materiality Assessment Outcome (\$m, real 2016/17)

\$m, real \$2016/17	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Proposed smoothed ARR	\$592.1	\$579.2	\$566.7	\$554.4	\$542.3	\$2,834.7
Average Annual SAUR	\$16.1	\$16.1	\$16.1	\$16.1	\$16.1	\$80.7
SAUR as % of ARR	2.7%	2.8%	2.8%	2.9%	3.0%	2.8%
Material?	Y	Y	Y	Y	Y	N/A

⁴ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 1 – Maximum allowed revenue, p. 19.

3 Capital Expenditure

This chapter sets out AusNet Services' response to the Australian Energy Regulator's (AER's) Draft Decision with respect to capital expenditure as set out in Attachment 6 of the Draft Decision. AusNet Services' initial capital expenditure forecasts were set out in Chapter 4 of the Revenue Proposal.

In the event of inconsistency between information contained in this chapter and AusNet Services' Revenue Proposal, the information contained in this chapter prevails.

3.1 Key Points

- AusNet Services has not adopted the AER's approach to valuing safety risk. It considers that its current approach leads to targeted replacement of the most risky assets to the degree required by safety obligations, while allowing low and flat transmission prices to be maintained.
- Any reduction on the value applied to safety risk would, if adopted by AusNet Services, make the transmission system less safe for both AusNet Services' workforce and the general public. This is contrary to the requirements of the NER.
- Since submitting its Revenue Proposal, an explosive failure has occurred on AusNet Services network. The risk of explosive failures is a real, not a theoretical risk.
- Following the AER's concerns about AusNet Services' safety risk assessment approach, AusNet Services is committed to reviewing its approach to valuing safety risk before the next regulatory review. However, the evidence presented in this Chapter demonstrates that the conclusions of this review would not support a material decline in costed safety risk.
- AusNet Services accepts the use of updated demand forecasts, and considers that both summer and winter forecasts should be updated. It does not accept the automatic application of AEMO's forecasts, and has provided more information on its principles-based approach to applying demand forecasts.
- Since submitting its Revenue Proposal, a need to undertake an additional major replacement project at East Rowville Terminal Station has arisen following a transformer fault.
- AusNet Services does not accept the AER's approach to calculating a cost estimation bias, and proposes its own which is statistically more robust.
- AusNet Services has provided additional information on its transmission-specific ICT capex programs, as requested by the AER.
- The AER's approach to calculating capitalised overheads has been applied, and the forecast for overheads has been scaled to reflect the Revised Revenue Proposal capex forecast.

3.2 Summary

3.2.1 Draft Decision

The Draft Decision approved \$573.1m of \$745.6m (real, \$2016-17) of capital expenditure (capex), a reduction of \$172.5m, or 23% from the capex forecast in AusNet Services' Revenue Proposal.

The AER arrived at a lower network capex forecast by adjusting key assumptions underpinning AusNet Services' economic project assessments. The major drivers of the difference between the Revenue Proposal and the Draft Decision are:

- Reduction related to estimated safety risks (\$99.0m);
- Reduction related to estimated reliability risk, driven by applying updated demand forecasts and adopting AEMO's 2015 Transmission Connection Point Forecast (TCPF) (\$44.1m);
- Reductions in project cost estimates to account for cost estimation bias (\$13.5m);
- Reduction due to updating CPI (\$13.3m); and
- Reduction in non-network ICT expenditure (\$4.6m), where no supporting information has been provided.

The Table below compares the Revenue Proposal and the Draft Decision capex forecasts by category.

Table 3.1: Revenue Proposal and Draft Decision Capex Forecasts (\$m, real 2016-17)

Category	Revenue Proposal	Draft Decision	Difference (%)
CBD station rebuilds	119.1	72.1	-39%
Major stations replacement	192.8	111.0	-42%
Asset replacement programs	250.6	221.8	-11%
Safety, security and compliance	71.6	63.4	-11%
Non-network	111.5	104.8	-6%
Total	745.6	573.1	-23%

3.2.2 Revised Revenue Proposal

While AusNet Services accepts some aspects of the Draft Decision, such as the AER's use of up to date demand forecasts, AusNet Services is concerned about the AER's approach to adjusting its safety risk assessment. It can be demonstrated that the approach adopted by AusNet Services produces appropriate outcomes, as shown by the age and condition of the assets currently proposed to be replaced, and is consistent with the NEO and the revenue and pricing principles. In particular, AusNet Services' approach allows it to satisfy regulatory requirements imposed by Australia's occupational health and safety legislation, as well as electricity industry regulations, the primary objective of which is to deliver electricity safely.

Following the AER's concerns about AusNet Services' safety risk assessment approach, AusNet Services is committed to reviewing its approach to costing safety risk before the next regulatory review. It is anticipated that this would result in an outcome materially similar to the approach currently adopted. However, due to the importance and complexity of this exercise, it has not been possible to undertake this exercise in the timeframe available to prepare the Revised Revenue Proposal. Nonetheless, AusNet Services is satisfied that, as an overall package, its current assessment approach does not inflate safety risk beyond the levels required by legislation. Therefore, AusNet Services does not consider that variations to its replacement program on this basis are warranted.

If the value of costed safety risk were lowered, deferring projects, it would not allow AusNet Services to meet its legal obligations for the safety of its workforce and the general public. It would make on-site (brownfield) replacements infeasible, and therefore, necessitate more expensive options (such as greenfield replacements), increasing the long term cost to customers.

In summary, AusNet Services' Revised Revenue Proposal accepts:

- The application of updated demand forecasts;
- The Draft Decision on the major replacement projects at Ringwood and Heywood terminal stations; and
- The AER's approach to forecasting capitalised overheads.

AusNet Services does not accept:

- The AER's approach to quantifying safety risk; and
- The AER's approach to account for cost estimation bias.

Further information is provided in relation to:

- Our approach to selecting demand forecasts; and
- Non-network ICT expenditure; and

The remainder of this chapter is structured as follows:

- Section 3.3 outlines the AER's assessment approach;
- Section 3.4 describes the AER's adjustment to AusNet Services' safety risk quantification and AusNet Services' response to this adjustment;
- Section 3.5 sets out the AER's application of demand forecasts and AusNet Services' response;
- Section 3.6 describes the AER's adjustment to the expenditure forecast due to cost estimation bias and outlines AusNet Services' response;
- Section 3.7 describes the additional major expenditure that is required following new information that has arisen since submission of the Revenue Proposal;
- Section 3.8 outlines the Draft Decision on non-network capex and AusNet Services' response;
- Section 3.9 outlines the Draft Decision on capitalised overheads and AusNet Services' response;
- Section 3.10 addresses other matters raised by the AER in the Draft Decision;
- Section 3.11 describes how stakeholder feedback has been taken into account in developing the Revised Revenue Proposal;
- Section 3.12 sets out the Revised Revenue Proposal capex forecast; and
- Section 3.13 lists the supporting documents that are relevant to this Chapter.

As no augmentation is included in plan, AEMO's National Transmission Network Development Plan is not directly relevant to this Revised Revenue Proposal. However, AusNet Services and AEMO work together to integrate replacement and augmentation projects for the Victorian transmission network, to ensure that any potential cost efficiencies are achieved.

3.3 AER's Capex Assessment Approach

This section describes the approach the AER has taken in reaching its overall capex forecast and our concern that the AER has relied heavily on a single technique in reaching its Draft Decision.

In its Expenditure Forecast Assessment Guideline, the AER states that:

“When we assess capex and opex forecasts, we will use a number of assessment techniques to form a view on the reasonableness of the forecast.”⁵

While the Draft Decision discusses a number of techniques, the AER has exclusively relied upon its assessment of key inputs into AusNet Services’ forecasting methodology to:

- Conclude that AusNet Services’ capex forecast is inflated; and
- Derive a substitute capex forecast.

Despite a number of other assessment techniques supporting the capex forecast included in AusNet Services’ Revenue Proposal, and not supporting the AER’s substitute capex forecast, the AER has not given any weight to these other techniques.

The evidence supporting each of the other techniques discussed in the Draft Decision and the conclusions the AER has drawn from these are described in the Table below.

Table 3.2: AER’s Assessment Approach

Technique	Evidence	AER’s Conclusions
Economic benchmarking	The multilateral total factor productivity analysis published by the AER indicates that AusNet Services’ productivity has remained steady over time and is closely aligned to the industry average. ⁶	2014-15 capex is not inefficient. AusNet Services’ cost efficiency is aligned with the industry average. No concerns are expressed by the AER regarding AusNet Services’ efficiency on the basis of its economic benchmarking analysis.
Historical capex performance	A decline in total capex is forecast, driven by a reduction in major stations replacement projects. This has contributed to a small increase in forecast program expenditure.	The Draft Decision includes some discussion on forecast capex compared to historical trends, but it does not present any conclusions based on this evidence.
Forecasting methodology review	The AER undertook a thorough review of AusNet Services’ asset management practices focussed on its major project justifications, which incorporate assumptions on safety risk and demand forecasts. It also looked at historical project cost outturns compared to estimated P50 costs.	The AER concluded that AusNet Services’ forecasting methodology adopts a risk based economic planning approach which reflects good industry practice ⁷ . However, the AER has adjusted key assumptions applied in AusNet Services’ economic evaluations for replacement based on a perceived overestimation of safety risk, using updated demand forecasts, and applied a project cost estimation bias adjustment.
Predictive modelling	The AER only applied predictive modelling for SCADA and network protection assets, given the suitability of these assets for repx modelling.	The results validated AusNet Services’ Revenue Proposal forecast for this capex category. The AER expressed concerns about this technique due to inconsistency with its own findings in relation to safety risk and project cost estimation ⁸ . It therefore did not consider that the repx modelling output was

⁵ AER, *Expenditure Forecast Assessment Guideline*, p. 12.

⁶ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 22.

⁷ Ibid.

⁸ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 58.

Technique	Evidence	AER's Conclusions
		valid.
Network health indicators	<p>Risk assessment by asset type – AusNet Services provided a risk assessment summary by asset type of the expected impact of its capex forecast on risk. This found that the capex forecast maintains risk for all asset classes except for conductors, for which risk would marginally increase in risk, and towers, for which risk would be reduced.</p> <p>Asset age profile – this data confirms a significant proportion of substation switchbays are in service beyond their estimated mean economic lives. Data suggests the health of AusNet Services' asset base may be expected to deteriorate for conductors, substation and transformer assets and underground assets.</p>	<p>The AER concluded that, as it did not support the AER's own findings in relation to the forecasting methodology, that AusNet Services' risk assessment analysis must be invalid.</p> <p>The AER dismissed its own asset age profile analysis as large volumes of recent replacements can lead to an increase in residual service lives. However, this is not relevant here as the residual service lives of AusNet Services' asset categories are reducing.</p>

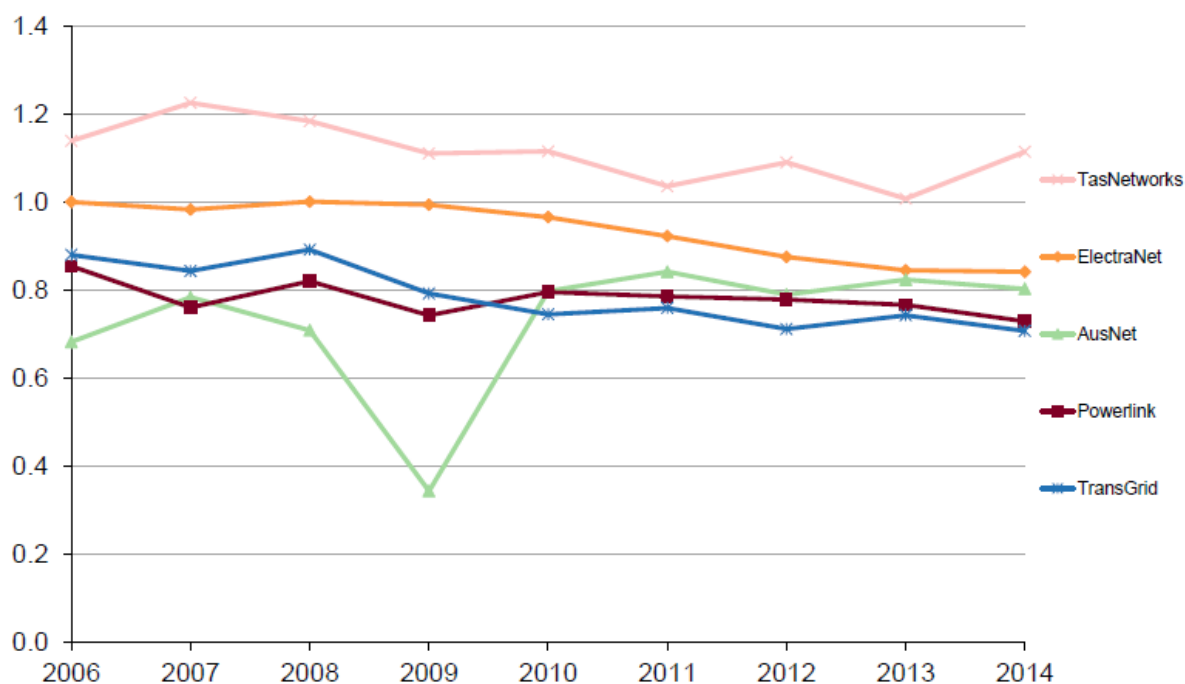
The AER has disregarded its assessment techniques where the results do not accord with the conclusions of its forecasting methodology review. This gives undue weight to its forecasting methodology review and no weight to its other assessment techniques. It concluded that AusNet Services' assessment of safety risk was too conservative, and has adjusted its capex forecast on this basis. The AER has then disregarded evidence produced by the techniques discussed below.

Benchmarking

The AER is required to take into account benchmarking results in assessing AusNet Services' capex forecast (NER 6A.6.7(e)(4)).

The economic benchmarking analysis contained in the Draft Decision (see Figure below) extends back to 2006. AusNet Services' current approach to costing safety risk has been applied for the majority of this period, including the 2014-15 regulatory year which was the subject of the AER's ex post review. This benchmarking analysis does not indicate that AusNet Services' historical performance is inefficient. Indeed, the AER has explicitly deemed AusNet Services' 2014-15 capex to be efficient in its ex post review.

Figure 3.1: Relative MFTP Performance of Transmission Networks



Source: AER, AusNet Services' Draft Decision 6-23

The AER states that:

"...in our capex assessment we have not relied on our high level benchmarking metrics set out below other than to note that these metrics generally support the outcomes of our other techniques."⁹

AusNet Services agrees that the benchmarking analysis generally supports the outcomes of the AER's other techniques, as it does not highlight concerns about AusNet Services' efficiency. However, it does not support the AER's conclusion that AusNet Services' approach to valuing safety risk is inefficient. The very material reduction the AER has made to AusNet Services' capex forecast by adjusting AusNet Services' safety risk assessment is not supported by its benchmarking analysis.

Predictive modelling

The AER applied predictive modelling to assess AusNet Services' SCADA and network protection capex forecast. The results are within 5% of AusNet Services' forecast capex for this expenditure category, and therefore validate that AusNet Services' forecast is at an appropriate level.

However, the AER has disregarded the results of this modelling as it does not support the AER's adjustment to AusNet Services' safety risk assessment. Instead, it has reduced forecast SCADA and network protection capex by 8.2% to reflect its alternative approach to assessing safety risk. This is despite the fact that:

- The results of its predictive modelling do not support the AER's alternative forecast; and
- Safety is not a driver of SCADA and network protection capex. The program replaces obsolete secondary assets and does not address safety risk.

⁹ AER, Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22, July 2016: Attachment 6, p. 22.

Network health indicators

The AER notes that:

“...a material number of substation assets (substation switchbays, substation power transformers and substation reactive plant) remain in service beyond their mean economic lives.”¹⁰

This implies that AusNet Services’ forecasting methodology is not unduly conservative as it does not lead to unwarranted asset replacements. Despite this, the AER has proceeded to apply a material reduction to AusNet Services’ asset replacement program, which targets replacement of this legacy equipment. If the Draft Decision were implemented, we would expect an increase in:

- The mean economic lives of AusNet Services’ substation assets; and
- The number of assets in service beyond their mean economic lives.

The AER has not considered the implications of further increasing the age profile of AusNet Services’ substation assets in the Draft Decision. This impacts not only safety of supply of electricity, but also reliability and security of supply. Our analysis indicates that project deferrals due to safety valuation implied by the Draft Decision would result in around 7.1% of assets at Springvale Terminal Station and 4.5% of assets at West Melbourne Terminal Station failing before they were replaced in the 2022-27 regulatory period. Given the importance of AusNet Services’ transmission network, this reduction in reliability would affect performance of the national electricity system.

As part of its assessment of AusNet Services’ Revenue Proposal, the AER requested, and received, detailed oil testing results for several transformers included in AusNet Services’ proposed replacement program. The Draft Decision does not discuss the conclusions the AER has drawn from this information. Along with its other assessment techniques, this detailed assessment undertaken by the AER could be used to provide a cross-check for its conclusion that AusNet Services’ replacement program is overstated.

Concluding Comments

The assessment approach the AER has taken appears to be very different to that outlined in its 2013 Expenditure Forecast Assessment Guideline, in which it states that it ‘intend(s) to move away from detailed techniques such as project review.’¹¹ While the AER may not consider its approach constitutes a detailed project review, it has adjusted a key assumption in each proposed major project justification, and reduced the forecast on a project-by-project basis. This amounts to deeming each proposed major project scope inefficient.

It seems that detailed review is the only technique the AER has relied upon in its Draft Decision. All other assessment techniques do not indicate that the initial proposal was inefficient.

Therefore, the AER’s approach can be characterised as only having had regard to a single technique, being its methodology review, and specifically its adjustment to assumed safety risk.

¹⁰ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016, Attachment 6, p. 4.

¹¹ AER, *Expenditure Forecast Assessment Guideline*, p. 12.

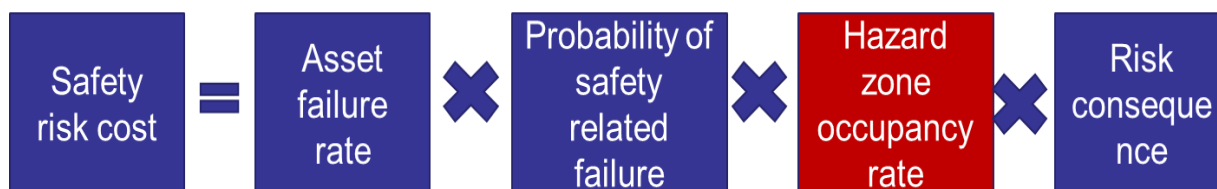
Box 3.1: Response to Stakeholder Feedback on the AER’s Application of Benchmarking**Stakeholders asked whether the AER had undertaken benchmarking of transmission networks and whether this had been relied on in the Draft Decision.**

As described above and in Section 4.5 of our initial Revenue Proposal, the AER undertakes both high level and category-specific benchmarking for transmission networks. AusNet Services performs strongly in this benchmarking analysis compared to its peers, particularly when examining productivity trends over time. The AER is required to consider its benchmarking analysis when assessing networks’ expenditure forecasts.

While it is recognised that there are challenges in robustly benchmarking transmission businesses, partly due to the small sample size, AusNet Services is concerned that the AER has not placed due weight on its benchmarking analysis in its Draft Decision.

3.4 Adjustment to Safety Assumption**3.4.1 Draft Decision**

The Draft Decision has modified AusNet Services’ quantification of safety risk based on a set of assumptions that the AER considers to be more realistic. Specifically, it has introduced an additional factor, a ‘Hazard Zone Occupancy Rate’ (highlighted red in the Figure below), into AusNet Services’ approach to costing safety risk. The AER defines this as ‘the likelihood that a person is in the vicinity of a safety related asset failure’¹², and has estimated this based on ‘assumptions regarding the typical frequency and duration of a person being in the vicinity of assets that fail.’¹³

Figure 3.2: The AER’s Adjustment to AusNet Services’ Safety Risk Cost

The AER considers the Hazard Zone Occupancy Rate is 1%. This has reduced AusNet Services’ quantified safety risk by a factor of 100.

The AER has, however, accepted AusNet Services’ quantification of:

- Asset failure rates;
- Probability of a safety related failure; and
- Risk consequence.

The AER has adjusted AusNet Services’ capex forecast to account for the reduction in safety risk by making a proportional reduction to the forecast costs for each major replacement project. This has resulted in the cost reductions in a number of major projects, which, when combined with the effects of a reduction in reliability risk, result in the following reductions:

- West Melbourne Terminal Station (\$106m to \$58m);
- Templestowe Terminal Station (\$24m to \$17m);
- Springvale Terminal Station (\$75m to \$25m); and

¹² AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 46.

¹³ Ibid.

- Fisherman’s Bend Terminal Station (\$37m to \$12m).

The AER has also reduced the expenditure forecast for programs of work by 8.2%, based on an assessment of the impact of its reduction to costed safety risk across a sample of three programs.

3.4.2 AusNet Services’ Response

3.4.2.1 Overview

AusNet Services acknowledges that the AER’s inclusion of a Hazard Zone Occupancy rate is one way its approach to valuing safety risk could be refined. This part of AusNet Services’ calculation is considered to be conservative by the AER. However, adjusting this element alone would not be appropriate. It is essential to conduct a comprehensive review of each assumption underlying the methodology to ensure that the resulting safety outcomes are acceptable.

Therefore, AusNet Services has not adopted the AER’s approach to costing safety risk. While elements of the approach could be refined, overall it leads to targeted and efficient replacement of the most risky assets to the degree required by safety obligations.

Our asset management experience and observed safety outcomes demonstrate that, as a package, the approach is reasonable. Following the Draft Decision, AusNet Services engaged GHD to advise on whether our current safety risk assessment approach is reasonable overall. GHD found that the basis of AusNet Services’ quantitative risk assessment is sound¹⁴.

AusNet Services’ approach to costing safety risk recognises that addressing safety risk is a legal obligation. AusNet Services accepts that economic analysis can and should inform safety driven capital expenditure. However, the approach must be applied cautiously because cost-benefit analysis relies on a quantitative assessment of safety risk, which is inherently imprecise and uncertain. Some components are more straightforward to calculate than others. When deriving an approach, it is important to consider the estimated risk cost broadly, to ensure that the overall outcome is reasonable.

The Board of AusNet Services is ultimately responsible for network safety outcomes. It stands behind AusNet Services’ current safety risk assessment methodology and is concerned about the approach applied by the AER in its Draft Decision:

“It is the Board’s considered position that this safety risk assessment, and the safety standard it produces, are not only appropriate, but necessary.

It has caused concern to the Board that the AER has suggested that the safety standards of AusNet Services are at a level beyond that which a prudent network service provider would, or should, maintain.

This is particularly an issue in relation to major projects which have already been approved by the AER, such as the West Melbourne Terminal Station rebuild. These projects incorporate improved safety outcomes through the reduction of risks posed to staff of AusNet Services and the public. The Board will not accept any diminution of safety standards inherent in these projects, given that this would jeopardise the current planned replacement program of assets posing safety risk.”¹⁵

Since AusNet Services’ Revenue Proposal was submitted in October 2015, there has been a serious incident involving an explosive failure at the Richmond Terminal Station, during an active rebuild project (see Box 3.2 below). The recent explosive failure at Richmond is a reminder that safety is much broader in scope and less certain than assumed by economic analysis. AusNet Services is therefore concerned that if implemented, the Draft Decision

¹⁴ Appendix 3A – GHD, *Risk Engineering Expert Advice – Safety Risk Quantification Report*, September 2016.

¹⁵ Appendix 3B – Statement of the Board of AusNet Services.

approach would expose AusNet Services' workers and the general public to unacceptable safety risks.

A number of elements of AusNet Services' safety risk assessment methodology indicate that AusNet Services may currently understate safety risk, offsetting any perceived conservatism in the Hazard Zone Occupancy rate. These include:

- It does not explicitly account for multiple (30 to 50) workers to be located within hazard zones in working hours over several years during end-of-life brownfield replacement projects;
- It does not explicitly account for the risk to the general public. As the major replacement projects proposed are located in metropolitan Melbourne next to areas frequented by the general public, including train lines, business precincts, public parks and major roads, this must be done;
- The assumed value of a life used is lower than more recent electricity industry sources indicate it should be;¹⁶ and
- It does not account for all the consequences associated with an explosive failure. These include project delay costs, legal costs, impacts on supply and lost workforce productivity. Currently only the value of a life is included as a consequence of an explosive failure.

As AusNet Services operates on the basis that terminal stations are safe to access at any time (e.g. to fix faults and to undertake corrective maintenance), the methodology used reflects this operational requirement. If this were to change, then it is less likely that brownfield major replacement projects, such as those included in AusNet Services' capex forecast, would be able to safely proceed. Instead, greenfield replacement projects may be the only feasible solution, at a far higher cost to customers.

Overall, AusNet Services does not expect that a more refined approach would result in a lower safety risk cost than is currently applied for the numerous reasons detailed in the remainder of this section.

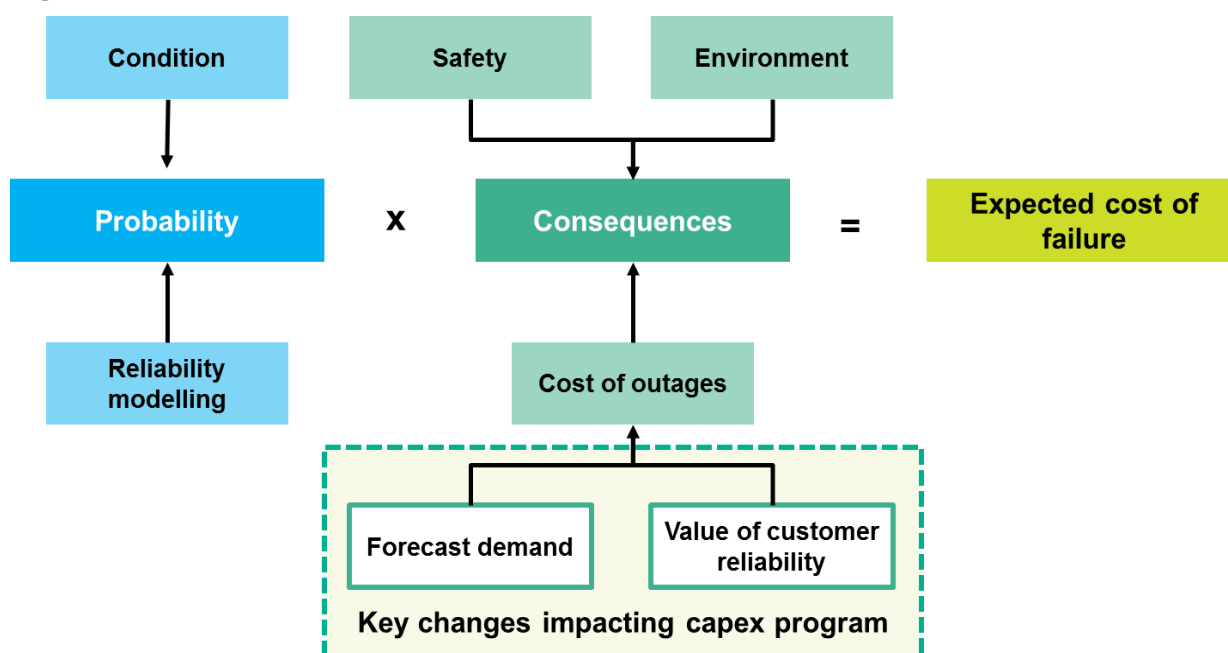
3.4.2.2 Background

AusNet Services' Economic Assessment Approach

While the most material reduction to the capex forecast is due to the quantification of safety risk, it is important to understand that AusNet Services' Revenue Proposal did not contain a significant increase in forecast capex specifically to address safety-related requirements. Instead, the Revenue Proposal applies an economic assessment to forecast network capex. This assessment combines the probability and consequence of several risks (including reliability and safety), to derive the expected cost of failure. The approach is shown in the Figure below.

¹⁶ AS7000 presents the statistical value of a life of \$10m. Applying a disproportionality factor of 3 for a worker results in \$30m; using a higher disproportionality factor for a member of the public would increase this.

Figure 3.3: Economic Evaluation Method



When the total project benefits such as reduced safety and reliability risk, and reduced operation and maintenance expenditure exceed the cost of the most efficient (least cost) solution to addressing the failure risk, the project is deemed economic and will proceed. This assessment approach is applied throughout AusNet Services' network capex program, including major replacement projects and programs of works.

AusNet Services' Revenue Proposal included an 8% reduction in forecast capex compared to the current regulatory period, due to the reduction in both forecast demand and the Value of Customer Reliability. This reduced the reliability risk and consequence across the network, and led to project deferrals. Through ensuring projects do not proceed until the cost to consumers is offset by the reduction in the risks, the resulting forecast reflects the long-term interests of consumers.

This economic assessment approach, including the approach to valuing safety risk, has been applied by AusNet Services' transmission and distribution networks in previous regulatory periods and approved by the AER. The approach has resulted in efficient outcomes, illustrated by AusNet Services' benchmarking performance, including the lowest level of RAB growth across the NEM and the lowest RAB per customer. Victorian transmission prices have also been low and stable over this period, avoiding the large increases seen in NSW and Queensland, while service levels have been consistently strong.

The AER's ex post assessment of the efficiency of 2014-15 capex confirms that AusNet Services' expenditure has been efficient:

"We are satisfied that AusNet Services capital expenditure in the 2014-15 regulatory year reasonably reflects the capital expenditure criteria."¹⁷

The capex incurred in 2014-15 incorporates expenditure that reflects AusNet Services' approach to quantifying safety risk. It is contradictory that, as part of the same decision, the AER can accept actual expenditure in 2014-15 as efficient, but then deem the approach that was applied to justify that expenditure to be inefficient.

¹⁷ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 81.

Meeting the Safety Standard Set by Legislative Obligations

AusNet Services is required to eliminate, where practicable, the risk of an incident before it occurs – this is the effect of legislative and regulatory requirements which oblige AusNet Services to maintain a safe workplace, safe systems of work, a safe electricity supply and the safety of staff and the public (e.g. *Occupational Health and Safety Act 2004* (Vic); NEO and NER; *Electricity Safety Act 1998* (Vic)). This goes beyond an obligation to mitigate the risks when the incident actually occurs. This is an important point of distinction that has not been considered in the Draft Decision. AusNet Services' current approach explicitly meets this requirement by assuming that each explosive failure has a consequence attached to it. This ensures that explosive failures are eliminated where the benefits of elimination exceed the cost (i.e. to the extent practicable). Any change to this assumption would need to be closely examined to ensure this obligation continued to be met.

Under the NER, AusNet Services must be allowed the capital expenditure to enable it to meet its regulatory obligations and requirements in relation to safety, including those beyond the regulations imposed by the electricity industry regulatory framework.¹⁸

The regulatory obligations AusNet Services must comply with include the:

- Electricity Safety Act 1998 (Vic);
- Victorian Electricity Safety (Management) Regulations 2013;
- Australian Standard 5577 – 2013 Electricity Safety Management Systems; and
- Occupational Health and Safety Act 2004 (Vic) and Regulations.

The Electricity Safety Act specifies that:

*“A major electricity company must design, construct, operate, maintain and **decommission its supply network to minimize as far as practicable** –*

*a) **The hazards and risks to the safety of any person arising from the supply network...**”¹⁹*

The words emphasised in bold clarify that AusNet Services is required to minimise **as far as practicable** safety hazards and risks to any person (i.e. both workers and the general public). This explicitly refers to decommissioning assets (i.e. during replacement projects).

The Electricity Safety Act provides further guidance on the meaning of ‘practicable’, being the need to have regard to:

“(a) the severity of the hazard or risk in question; and

(b) the state of knowledge above the hazard or risk and any ways of removing or mitigating the hazard or risk; and

(c) the availability and suitability of ways to remove or mitigate the hazard or risk; and

(d) the cost of removing or mitigating the hazard or risk.”²⁰

The need to have regard to the severity of the hazard or risk (part (a) above) is relevant when considering AusNet Services' obligations in relation to explosive failures. An explosive failure is a very severe hazard with the potential to result in multiple fatalities, particularly during a major replacement project when a large number of workers are on site. AusNet Services has a clear and strong obligation to minimise the risk of an explosive failure as far as practicable.

¹⁸ Section 7A(2)(b) of the NEL provides that a “regulated network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in...complying with a regulatory obligation or requirement...”

¹⁹ Electricity Safety Act 1998, Part 10, Division 1, Section 98.

²⁰ Electricity Safety Act 1998, Part 1, Section 3

Further, the requirement to deliver electricity safely is embedded in the NEO and revenue and pricing principles. Safety issues on a transmission network impact not only safety of supply of electricity, but also reliability and security of supply.

The Draft Decision refers to AusNet Services' estimate of risk consequence as achieving compliance with the 'as low as reasonably practicable' (ALARP) principle²¹. However, the Electricity Safety Act requires AusNet Services to comply with a '**so far as is practicable**' (or **SFAIP**) principle.²² GHD, an independent engineering firm with expertise in this area, describes the two concepts as follows (note that AFAP is an alternative way of expressing SFAIP):

"The principle of as low as reasonably practicable (ALARP) is fundamental in risk management. By definition ALARP considers the financial capacity in applying risk management actions and controls i.e. what is financially reasonable to be done to manage a hazard. AFAP, as defined in the Victorian Electricity Safety Act, is a practicality based process which focuses partially on financial capacity, but also on the severity and state of knowledge of a hazard as well as the availability and suitability of removing or mitigating the hazard. i.e. for legislative purposes, high consequence hazards with information of increased risk due to its condition, focusses on what ought to be done to remove or mitigate the risk considering availability, suitability and cost. AFAP is generally what legislation requires i.e. the regulatory mandate and takes precedence over ALARP."²³

AusNet Services' current approach does eliminate the hazard to the extent practicable, where the extent practicable is determined by the point at which the costs of taking further action exceeds the benefits.

In addition, Australian Standard 5577 (Electricity Network Safety Management Systems) sets out that:

*"(e) **Risk treatment, including where reasonably practicable the elimination of the source of risk** and where elimination is not reasonably practicable, the identification of treatments or controls so that residual risks are reduced to as low as reasonably practicable"²⁴*

This specifies that elimination of the hazard must be given primacy over controlling or treating the risk, if it is reasonably practicable to do so. This concept is shown in the hierarchy of control pyramid below.

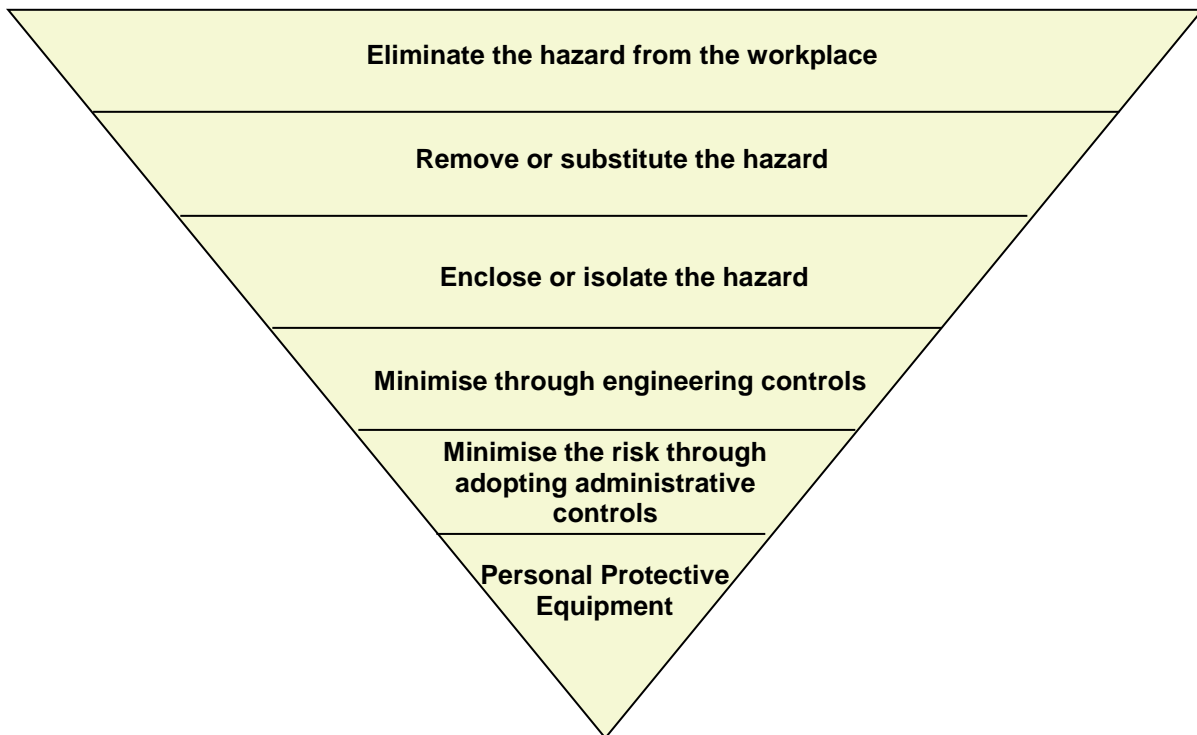
²¹ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 46.

²² Electricity Safety Act 1998, Part 10 Division 1 Section 98.

²³ Appendix 3A – GHD, *Risk Engineering Expert Advice – Safety Risk Quantification Report*, September 2016

²⁴ AS5577 Clause 4.3.2.

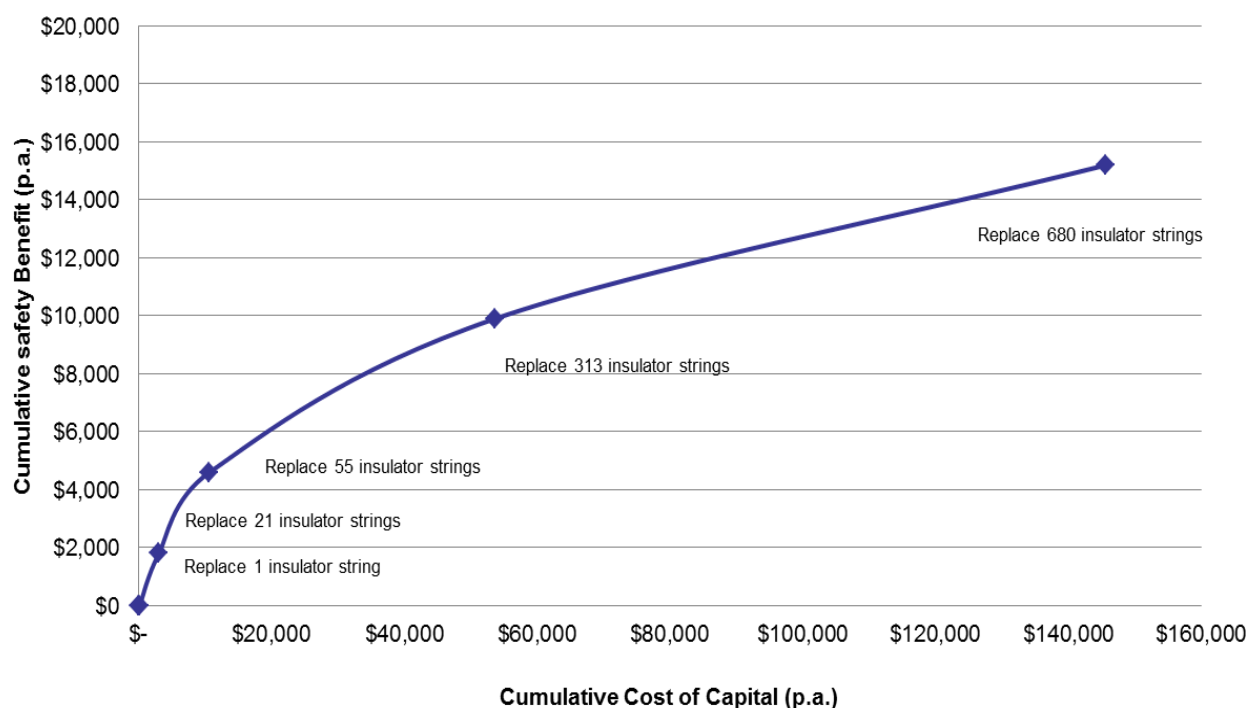
Figure 3.4: Hierarchy of Risk Control



AusNet Services complies with this legislative requirement by replacing assets that present an uneconomic safety risk. Eliminating the risk to the extent that AusNet Services currently does **is** practicable, and AusNet Services' capex forecast and incurred in accordance with this principle has not previously been found to be inefficient by the AER.

A financial analysis of the requirement to mitigate a hazard to the extent practicable is demonstrated through the following example. This provides an assessment of the appropriate number of insulator string replacements to be undertaken to avoid future worker fatalities, to the extent practicable.

The Figure below compares the cumulative cost of capital with the cumulative safety benefits of replacing different quantities of insulator strings.

Figure 3.5: Cumulative Safety Costs and Benefits

The Figure shows that there is a similar degree of cost-benefit proportionality in the options to replace 1, 21 and 55 insulator strings. Each additional dollar invested yields a similar magnitude of safety benefits.

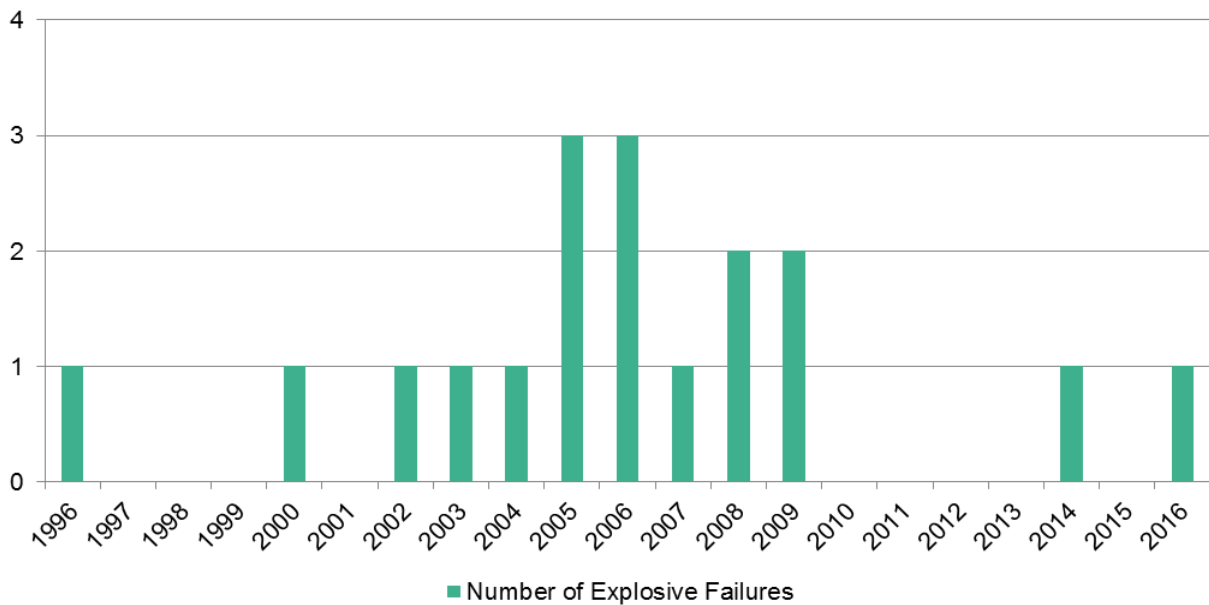
However, the remaining two options (to replace 313 and 680 insulator strings) deliver a lower level of safety benefit per dollar invested. Considering the cost-safety benefit ratio alone indicates that the two options may lie beyond the 'so far as is practicable' standard. Whether these options are economically justified depends on the extent of additional benefits (e.g. reliability) that would be realised.

Risk Currently Borne on the Transmission Network

Under AusNet Services' economic approach to forecasting capital works, risk is borne up to the point whereby the cost of the risk exceeds the cost of addressing the risk (i.e. the cost of replacement). Therefore, it would be a misrepresentation to suggest that this means AusNet Services bears no risk (including safety risk).

The fact that AusNet Services has had failures on its network (explosive and non-explosive), despite its rigorous safety risk assessment, demonstrates that it currently bears a level of safety risk. Experience in managing transmission assets over time has led AusNet Services to conclude that the current risk of failures (including explosive failures) is at a level that is prudent and reasonable, consistent with its obligations under the NER, but not at a level which can be guaranteed never to result in a safety or security of supply incident. If implemented, the AER's approach would increase the number of failures, including explosive failures. This would be contrary to the legislative requirement to minimise this risk to the extent practicable.

The number of explosive failures over the past 20 years is shown in the Figure below.

Figure 3.6: Historical Explosive Failures

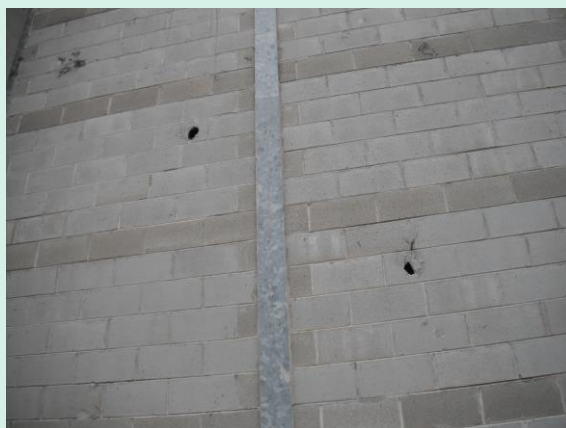
Analysis of these events shows that 50% occurred within working hours. Explosive failures are more likely to occur during periods of high temperature and when assets are highly loaded i.e. during peak periods. It is not equally likely that explosive failures are equally likely to occur at any time within a 24 hour period.

The explosive failures that are shown above include some very concerning misses. As described in the Box below, an explosive failure of a 220 kV current transformer (CT) at Richmond Terminal Station in June 2016 was an extremely near miss of passing personnel, by a matter of minutes.

Box 3.2: Explosive Failure at Richmond Terminal Station – 7 June 2016

An explosive failure of a 220kV current transformer (CT) occurred at Richmond Terminal Station on 7 June 2016. The CT that exploded was scheduled for replacement within the next 6 months. This incident occurred during a major rebuild project, and it was very lucky that nobody was injured. The site was heavily occupied just half an hour before the incident occurred, and an occupied vehicle was parked next to the CT just minutes before it exploded.

The force of the explosion meant that shrapnel pierced through a nearby bund wall, as shown below. The radius of debris extended 60m from the source of the explosion.



As there were other CTs of identical age, make and condition on the site, to minimise risks of a further explosive failure, an exclusion zone was implemented and shipping containers were brought onto site to surround these assets. The hazard zone extended onto the Monash freeway and other public areas. Given this, it was necessary to de-energise some of the remaining CTs, which placed Melbourne CBD on single contingency supply, thereby increasing reliability risk.

The event also resulted in a delay to the replacement project, investigations and installing additional safety mitigation measures. These all added to the cost of the incident. These cost types are not currently included in the quantification of consequence in AusNet Services' economic assessments.

This incident demonstrates the level of safety risk aging transmission assets pose to the workforce and the general public. If the AER's discount to safety risk were actually applied by AusNet Services, these incidents would become more frequent and it would be a matter of time before someone was seriously hurt.

Fortunately, no one was hurt by the explosive failure at the Richmond Terminal Station. The incident posed an unexpected and significant level of risk to workers and the general public. This case study provides practical evidence that:

- AusNet Services' current safety risk assessment methodology is not overly conservative; and
- A methodology change that increased the frequency of these events (which is the implication of the AER's Draft Decision) would be inappropriate and inconsistent with our safety obligations.

Over the previous two regulatory periods AusNet Services has replaced its oldest assets that have the highest levels of safety risk on the network. These include:

- Oil insulated current and voltage transformers that are prone to fail in a manner that involve explosion and fire. This risk is not theoretical, actual failures that involve explosion and fire

of current and voltage transformers have occurred at the Terang, South Morang, Moorabool, Jeeralang and Richmond terminal stations.

- Power transformers with deteriorated internal insulation or other defects that posed an increased risk of a major failure.
- Synthetic resin bonded paper (SRBP) transformer bushings, which is an obsolete bushing design that poses a risk of explosive failure due to oil draining from the bushing into the transformer main tank and the consequent ingress of moisture.
- Bulk oil 220 kV circuit breakers that pose risks due to the significant volumes of oil and operation and maintenance procedures that do not comply with modern safe operational and maintenance work practices.

Most of the assets mentioned above were installed in the 1960s when technology was far less advanced than it is today. These less safe assets, which surpassed their economic lives some time ago, are being replaced by modern assets with much improved safety specifications. In addition to removing the current safety risk associated with the existing end of life assets it is expected that the safety risks posed by these modern assets when they reach the end of their lives will be far lower than the safety risks posed by the legacy assets on the network today.

After the next two regulatory periods, AusNet Services expects that the replacement of older 220kV assets will largely be complete, and therefore the long-term safety risk of its 220kV network will be below current levels. However, today there remain legacy assets on the network that require replacement before they become too dangerous to allow replacement to occur in a cost-effective manner.

Box 3.3: What is an Explosive Failure?

An explosive failure of high voltage (HV) equipment is generally caused by an internal failure that leads to a rapid release of heat, causing very hot gases and water vapour to be released. This results in a rapid build-up of pressure within the asset, until an uncontrolled and sudden rupture of the external layer of porcelain or metal occurs.

This allows the instant release of stored energy, in the form of sound, kinetic and thermal energy. The kinetic energy causes fragments of the assets to be projected a distance away at a high speed, as outlined in the Table below. The thermal energy released can cause burning and can damage the structural integrity of the equipment and its connection conductors.



Example: Explosive Failure of High Voltage Instrument Transformers and Bushings with Porcelain Insulating Weather Shield

Generally, high voltage devices (e.g. instrument transformers, bushings, etc.) constructed with porcelain weather shields could fail explosively, releasing porcelain fragments as high velocity projectiles travelling up to 100m and weighing up to 7.5kg. The size, mass and distance travelled depend on a number of factors including:

- The quantum of energy involved in the internal fault;
- The pressure at which the porcelain fails and releases fragments; and
- The location of the fault within the device.

The Table below shows typical observed projectile travel distances for explosive failures for two voltage classes of current transformers.

	500kV Oil Filled Current Transformer	220kV Oil Filled Current Transformer
Typical projectile size	5 to 40cm	5 to 40cm and smaller fragments <5cm
Typical projectile weight	0.1 to 4.5kgs	0.1 to 4.5kgs
Projectile travel distance	Maximum radius = 100m+	Maximum radius = 70m+

The major replacement projects included in the capex forecast include replacing some of the oldest and poorest condition equipment that poses the highest risk on the network. These are described in the Table below.

Table 3.3: Assets Proposed for Replacement Posing an Explosive Failure Risk

Station	Key Assets that Pose an Explosive Failure Risk	Target Project Completion Date
West Melbourne Terminal Station	220kV circuit breaker bushings, 66kV instrument transformers, 66 kV bulk oil circuit breakers, transformer bushings and 22kV switchboards. The 22kV equipment in particular poses a high safety risk.	2021-22
Fisherman's Bend Terminal Station	Instrument transformers, 220kV circuit breaker bushings, 66kV bulk oil circuit breakers and transformer bushings.	2020-21
Templestowe Terminal Station	Instrument transformers, 66kV bulk oil circuit breakers and transformer bushings.	2022-23
Springvale Terminal Station	Instrument transformers, 220kV circuit breaker bushings, 66kV bulk oil circuit breakers and transformer bushings.	2021-22

In its 2014 determination the AER accepted the need for the WMTS rebuild to proceed, given the age and condition of existing assets. This was based on advice from its consultants, EMCa, who highlighted the safety risk posed by the ageing assets.²⁵

As part of its capex forecast assessment, the AER requested, and AusNet Services provided, oil testing results for the transformers proposed for replacement at West Melbourne, Fisherman's Bend and Springvale. This contains highly detailed information on the current condition of these transformers. AusNet Services considers that this detailed information demonstrates that the replacement of these transformers is warranted. The Draft Decision does not indicate whether the AER considers that this information verifies its conclusion that full scope of AusNet Services' proposed major replacement projects is not justified. AusNet Services encourages the AER to describe the outcomes of this assessment in its Final Decision.

Further details on the assets requiring replacement at each site are contained in the relevant Planning Reports, submitted alongside AusNet Services' Revenue Proposal.

In addition, AusNet Services' proposed program of works includes the replacement of circuit breakers which have been assessed as having an elevated probability of failure based on their condition.

3.4.2.3 AusNet Services' Quantification of Safety Risk

AusNet Services' approach to valuing safety risk as part of its economic assessment of replacement projects has been developed based on the legislative and regulatory obligations it must meet with respect to protecting the safety of its workforce and the general public, and also takes into account that investment to reduce safety risk is only justified when the benefits of investment exceed the costs.

The approach is based on the equation shown in the Figure below.

²⁵ EMCa Report to AER August 2013, p. 54.

Figure 3.7: AusNet Services' Safety Risk Quantification Approach



The components of this equation are defined as follows:

- Asset failure rates – the probability that an asset will experience a major failure in any particular year.
- Probability of a safety-related failure – this is the probability that, given a failure occurs, that failure will be an explosive failure, the probable consequences of which are injury, death and property damage. This probability differs by type of equipment, for example, this probability is higher for current transformers than for circuit breakers.
- Risk consequence – this is the risk consequence of a fatality, expressed in dollar terms.

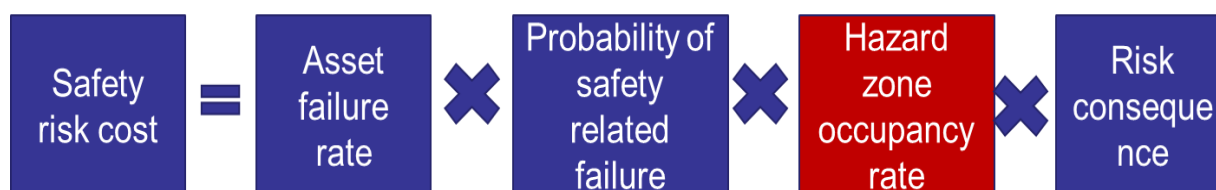
AusNet Services' approach to quantifying safety risk has been consistently applied, and accepted by the AER, in previous transmission and its recent distribution review. In addition, the AER has recognised that AusNet Services' overall application of quantified risk assessments is consistent with good practice within the electricity industry.²⁶ AusNet Services understands that, within the NEM, it adopts one of the most robust approaches to economically assessing replacement projects.

However, we recognise that the approach is relatively simple. There may be lessons to learn from other industries (such as mining, and oil and gas) and improvements may be able to be made. We will closely consider the recommendations made by GHD in the future. However, the fact that refinements may be able to be made to costing safety risk does not imply that AusNet Services' current approach results in inefficient outcomes.

The Draft Decision 1% Hazard Zone Occupancy Rate Assumption

The Draft Decision has introduced an additional factor, a 'Hazard Zone Occupancy Rate' (highlighted red in the Figure below) into AusNet Services' approach to costing safety risk.

Figure 3.8: The AER's Adjustment to AusNet Services' Safety Risk Cost



The Draft Decision defines the Hazard Zone Occupancy (HZO) Rate assumption to be:

"The likelihood that a person will be in the vicinity of an asset when it fails"²⁷

Based on its 'internal engineering and technical expertise, and knowledge of network asset management practices²⁸', the AER has set this equal to 1%. AusNet Service acknowledges this estimate was indicative only and that the AER has invited further information to be provided.

²⁶ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 45.

²⁷ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 47.

The Draft Decision calculation takes into account over the life of an asset:

- The number of hours in a year that somebody will be on site; and
- The presence of multiple people on the site over this time period.²⁹

That is, a formulaic representation of the HZO Rate can be expressed as:

$$\text{Hazard Zone Occupancy Rate} = \frac{\sum_{\text{activity}} (\text{hours of occupation} \times \text{no. people on the site})}{\text{Total hours per year}}$$

A sum is taken for each activity considered by the AER; operation, routine inspections, maintenance and refurbishment.³⁰

The HZO Rate calculated and applied by the AER is not bound by 100% because it factors in multiple people on site. Indeed, during a major replacement project, AusNet Services calculates that the HZO Rate would significantly exceed 100%. This is because teams of 20 to 50 workers will be on site during working hours for periods of between 2 and 6 years (see Appendix 3C – AER’s HZO Rate Model).

To test the Draft Decision approach, AusNet Services has applied the AER’s HZO Rate Model to estimate the relevant HZO Rate to forecast major replacement projects, accounting for the factors above. The resulting HZO Rate is as follows:

- West Melbourne Terminal Station = 820%
- Springvale Terminal Station = 820%
- Fisherman’s Bend Terminal Station = 342%
- Templestowe Terminal Station = 342%

AusNet Services’ own forecasting methodology did not include a HZO Rate. However, the AER considers that this is implicitly 100%. This does not appear to be a conservative assumption, compared to the results obtained by applying the Draft Decision approach to assessing the HZO Rate. Note that these calculations do not take into account any risk to general public safety, which would only increase the HZO Rate if accounted for.

If the HZO Rate were defined as the proportion of time over any year that at least one person is in the hazard zone of an asset, then the HZO Rate would be bound by 100%. Under this approach, the presence of multiple workers and/or members of the general public would need to be dealt with by scaling the risk consequence upwards to account for the potential for multiple fatalities and applying a larger disproportionality factor that applies to members of the general public. This scaling is not required in AusNet Services’ current approach, given the implicit 100% HZO Rate, but should be included if our approach was refined. It is noted that the costed safety risk would be equivalent under either definition of the HZO Rate.

The Draft Decision estimate of a 1% HZO Rate is not applicable in the circumstances present for the major replacement projects proposed and would not enable AusNet Services to meet its safety obligations, because it:

- Is based on average hazard zone occupancy over the duration of an assets’ life and excludes end-of-life asset replacement projects, which are undertaken at the time when explosive failures are most likely;³¹

²⁸ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 46.

²⁹ No consideration is given to a member of the general public outside a sites boundary, but within the hazard zone of the asset.

³⁰ Note that asset refurbishment is not the same as asset replacement

³¹ The assets that present a safety risk exhibit a wear out failure profile with increased likelihood of a failure at the end of their technical life. The increased switching operations required during a brownfield asset replacement project increase the duty and loading on old deteriorated assets, which further increase the risk of a failure.

- Does not take into account the presence of the general public within the hazard zone, which is very significant given the major replacement projects proposed are located at CBD and metropolitan terminal stations; and
- Does not accurately represent the operating and maintenance requirements of transmission assets and AusNet Services' works practices.

These points are addressed in turn.

Higher occupancy rates exist during replacement projects

The risk of an explosive failure increases exponentially later in an asset's life. This is because an asset's condition deteriorates with use over time. Therefore, when assessing safety risk, it is appropriate to focus on the hazards presented when an asset is in poor condition, generally towards the end of its life. This is when replacement projects proceed, requiring a high number of workers to be on site. In addition, during a replacement project assets are taken in and out of service to enable work to proceed. This increased switching activity places more strain on the assets, increasing the risk of asset failure over this period.³² Therefore, the potential for a very severe hazard is highest during major replacement projects.³³

The HZO Rate in the past is irrelevant. It would be inappropriate for AusNet Services to assess its major replacement projects using a level of safety risk based on exposure and risk of the workforce and the general public on average over an asset's entire life.

To comply with legislative obligations to mitigate risks and safety hazards to both workers and the general public, AusNet Services' approach to safety must be fit for the purpose to which it is being applied. In this case, the analysis is used to assess whether a brownfield replacement project is economic. The risk level that it is appropriate to use for this assessment is the level of risk over the next five years, including that during the replacement project. AusNet Services has a legislative requirement to:

- Protect workers at all times, including (and explicitly) when decommissioning the network;³⁴ and
- To have regard to the severity of the hazard in question. As explosive failures are very severe hazards, particularly during major replacement projects when many workers will be on site, AusNet Services is explicitly required to minimise, as far as practicable, the risk of an explosive failure occurring during a replacement project.

The reasonableness of the approach is supported by GHD:

"As regulatory requirements require that safety be considered for any person throughout the whole life cycle of the asset, it is appropriate to include decommissioning / replacement activities when considering occupancy."³⁵

On average, replacing a single transformer requires workers to be on site for around a year. The major replacement projects proposed by AusNet Services will last between 2 and 6 years. Major rebuilds require far higher numbers of workers – for example, at the peak of the Richmond Terminal Station rebuild, up to 120 workers were on site at once. On average, around 50 workers were onsite each weekday during working hours. Weekend work was also required during certain stages of the project. The presence of multiple people on site increases the HZO Rate calculated under the AER's methodology to approximately 300% to 800%, depending on the scale of the specific project. This uplift is not applied in AusNet Services'

³² The increased risk of an asset failure during a replacement project due to increased operation of the asset is not reflected in asset failure rates.

³³ The Electricity Safety Act requires AusNet Services to consider the severity of the hazard in its safety risk assessment.

³⁴ Electricity Safety Act 1998, Part 10, Division 1, Section 98.

³⁵ Appendix 3A – GHD, *Risk Engineering Expert Advice – Safety Risk Quantification Report*, September 2016, p. 7.

current approach, given its implicit 100% HZO Rate, but should be included if the approach were to be refined.

During replacement projects, it is critical that the site is a safe environment for the workers there. As outlined above, minimising risks and hazards to workers is a legislative requirement with which AusNet Services has no choice but to comply. If AusNet Services were not to consider the safety risk of its workers and the general public during brownfield replacement projects (where site occupancy is at its highest), brownfield replacements would likely be impossible as a result of the heightened safety risk. Instead, either entire stations would need to be de-energised to create an acceptable working environment (at great reliability cost to consumers, which could expose AusNet Services to possible breach of its transmission licence conditions) or, alternatively, greenfield replacement options would be required.

The AER has made an error in assuming that AusNet Services could continue to deliver brownfield replacement projects under the AER's quantification of safety risks. Instead, these projects would be deferred beyond the point at which brownfield replacements would be viable. AusNet Services would need to re-evaluate its project options and redesign replacement projects to include prolonged outage requirements (which would be likely to extend the duration of the project) and greenfield replacements. Both of these options would result in far higher customer costs (see Appendix 3D) which would further undermine the achievement of the NEO.

Safety risk to the general public must be considered

AusNet Services is required by law to minimise risks and hazards presented by the transmission system to the general public. The AER's Draft Decision acknowledges that this is the case, but does not reflect this in its safety risk valuation.

Conversely, AusNet Services' approach takes the safety of the general public into account through the implicit 100% HZO Rate. If the HZO Rate were reduced, general public safety risk and associated consequences should be explicitly included elsewhere in the assessment.

The hazard zones for the majority of terminal stations at which the proposed major replacement projects are located extend beyond the boundaries of the terminal stations. The major replacement projects proposed are all located in metropolitan areas. The real potential for to be multiple members of the general public located within the hazard zones of these sites should also be taken into account. For the West Melbourne and Fisherman's Bend projects, where the hazard zones extend onto major train lines and the Citylink freeway, a HZO Rate of close to 100% for general public occupancy is not unreasonable.

The Table below describes the public areas that are within the hazard zones of the terminal stations subject to proposed major replacement projects.

Table 3.4: Public Areas within Terminal Station Hazard Zones

Terminal Station	Public Areas
West Melbourne Terminal Station	Train tracks providing four major lines into the CBD Public road Industrial site, including a public gym
Fisherman's Bend Terminal Station	Citylink Connecting road joining Citylink and Westgate Freeway Public street Industrial site and surrounding grassland
Templestowe Terminal Station	Woodland Former quarry site

Terminal Station	Public Areas
Springvale Terminal Station	Public road Industrial shopping strip Concrete suppliers
East Rowville Terminal Station	Access road

The extent of the hazard zones are shown in Appendix 3E – Hazard Zones.

Reflecting the requirements of transmission assets and works practices in a HZO

AusNet Services would like to provide further information to inform the AER's HZO calculation which appears unrealistically low as outlined in the Table below.

Table 3.5: AER's Hazard Zone Occupancy Modelling

Category	AER's Assumption	AusNet Services' Response
Operations	Requires two people to be on site for 0.5 hours per year.	On average, 27 man hours per annum per terminal station are required for this purpose.
Routine Inspection	Requires two people to be on site twice a year for two hours.	As per AusNet Services' asset inspection procedures, over 112 man hours per annum per terminal station are required for oil sampling, non-invasive inspections, secondary asset inspections and general site inspections.
Maintenance	Requires six people to be on site once every five years for one week.	As per AusNet Services' terminal station asset maintenance procedures, over 843 man hours per annum per terminal station are required for the routine maintenance of circuit breakers, transformers, disconnectors, etc.
Refurbishment	Requires ten people to be on site once every fifty years for twelve weeks.	To complete the refurbishment work program proposed, over 475 man hours per annum per terminal station are required for the 2017-22 period. This is separate to the forecast major replacement projects.

AusNet Services does not propose to apply the alternative assumptions for the categories outlined above, because, under its legislative requirements, it must consider the safety of the site during the period of the major replacement project. The average occupancy of the site over the asset's 40 to 60 year life due to the activities listed above is irrelevant given the nature of the project that is being assessed.

Moreover, it is AusNet Services' contention that this approach fails to acknowledge that it only requires a worker or member of the public to be in the vicinity of an asset *at the time* it fails, for these small risks to materialise.

3.4.2.4 Safety Risk Assessment should be Considered Holistically

The AER considers that AusNet Services' approach to quantifying safety risk is unduly conservative, as AusNet Services assumes that someone is always within the vicinity of an asset if it explosively fails. This is consistent with a HZO Rate of 100% being implicitly included in this calculation.

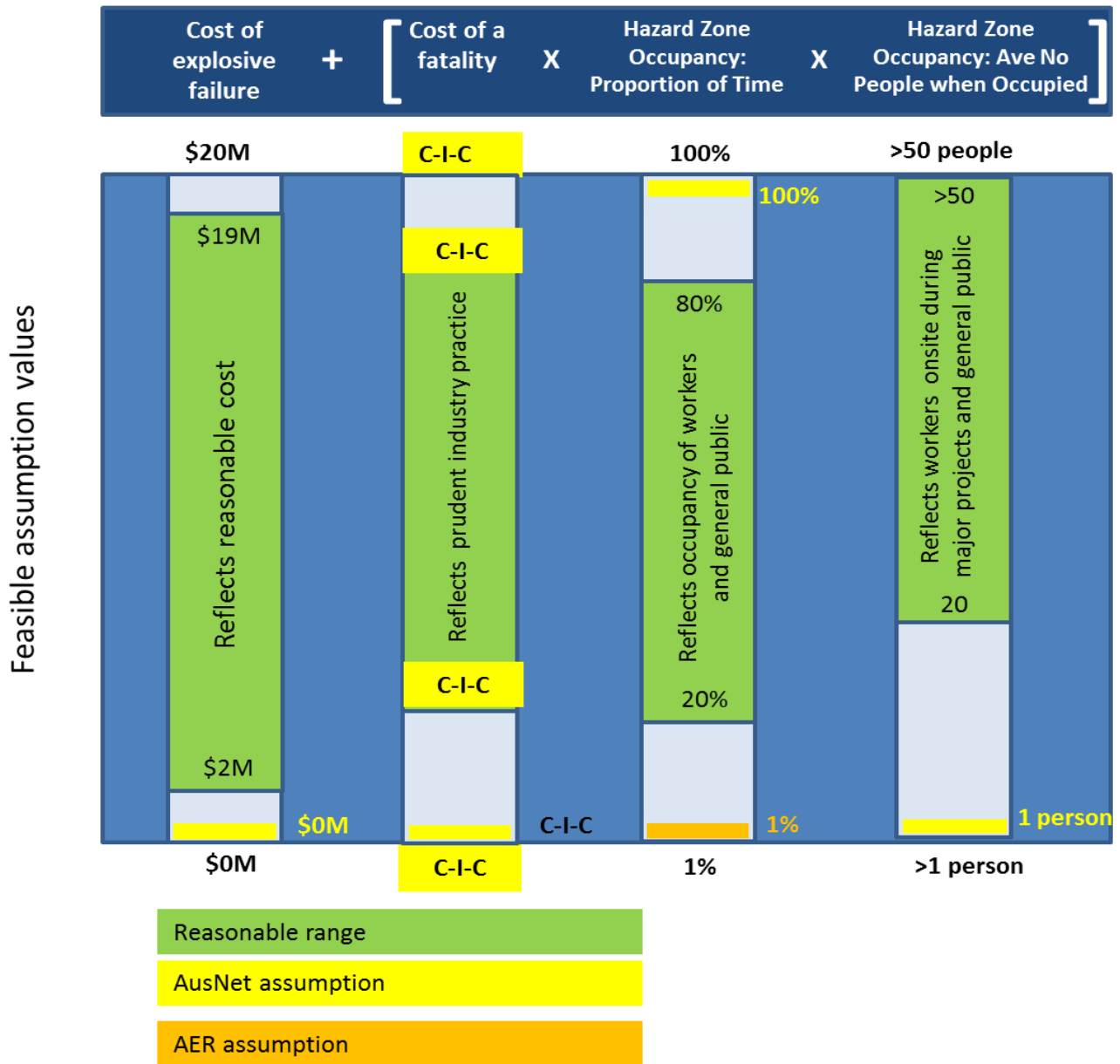
AusNet Services submits that the approach to costing safety risk should be considered as an overall package. Given the necessary assumptions and judgements that must be applied in making an assessment of this nature, it is the reasonableness of the overall approach that must be considered, not an individual assumption.

There are interactions between various inputs into costed safety risk, including any 'HZO Rate' parameter and risk consequence parameters that are applied. While there may not be a person within the hazard zone of an asset 100% of the time, there are likely to be multiple people within the hazard zone of an asset at various times. This could be due to the staffing requirements of a major replacement project, or the general public using a train line that is passing by a Terminal Station. Because the current risk consequence value applied does not capture the cost of multiple fatalities, reducing the risk cost due to site occupancy (which ignores risks to the general public) without making a corresponding increase to the risk consequence parameter would be inappropriate.

There are many ways to further disaggregate the approach to costing safety risk. The Figure below presents a possible range of values for the parameters that could form part of a disaggregation of the risk consequence and implicit 100% HZO Rate, currently applied in AusNet Services' approach.

It would also be possible to further disaggregate the equation, further increasing the complexity by including additional layers of analysis. It is only worthwhile increasing the complexity of the approach where the benefit of increased accuracy in valuing safety risk is high enough to warrant this (i.e. the principle of parsimony should apply).

Figure 3.9: Disaggregation of AusNet Services’ Risk Consequence



This Figure illustrates that a safety risk assessment methodology should be considered as a package, rather than focusing on one element in isolation. Altering a single element without considering the implications in the context of the overall approach would not achieve a balanced outcome. Each input has a range of possible values (discussed in more detail below). AusNet Services’ current risk consequence, and implicit 100% HZO Rate, gives a value of C-I-C. This is at the bottom of the range of values that can be arrived at by combining the feasible ranges of the parameters shown above.

While AusNet Services accepts it has adopted a conservative value in relation to the single parameter the AER has adjusted, it should be recognised AusNet Services has applied much less conservative values for the other three parameters. Overall, AusNet Services’ approach is reasonable and balanced when the four parameter values are considered together. Indeed, it is possible that a review of each input could conclude that AusNet Services’ current approach may understate safety risk.

AusNet Services understands that some other TNSPs’ approaches to assessing safety risk may include an explicit HZO Rate below 100%, but, where this is the case, higher consequence

values are applied. This indicates that the outcome of AusNet Services' approach is in line with industry standards.

Each of the parameters and the estimated ranges are explained below.

Cost of Explosive Failure

These economic costs would be incurred following an explosive failure whether or not there is a fatality. Currently, AusNet Services' approach does not consider these costs. These may include:

- Cost of disruption to the project (project delay cost, need to install extra safety precautions). A reasonable estimate for this is around \$1m, based on the cost of the recent Richmond incident.
- Cost of investigating the incident (oil tests, tests on other assets in the same fleet). The cost of this will heavily depend on the types and number of assets requiring investigation, but a reasonable range is \$50,000 to \$80,000.
- Cost of accelerating the replacement of like plant at risk of similar failures at this and other sites. This will depend heavily on the types and number of assets that require accelerated replacement. A reasonable estimate is \$0.5m to \$1m.
- The significant increase in supply risk should site access be restricted following an explosive failure and potential fatality, and normal restoration activities on site not be possible. The monetised supply risk could be as high as \$15m for critical plant such as 66 kV bus tie circuit breakers at older terminal stations that does not have remote operated 66 kV isolators such as Springvale Terminal Station (SVTS).
- Cost of supply risk associated with accelerated replacement of like plant (to address safety risk) as working in the vicinity of live like plant is unlikely to be possible. Plant outages may be the only option to allow operators on site and would require work to be undertaken during the night time when demand is at lower levels, but would still increase the monetised supply risk with up to \$1m for critical plant.
- Emergency management costs including:
 - Time spent by senior management and engineering specialists investigating the incident;
 - Time spent cleaning up after the incident; and
 - Communicating with necessary authorities.

A reasonable estimate of emergency management costs is \$0.2m to \$0.5m.

GHD advises that including these costs would further refine the approach to quantifying safety risk in the future.³⁶

Cost of a Fatality

AusNet Services' assumed statistical value of a life is based on a 2008 Australian Government assessment.³⁷ In 2010 Australian Standard 7000 – Overhead Line Design – Detailed Procedures has been published which is directly relevant to the electricity industry, and includes a statistical value of a life of \$10m. Any refinement to AusNet Services' methodology should apply data of most relevance to the electricity industry.

A disproportionality factor is applied to the value of a statistical life to reflect the obligation to address safety hazards up to the point that the costs of remediation become grossly

³⁶ Appendix 3A – GHD, *Risk Engineering Expert Advice – Safety Risk Quantification Report*, September 2016, p. 9.

³⁷ Best Practice Regulation Guidance Note – Value of statistical life, Department of Finance and De-regulation, Australian Government, November 2008.

disproportionate to the benefits. This factor is applied to a value of a single life and does not capture the potential for multiple fatalities to occur. The disproportionality factor currently applied by AusNet Services is 3; however, a value in excess of 3 may be appropriate to take into account the potential loss of a life of a member of the general public. A review of AusNet Services' safety risk assessment methodology would include reconsidering this disproportionality factor.

In addition, the economic costs of an incident resulting in multiple fatalities may not increase in a linear fashion in line with the number of fatalities. An incident involving several fatalities may have a disproportionately higher consequences as more thorough investigations and reviews would be required, higher legal fees and potentially substantial fines would be incurred. Multiple fatality events in other industries (such as mining) demonstrate the highly undesirable impact of such events. The costed implications of these events do not fit neatly within this parameter, but could form part of a more detailed analysis.

Hazard Zone Occupancy: Proportion of Time

This reflects the proportion of time that the Hazard Zone is occupied by at least one person. AusNet Services' current approach implicitly values this to be 100%. A precise value of this for each site has not been estimated here, but:

- Occupancy during a major replacement project is most relevant for this analysis. During these periods, the site will be occupied during working hours and some weekends; and
- General public occupancy should be included. The terminal stations at which major replacement projects are proposed are located in metropolitan Melbourne. As these border public areas including train lines, freeways and business estates, occupancy of close to 100% is not unrealistic. However, for other locations, GHD has concluded that a general public occupancy rate is reasonable based on some general assumptions.

Accounting for the increased likelihood that an explosive failure will occur during working hours, rather than at night (see Section 3.4.2.2) may also be relevant in quantifying this parameter.

Hazard Zone Occupancy: Number of People in HZ when Occupied

Between 20 and 50 workers will present on site during a major replacement project. At peak times during the largest rebuilds (e.g. at Richmond Terminal Station), this number can rise to 120. An explosive failure causing multiple fatalities is a risk that is not captured in AusNet Services' current methodology or in the AER's proposed approach. Evidently, an assumption that only one fatality could occur will, of itself, underestimate the expected safety cost.

In addition, the number of members of the general public likely to be within the hazard zone should also be taken into account. Given the major replacement projects proposed are located at terminal stations within metropolitan Melbourne, this number could be relatively high (e.g. where hazard zones include a major freeway or train lines it could easily exceed 20 to 30 people).

Conclusion on AusNet Services' overall valuation of safety risk

AusNet Services' overall valuation of safety risk is appropriate. In fact, a number of elements of AusNet Services' safety risk assessment methodology indicate that AusNet Services may currently understate safety risk (offsetting any perceived conservatism).

AusNet Services agrees that an occupancy rate of 100% appears high if assessed in isolation. However, a review of our safety risk assessment approach should, at least, examine all four parameters presented above. It should also recognise any inherent limitations of the approach – including the difficulty of capturing risks to the general public.

In terms of recent evidence, the explosive failure at Richmond since the submission of our Revenue Proposal provides clear evidence that our safety risk assessment methodology is not overly conservative. It also provides an example of the significant risks to the general public of explosive failure, which is disregarded in the AER's adjusted methodology.

AusNet Services provides the above information to demonstrate to the AER that its current approach to costing safety risk, as a package, does not lead to inefficient outcomes. This shows that AusNet Services' approach is supported by the NEO and the revenue and pricing principles. If such a review resulted in a reduction in the 100% occupancy rate (consistent with the AER's Draft Decision), compensating adjustments would also need to be made to the other elements of the methodology.

There is insufficient time for AusNet Services to undertake a comprehensive review of the risk assessment methodology before the AER makes its Final Decision. However, AusNet Services is committed to undertaking a review to determine whether its approach could be improved and refined in the future. It is evident from the information presented above, however, that the analysis presented in the Draft Decision does not support the conclusion that AusNet Services' current methodology is unreasonable.

The consequences of a change to AusNet Services' safety risk assessment would also need to be carefully considered. If it were not, there may be very serious consequences for the safety of our staff and the general public. In addition, AusNet Services' economic planning criteria assume that safe site access for multiple crews is always possible. This assumption allows for fast restoration times following equipment faults on the basis that site access will never be restricted. These planning criteria will need to be revisited if the frequency of explosive failures were to increase. This would increase monetised supply risk.

3.4.2.5 Other Practical Matters for Consideration in the Final Decision

Section 3.4.2.5 describes the following practical considerations to assist the AER in making its Final Decision:

- The benefit of enabling brownfield projects to continue;
- How safety controls are factored into AusNet Services' planning approach; and
- The West Melbourne Terminal Station rebuild is a committed project.

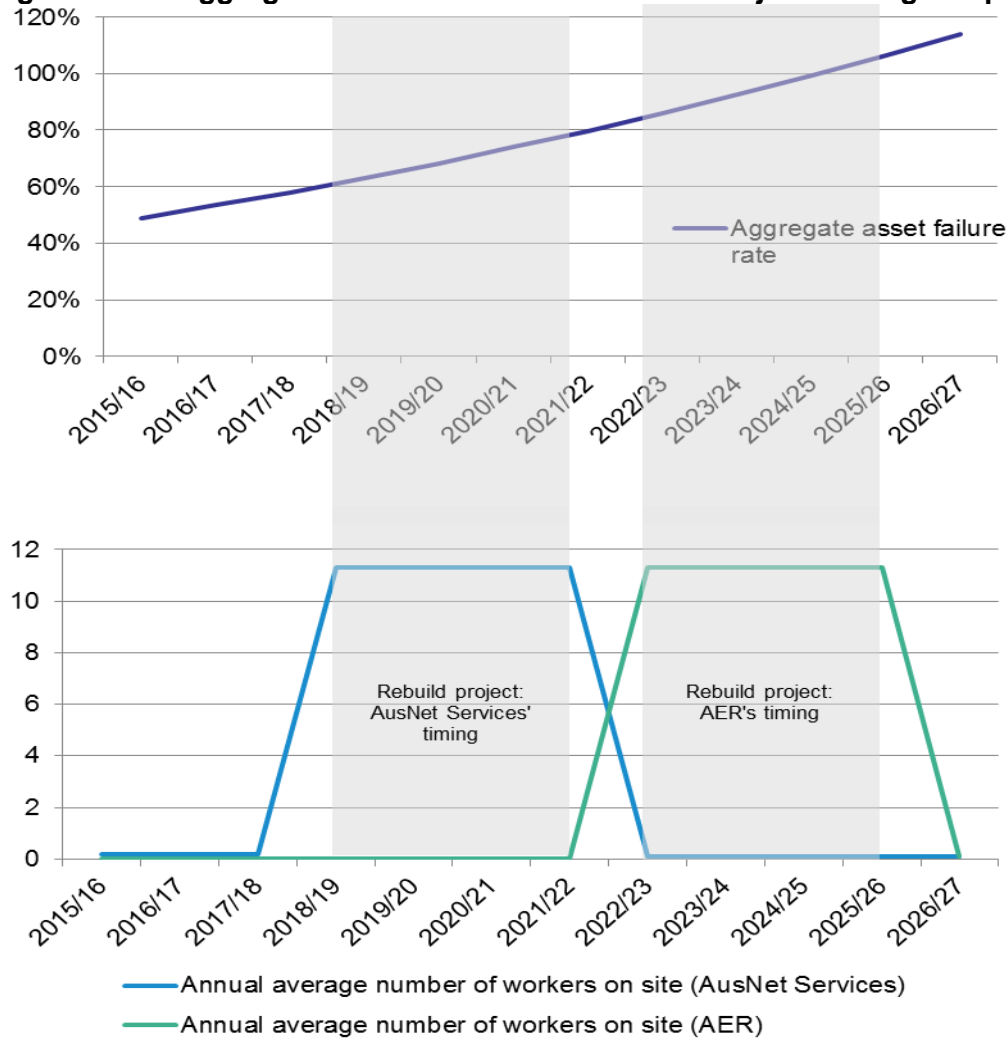
Continuing to enable brownfield replacements to minimise project costs

As discussed above, AusNet Services is obliged to minimise risks and hazards to its workforce as far as practicable. This includes during major replacement projects.

As explained above, the combination of the elevated risk of asset failure occurring towards the end of an asset's life and the need for additional workers to be on site during this period, as maintenance and replacement needs increase, results in heightened safety risk. This results in rapidly increasing risks when projects are deferred.

This is demonstrated in the Figure below, which shows aggregate asset failure rates at Springvale Terminal Station, the annual average number of workers that are expected to be on site to deliver the rebuild project under the timing proposed in AusNet Services' Revenue Proposal, and the economic timing implied by the AER's Draft Decision. The aggregate asset failure rate, and therefore the risk to workers, and to the general public, would increase by a third under the AER's timing compared to AusNet Services' proposed project timing.

Figure 3.10: Aggregate Asset Failure Rates and Project Timing – Springvale Rebuild



The deferral of replacement works that would arise from the Draft Decision’s safety assessment would have serious practical consequences. Specifically, it will be impossible to work near high risk plant while it is energised without exposing workers to unacceptable safety risks.

A worker or member of the public need only be in the vicinity of an asset *at the time* it fails for this small risk to materialise. While hindsight is not available to the AER when it makes decisions, the negative public perception for AusNet Services (and the AER if it were to ostensibly require a reduction in safety standards) that would follow a material safety incident as a consequence of adopting a lower safety standard is not tolerable, and neither should it be for the AER.

The proposed major replacement projects include replacing assets currently operating beyond the end of their originally assumed technical lives. If the condition of these assets were to deteriorate further, the proposed major replacement projects may not be able to proceed in their current form. In this case, the remaining options that may be available include:

- Undertake brownfield replacements with enhanced safety precautions, which may include installing barriers around the most at-risk assets (around 20 to 40 assets may be impacted). The limitations of this approach include increased project costs, availability of space on site to install barriers, the impact space restrictions will have on project deliverability, and the effectiveness of these barriers. An assessment would need to be carried out to determine whether this approach would be consistent with AusNet Services’ legislative obligations to eliminate, rather than control, the hazard as far as is practicable.

- Undertake brownfield replacements by de-energising the most at-risk equipment for long periods of time, to enable workers to safely occupy the site. The limitations of this approach are that the network does not have capacity to enable assets to be switched off for very long periods of time without substantial reliability risk being incurred. The Victorian transmission network has been built based on probabilistic planning and does not have the level of built in redundancy to enable prolonged transmission outages to be taken. The cost of energy unsupplied to the community would be unacceptably high.
- Undertake greenfield replacement projects. This option involves rebuilding the Terminal Station at a brand new site (which would be safe to work on), and then transferring load from the old site to the new site. Greenfield replacement projects are extremely expensive (typically three times the cost of a brownfield option) and are also limited by the availability of land, particularly for metropolitan terminal stations. Greenfield asset replacement has been assessed and is not economic compared with AusNet Services' planned brownfield replacement program, and thereby undermines the achievement of the NEO.

The Box below discusses the implications of a brownfield replacement option becoming infeasible at West Melbourne Terminal Station. Appendix 3D sets out why the options set out above are not realistic for all major replacement projects proposed.

Box 3.4: West Melbourne Terminal Station – No Brownfield Replacement

If the current (committed) brownfield rebuild of WMTS were deferred beyond 2026-27 to reflect the AER's change to AusNet Services' safety risk assessment, the safety risks presented by existing assets would be too high to enable the assets to be replaced and continue to operate without modifying the project to account for heightened safety risks.

The following options would be available:

- **Implement safety precautions.** These include:
 - Barricading assets with the highest explosive failure risk. This would severely impede the space required to deliver the rebuild, given the number of high risk assets. This will also require longer supply restoration times, increasing supply risk.
 - Restricting site access. As WMTS contains legacy assets that must be operated manually, access to the site is required to ensure the ongoing operation of the site. In addition, in the event of a fault, safe access is required to restore supply.
- **De-energise the most at-risk equipment during the replacement project.** This would increase supply risk beyond economic levels. The duration of outages that would be required over the course of the 6 year rebuild would pose an unacceptable risk to the security of supply to Melbourne's CBD for a long period of time.
- **Undertake greenfield replacement project.** A greenfield option was considered for the WMTS rebuild and submitted to the AER for consideration during the previous transmission reset. However, neither AusNet Services nor the AER deemed this option to be economic. A greenfield rebuild costs approximately three times as much as a brownfield replacement project. The rebuild would need to be deferred by 15 years before the present value of the project's capital cost were to be equivalent to the cost of a brownfield replacement today. During these 15 years, the highest risk assets would still need to be replaced if the site were to remain operational during this time. The cost of this replacement activity should be added to the cost of the greenfield project. AusNet Services considers that a greenfield solution for WMTS will never be the most economic solution for customers.

How Safety Controls are factored into AusNet Services' Approach

The Draft Decision summarises the safety risk controls used by AusNet Services.³⁸ The discussion links the quantification of risk to the likelihood of risk materialising and states that likelihood is dependent on controls in place. The AER then provides a list of risk controls and programs that AusNet Services has in place which are assumed to mitigate safety consequences.

While safety controls are an important part of risk management, AusNet Services' is legally obliged to eliminate where practicable, rather than control, hazards or risks to workers and the general public. Therefore, where it is economic to reduce explosive failure risk, AusNet Services is obliged to do so, regardless of the availability of risk controls. AusNet Services considers that the approach it applies to quantifying safety risk eliminates the hazard to the point at which it is practicable to do so.

This legislative requirement endures despite the AER's Draft Decision. AusNet Services would necessarily then pursue the fulfilment of its legal safety obligations without being appropriately funded to do so. This, in turn, would result in a failure of the pricing principles enshrined in sections 7A(2) and (3) of the NEL.

AusNet Services is not prepared to take responsibility for reducing this standard of safety. If such a diminution is imposed, this is a policy decision that ought to be widely canvassed and publicised as it is a matter of public policy.

As recognised by the AER, AusNet Services does employ a range of safety risk controls and these controls do mitigate risk. However in the specific case of major replacement projects and terminal station rebuilds the aim is to replace assets in deteriorated condition before a potentially explosive failure occurs. Most of the risk controls listed by the AER do not reduce the safety consequences of an explosive failure. In addition, where the controls listed reduce the probability of an explosive failure occurring (e.g. condition assessments influence the risk of safety-related failures), they have already been factored into our economic analysis via asset failure rates.

The following table summarises the controls in place and comments on how these controls have contributed the AusNet Services analysis for the timing of the major replacement projects.

Table 3.6: Effectiveness of AusNet Services' Risk Controls

Risk Controls Listed by the AER	Relevance to Major Replacement Projects
Employee safety training, safe working practices and personal safety equipment such as pocket sized electromagnetic frequency devices for personal protection and warning. ³⁹	Safety training and work practices will not protect employees or the general public against explosive failure of deteriorated assets. Safe work practices would require an exclusion zone around high risk assets which would prevent a brownfield (lowest cost) major replacement project.
Installation of fall arrest systems and maintenance access systems on station racks and transformers. ⁴⁰	Fall arrest and access systems will not protect employees or the public against explosive failure of deteriorated assets.
Insulator replacement and condition monitoring programs, and increased use of non-ceramic insulators with non-hazardous failure modes. ⁴¹	Replacement programs will not protect employees or the public against explosive failure of deteriorated ceramic assets that have yet to be

³⁸ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 49.

³⁹ AusNet Services, *AMS 10-13 Condition Monitoring*, 16 September 2015, p. 17.

⁴⁰ AusNet Services, *Appendix 4A: Network Capital Expenditure Overview – 2017 to 2022*, 30 October 2015, p. 38.

Risk Controls Listed by the AER	Relevance to Major Replacement Projects
	replaced.
Terminal station infrastructure security, including fencing, CCTV surveillance, lighting and access control to prevent unauthorised access to terminal station areas. ⁴²	This control will not protect employees or the general public located within asset hazard zones against explosive failure of deteriorated assets.
Fire protection systems, designed to extinguish fires which may ignite around terminal station assets or in station buildings. ⁴³	Fire protection systems mitigate risk after an asset has failed and has started a fire. This risk control will not protect employees or the public against explosive failure of deteriorated assets.
The application of modern, safe station design, including separation of control buildings from switchyard areas and the installation of sound and blast walls, railings and fall arrest systems. ⁴⁴	<p>The terminal stations proposed for major replacements or rebuilds are not modern stations. The stations have been in service between 40-60 years.</p> <p>The proposed program is to rebuild these stations, or carry out major replacement projects, which will incorporate modern safety standards and designs. This will reduce safety risk in future.</p>
Condition monitoring and diagnostic testing such as oil testing and dissolved gas analysis, moisture and sulphur dioxide checks, and real time online monitoring of circuit breakers, capacitor voltage transformers and power transformers which assists in both avoiding imminent failures and developing trends for failure probability. ⁴⁵	<p>The information gathered from condition monitoring and testing has informed the condition assessment and failure risk used in the analysis to support the major replacement projects.</p> <p>This risk control has informed the decision to replace deteriorated assets.</p>
De-energising equipment during planned refurbishment, maintenance and testing work. For example, AusNet Services undertakes the following condition monitoring work while equipment is off-line: power transformer condition monitoring, circuit breaker interrupter contact resistance tests, circuit breaker operating time tests, motor testing on motorised disconnectors, and insulator voltage tests. ⁴⁶	AusNet Services' transmission network does not have sufficient redundancy to de-energise the whole terminal station in order to rebuild or deliver major replacement projects. If assets are allowed to deteriorate to the point where de-energising the whole station was required to access site this would result in significant and widespread supply interruptions across the network, resulting in a high cost of unsupplied energy to consumers.
<p>Use of portable and fixed radio frequency (RF) partial discharge scanners to identify faults and impending failures on substation equipment:</p> <ul style="list-style-type: none"> AusNet Services described RF scanning as 'the most powerful technique available to date to avoid potential explosive or 	<p>Portable scanning equipment is used to monitor and assess asset condition. Condition assessment is one of the key inputs to the analysis which supports the terminal station rebuilds.</p> <p>RF scanners provide an indication of asset</p>

⁴¹ AusNet Services, *Appendix 4A: Network Capital Expenditure Overview – 2017 to 2022*, 30 October 2015, p. 39; and AusNet Services, *AMS 10-13 Condition Monitoring*, 16 September 2015, p. 18.

⁴² AusNet Services, *Appendix 4A: Network Capital Expenditure Overview – 2017 to 2022*, 30 October 2015, p. 44.

⁴³ AusNet Services, *Appendix 4A: Network Capital Expenditure Overview – 2017 to 2022*, 30 October 2015, p. 43.

⁴⁴ AusNet Services, *Appendix 4A: Network Capital Expenditure Overview – 2017 to 2022*, 30 October 2015, p. 19.

⁴⁵ AusNet Services, *AMS 10-13 Condition Monitoring*, 16 September 2015, pp. 10-11.

⁴⁶ AusNet Services, *AMS 10-13 Condition Monitoring*, 16 September 2015, p. 10.

Risk Controls Listed by the AER	Relevance to Major Replacement Projects
<p>hazardous failures impinging network reliability and people safety'.⁴⁷</p> <ul style="list-style-type: none"> AusNet Services submitted that portable RF scanning has been used extensively in the current regulatory control period to avoid potential explosive failures and ensure safe working areas for maintenance and augmentation projects.⁴⁸ AusNet Services has also developed a fixed RF monitoring system capable of detecting partial discharge activity across an entire terminal station, non-intrusively and on a 24 hour / 7 day basis. This technology is in place at the Springvale terminal station, and will be deployed at other terminal stations where major work is planned, which are the highest risk sites due to asset age, condition and worker exposure.⁴⁹ 	<p>condition, they do not protect employees or the public from an explosive failure unless the person is excluded from the risk zone. If the person were not present in the risk zone, brownfield (lowest cost) terminal station replacements would be unable to proceed.</p> <p>RF scanners are not 100% reliable in predicting explosive failures. Explosive failures have not always been detected in advance, despite the use of RF scanners.</p> <p>Reliance on RF scanners to mitigate the impact of an explosive failure will not satisfy the obligation to <u>eliminate</u> the hazard.</p>
<p>The overall purpose and effect of the measures outlined above is to, in various ways, mitigate or eliminate safety risks and maintain a safe working environment for employees. Practically, these measures have the effect of both:</p> <ul style="list-style-type: none"> Reducing the need for employees to work in close proximity to potentially hazardous equipment, thereby reducing the hazard zone occupancy rate (for example, through the use of non-invasive station scanning and remote operations); and Making the potentially hazardous zone safer (for example, by de-energising equipment, providing advanced warning of possible asset failure or through the use of specific safety equipment). 	<p>The risk controls listed are designed to reduce risk during the normal life and operation of network assets over approximately 50 years of service.</p> <p>However, the brownfield replacement projects require large numbers of employees and contractors to be onsite in close proximity to assets for long periods of time during the project period.</p> <p>The fact that many of these risk controls cannot be applied during a major replacement project and/or do not protect employees or the public from explosive failure of deteriorated assets, reinforces the requirement for major replacement projects to be completed in a timeframe before the risk of explosive failure becomes so great that exclusion from the site is the only palatable risk control. Exclusion from site removes the lowest cost option of brownfields rebuild.</p>

In summary, the risk controls outlined by the AER may mitigate risk during the normal life and operation of the terminal station assets. However, once the assets enter a stage where deterioration levels make an explosive failure likely, these standard risk controls do not provide sufficient mitigation of the risk. At this point the best (and required) risk management option is to eliminate the risk by removing the asset and replacing. This is consistent with AusNet Services' economic project assessments, which have taken into account the available risk controls.

⁴⁷ AusNet Services, *AMS 10-13 Condition Monitoring*, 16 September 2015, p. 13.

⁴⁸ AusNet Services, *AMS 10-13 Condition Monitoring*, 16 September 2015, p. 12.

⁴⁹ AusNet Services, *AMS 10-13 Condition Monitoring*, 16 September 2015, p. 15.

The West Melbourne Terminal Station Rebuild is a Committed Project

The West Melbourne Terminal Station rebuild is a committed project which is underway.⁵⁰ However, the AER has treated the West Melbourne Terminal Station rebuild as a project that is not yet underway, and has made a significant (45%) reduction to its forecast capital costs.

Preparatory work has commenced on site at West Melbourne and active tender processes are currently being carried out for major equipment. These tender processes form part of the critical path that must be met to deliver the project within the required timeframe. In addition, by the end of the 2014-17 regulatory period, around \$20m (\$2016-17) will have been spent on the WMTS rebuild and be included in AusNet Services' RAB. If the project is deferred beyond its current timing, customers will not realise value from this expenditure.

In the Final Decision for AusNet Services 2014-17 regulatory period, the AER accepted that 'we agree with SP AusNet the WMTS needs to be rebuilt, given its age and condition'.⁵¹ This was based on the advice of its technical consultants, which stated:

"Three of the four 220kV transformers are some of the highest risk transformers in the network. The fourth transformer is in good condition with an estimated 30 years remaining life. Recent condition assessments indicated that most switchgear needs replacement. Most of the circuit breakers, instrument transformers and other equipment in the station is unreliable and/or poses a significant risk to safety of personnel and adjacent equipment."⁵²

AusNet Services' economic assessment of the WMTS rebuild was based on exactly the same safety assumptions as it has applied in the Revenue Proposal for the 2017-22 regulatory period. These were not challenged in 2014 and the AER agreed that these ageing assets did need to be replaced. As such, the AER's Final Decision included an allowance of \$69.0m (\$2016-17) for the WMTS rebuild over the 2014-17 regulatory period, based on a total project cost of \$171m.

Neither the age nor the condition of the assets at WMTS have improved since 2014; in fact, as expected, both have deteriorated.

In addition, AusNet Services has worked to find a much more efficient solution for the WMTS rebuild. This has been possible because:

- Falling demand forecasts have enabled the project to be deferred;
- Space constraints on the site have eased, due to:
 - Citipower's plans to retire its 22kV network, meaning there is no need to rebuild these assets;
 - The cancellation of the East West Link project; and
 - A key easement has been leased from VicTrack until 2019.
- As set out in our Revenue Proposal, the WMTS rebuild has been redesigned to use Air Insulated Switchgear, rather than Gas Insulated Switchgear. This has significantly reduced forecast project costs by approximately \$90m. AusNet Services has now begun to deliver this more efficient solution.
- However, the Draft Decision states that the safety risk of the major stations projects, including West Melbourne, has been overestimated. This is contrary to the AER's view in 2014 on the need for the WMTS to be rebuilt. Given the magnitude and complexity of the WMTS rebuild project, the Draft Decision results in a high degree of regulatory uncertainty over this committed project. This is highlighted in the Table below, which shows the evolution of the forecast, and allowed, costs of the WMTS project over the last four years.

⁵⁰ AusNet Services, *2017-22 Revenue Proposal*, p. 86, Table 4.8.

⁵¹ AER, *Final Decision 2014-17 SP AusNet*, p. 77.

⁵² EMCa, *Report to AER*, August 2013, p. 54.

Table 3.7: WMTS Forecast and Allowed Expenditure

\$m, real 2016-17	October 2013 – AusNet Services’ Revised Revenue Proposal 2014-17	January 2014 – AER Decision 2014-17	Final 2014-17	October 2015 – AusNet Services’ Revenue Proposal 2017-22	July 2016 – AER Draft Decision 2017-22
Total project cost estimate	Total project cost of \$171M proposed, with \$69M to be incurred in the 2014-17 regulatory period	Proposed 2014-17 expenditure reduced by 7% due to a cost estimation bias adjustment		Total project cost of \$126M proposed, with \$104M to be incurred in the 2017-22 regulatory period	Proposed 2017-22 expenditure reduced by 45% due to safety and reliability risk and cost estimation bias

The Draft Decision recognises that there may be special considerations that should be taken into account due to interactions with Citipower’s plans to decommission its 22kV network. This is indeed the case. Citipower plans to shift 11.7MW of load from its 22kV network onto the 66kV assets at West Melbourne by summer 2018-19, and a further 43.6MW of load onto the 66kV assets by summer 2020-21. After this time, it will be far more difficult to take outages of the 66kV network without suffering reliability impacts.

The site will also need to be safe to allow access to decommission Citipower’s 22kV assets. If the West Melbourne rebuild were not to continue, an assessment would be required to ensure that the condition of assets within the proximity of Citipower’s 22kV assets did not present an unacceptably high safety risk.

In addition, the lease that AusNet Services has secured from VicTrack to enable project delivery expires in 2019. Access to this critical piece of land has been key to enabling a far more cost efficient project (using Air Insulated Switchgear (AIS), rather than Gas Insulated Switchgear (GIS)) to be delivered.

Unless the West Melbourne Terminal Station rebuild can be completed by 2022, the project as currently designed and committed will not be able to be delivered. The increase in load on the 66kV network means that the project sequencing will have to be reassessed, and will likely increase the duration and complexity of the project, increasing costs. In addition, the loss of the VicTrack easement reduces the space available on site during the project construction. Again, this will impact the project sequencing and may jeopardise AusNet Services’ ability to deliver the rebuild using AIS, rather than more costly GIS, equipment.

Given the importance of providing regulatory certainty about the funding for large scale transmission rebuilds that are committed projects, and the narrow window available to AusNet Services to deliver the lowest-cost solution, AusNet Services would welcome further engagement with the AER on this matter.

3.4.2.6 Additional Principles for Consideration in the Final Decision

Section 3.4.2.6 describes the following principles to assist the AER in making its Final Decision:

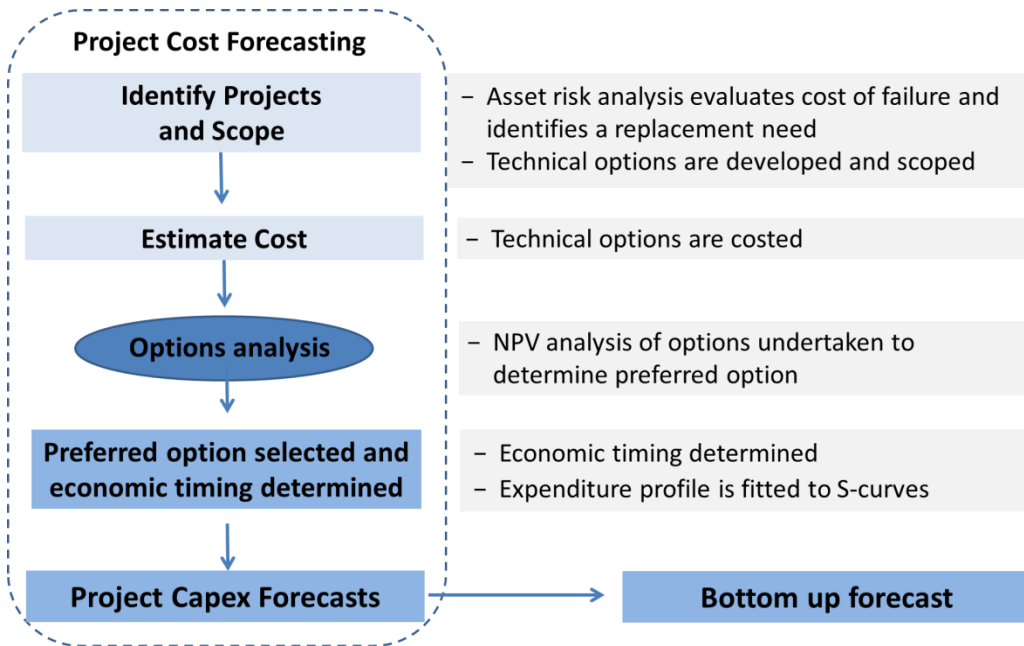
- The AER’s substitute forecasts do not reflect feasible projects;
- The application of the AER’s safety adjustment to programs of works; and
- The AER’s obligations under the National Electricity Rules.

Substitute forecast does not reflect feasible projects

The AER has praised AusNet Services’ economic planning approach as being consistent with good industry practice. However, in adjusting safety risk, it has misapplied AusNet Services’ approach so that the resulting substitute forecast is baseless.

AusNet Services’ economic planning approach employs the steps shown in the Figure below.

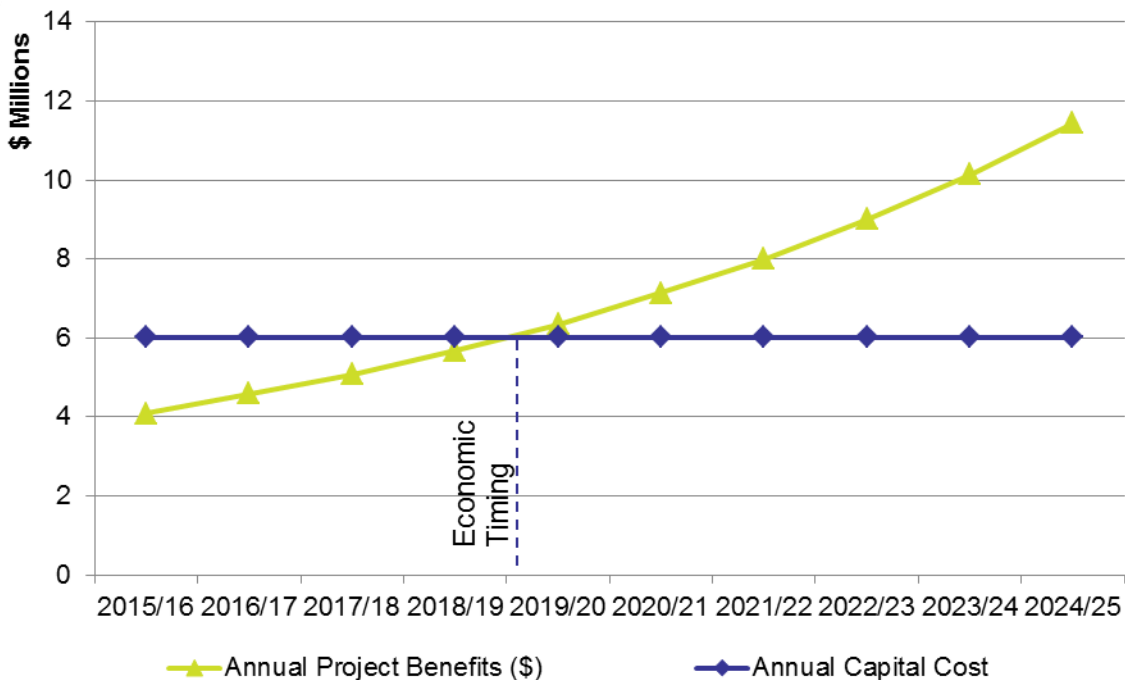
Figure 3.11: Economic Planning Approach – Forecasting Methodology



As explained in the Revenue Proposal, project options to address asset risk are identified. These options are then assessed using NPV analysis to determine the most cost-effective (or preferred) option. The economic timing of the preferred option is then determined at the point where the expected economic benefits of the project exceed the project costs.

For example, the Figure below shows how the economic timing of the Springvale Terminal Station rebuild project was determined.

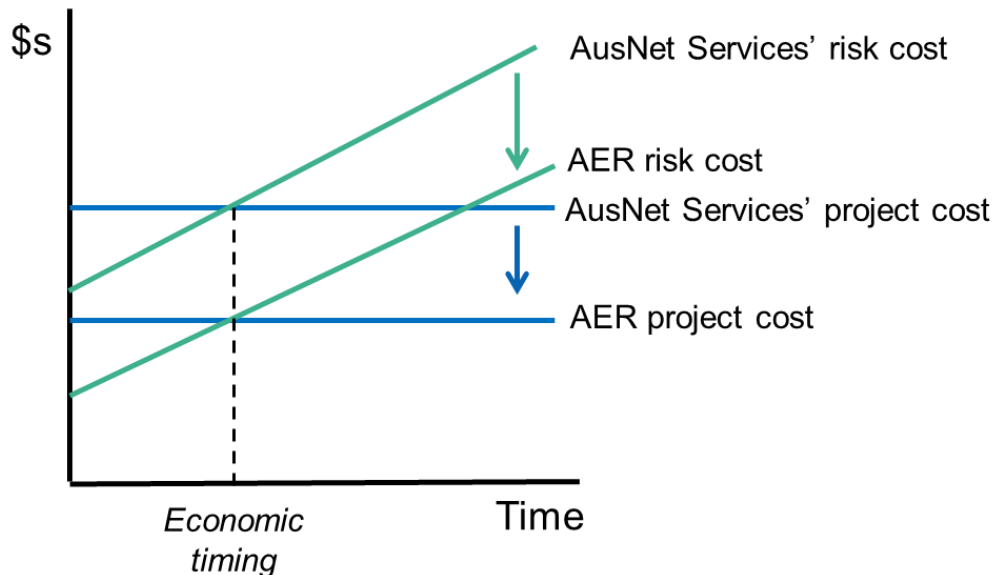
Figure 3.12: Economic Timing of Springvale Terminal Station



Under our approach, a reduction in quantified risk would shift the annual project benefits downwards and result in a deferral of the economic timing of the project – that is, the Springvale Terminal Station rebuild would not be economic until a later date.

The AER's Draft Decision has reduced our quantification of safety (and also reliability) risk. However, rather than applying AusNet Services' methodology which would defer the project, it has reduced the proposed project costs (i.e. shifted the annualised capital cost curve downwards) to align with the level of quantified risk that it considers would be present at the time AusNet Services originally determined it would be economic to deliver the project.

Figure 3.13: The AER's Application of AusNet Services' Economic Planning Approach



The AER considers that the adjusted risk costs could justify a reduced scope of work in the 2017-22 regulatory period.⁵³ It has not fully explained its rationale for this approach. AusNet Services considers that this approach is unreasonable for the following reasons:

1. Transmission asset replacement projects are large, costly and lumpy. They involve the replacement of large assets, at a cost of several millions of dollars each. The proposed major replacement projects are not perfectly scalable to align to the allowance provided by the AER. Therefore, the allowance provided by the AER is disconnected from the scope and forecast expenditure included in AusNet Services' Revenue Proposal in relation to these projects.
2. Any reduction in the project scope would not deliver the full benefits that are assumed when quantifying the risk cost. It is critical that the risks and costs of a consistent and defined project scope are assessed as part of this analysis.
3. AusNet Services has already considered the economics of staging the major replacement projects that form part of its Revised Revenue Proposal and concluded that staging does not represent the most efficient solution for these projects. Where staging is the most efficient solution then a staged approach is adopted by AusNet Services.⁵⁴

Under the NER, the AER is required to provide AusNet Services with a reasonable opportunity to recover its efficient costs. However, the way that the AER has applied AusNet Services' economic analysis to set the appropriate capex allowance does not achieve this. The AER's approach derives a baseless project cost, to address risks that were to be addressed by a project scope proposed by AusNet Services, which has been deemed to be inefficient by the

⁵³ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 54.

⁵⁴ For example, refer to the FBTS planning report (p.7) which highlights that the proposed FBTS replacement project is the second stage of the station's redevelopment.

AER. The AER's allowance will not enable these benefits to be achieved and therefore the way the AER has applied this approach is circular and unreasonable.

Advice from Geoff Swier confirms:

“By not adopting the analysis stages used by AusNet Services to derive the original capital expenditure program, the AER is likely to have both underestimated and overestimated components of the downward adjustment for the forecast project-based replacement capex over the regulatory period. Given the significance of the major station capital program, the likely level of forecast inaccuracy arising from the AER adjustment approach provides a low level confidence that the AER's capital expenditures forecast:

- will provide expenditure allowances that reflect feasible major station projects that could be constructed by AusNet Services in practice;*
- and that the capital expenditure forecasts will meet the capital expenditure criteria.”⁵⁵*

The lumpy nature of transmission projects means that the AER's approach to determining the capital expenditure forecast introduces regulatory risk. It is clear that the Draft Decision does not provide sufficient allowance to deliver the full scope of capital works proposed by AusNet Services. Almost half of AusNet Services' capex forecast comprises a small number of major replacement projects. However, the Draft Decision has deemed the major projects as proposed to be inefficient and unwarranted.

If AusNet Services proceeds to deliver these projects to meet its safety obligations, it is exposed to a material risk that the AER will find the delivery of these projects to be inefficient in an ex post review. Despite the AER's statement that 'we do not determine which projects or programs the service provider should or should not undertake⁵⁶', it has explicitly deemed AusNet Services' proposed expenditure on all four major replacement projects to be inefficient. Geoff Swier considers that:

“AusNet Services will however need to make decisions about these major station projects during the next regulatory period, and cannot easily forecast the exact AER analysis of safety related cost drivers in an ex post review. The best assumption that AusNet Services can make is that the AER will apply the same safety cost approach that it determines in its final decision.”⁵⁷

Therefore, if AusNet Services were to deliver the full scope of any of these major replacement projects, it is unclear how the AER could conclude that this was efficient in an ex post review. This potentially results in the exclusion of capex from the RAB. This would undermine appropriate achievement of the NEO and revenue and pricing principles in the NEL. This illustrates the importance of the need for the capex forecast to be related to a proposed scope of works, rather than the approach adopted in the Draft Decision.

Application of Safety Adjustment to Programs of Works

In addition to adjusting the forecast major replacement project costs, the AER has also adjusted the forecast costs for programs of works. AusNet Services does not accept this adjustment, on the basis of the rationale set out above.

In addition, the AER's analysis of programs of works is based on a sample of just three projects: the circuit breaker replacement program, the groundwire replacement program and the instrument transformer replacement program. The AER found that its adjustment to safety risk cost impacts AusNet Services' economic justification of one of these three projects (the circuit breaker replacement program), and based on this has applied a reduction of 8.2% in direct costs across all network programs of works.

⁵⁵ Appendix 3F – Farrier Swier Consulting, *Independent advice on capex economic evaluation approach*, 19 September 2016, p. 10.

⁵⁶ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 15.

⁵⁷ Appendix 3F – Farrier Swier Consulting, *Independent advice on capex economic evaluation approach*, 19 September 2016, p. 15.

The AER stated that, in the case of instrument transformers, ‘AusNet Services’ model already included a factor to account for the probability of a person being in the hazard zone at the time of a failure event’.⁵⁸ The instrument transformer economic analysis did include a factor called ‘probability of a fatal accident’. However, as the AER points out, the value attributed to this assumption does not match the approach adopted in assessing other aspects of the capex forecast. AusNet Services has corrected this inconsistency, and an updated instrument transformer NPV analysis is provided as a technical supporting document to this Revised Revenue Proposal. This correction does not impact the preferred option.

The programs of works proposed by AusNet Services each have very different drivers. The AER recognises that:

“AusNet Services’ economic evaluation methodology including its assessment of the cost of safety risk is applied generally across its replacement capex forecasting. However, safety risk is unlikely to be a significant factor for some asset types which do not fail in an explosive or otherwise dangerous manner.”⁵⁹

While the AER is correct in stating that AusNet Services’ economic evaluation methodology is applied generally across its replacement capex forecasting, AusNet Services applies assumptions that are relevant to the costs and benefits of the specific program in question. For example, when assessing the civil works program, the costed safety benefits do not relate to reducing explosive failure risk, as a civil works program does not impact the risk of explosive failures.

These three programs are not representative of all proposed programs of works. The evidence provided by AusNet Services alongside its Revenue Proposal (i.e. the programs of works), and in this Revised Revenue Proposal demonstrate the three programs are not driven by the same safety risk assumptions as all programs of works. Further information on the drivers of each program of works is provided below to enable the AER to reconsider its assessment approach.

The programs of works and their drivers are outlined in the Table below.

Table 3.8: Programs of Works Exposed to Modified Safety Assumption

Program of Works	Main Drivers	Proposed Expenditure (Direct, \$m, real 2016-17)	Sensitive to Safety Assumption adjusted by the AER?
Power transformers – bushings replacements	Reliability, quality and security of supply, safety and environment, compliance	3.5	Yes.
Power transformers – life extension	Reliability, quality and security of supply, safety and environment, compliance	6.5	No. This program does not reduce explosive failure risk, but extends the serviceable life of power transformers.
Power transformers – improved safe access	Compliance, safety, reliability	2.6	No. This program does not reduce explosive failure risk, but ensures that workers are able to safely maintain power transformers.
Disconnectors	Compliance, safety,	11.1	No. This program does not reduce

⁵⁸ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 53.

⁵⁹ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 52.

Program of Works	Main Drivers	Proposed Expenditure (Direct, \$m, real 2016-17)	Sensitive to Safety Assumption adjusted by the AER?
			explosive failure risk, but ensures that workers are able to safely handle and maintain isolators and earth switches.
Reactive plant	Reliability, quality and security of supply, compliance	0.9	No. This program targets replacing reactive plants in very poor condition. Reduction of explosive failure risks is not addressed by this program of work.
On-line monitoring	Frequent assessment of asset condition to detect trends in deterioration and reduce the need for inspection	0.7	No. The justification of this program is not sensitive to the safety assumption the AER has adjusted. The program relates to the on-line condition monitoring of SF ₆ -filled circuit breakers (CBs), with the aim of extending the service period of CBs before they require a major overhaul, or replacement. The material risk of explosive failure is negligible in comparison to bulk oil breakers, and reducing the risk of a fatality due to an explosive failure is not a key driver of the program.
Fire protection systems	Compliance, safety	9.1	No. This program addresses the spread of fires and is required to comply with legislative obligations. Minimising the risk of explosive failures is not a key benefit of the program.
Civils	Compliance, safety	9.2	No. This program targets replacement of worst condition civil infrastructure assets. Civil infrastructure assets do not explode.
Infrastructure security	Compliance, safety	13.0	No. This program aims to improve the asset security of transmission assets. Reduction of explosive failure risks is not addressed by this program.
Structure fall arrests	Compliance, safety	0.9	No. Driven by a regulatory obligation to install fall arrest systems on towers. Costed safety risk does not factor into the benefits of this program.
Earth wires	Compliance, safety	19.8	No. This program does not reduce explosive failure risks as earth wires do not exhibit explosive failure modes. This program targets replacing worst condition earth wires in the transmission network.
Insulators	Compliance, safety	5.5	No. The safety benefits of this program does not relate to explosive failures, but

Program of Works	Main Drivers	Proposed Expenditure (Direct, \$m, real 2016-17)	Sensitive to Safety Assumption adjusted by the AER?
			to the risk of falling lines.
Towers	Reliability, compliance, safety	3.7	No. The benefits of tower replacements do not include reducing explosive failure risk as towers do not explode.
Tower arrests	fall Compliance, safety	22.5	No. The installation of fall arrest systems on towers is driver by a legislative obligation. The program is unrelated to explosive failures of assets located at terminal stations.
Secondary and protection program	Compliance, Obsolescence, modernisation	86.3	No. The benefits of replacing obsolete secondary assets do not include reduction of explosive failure risks.
Comms program	Compliance, safety, reliability	55.7	No. Communication assets do not exhibit any explosive failure modes, hence explosive failure risks are not relevant.
Comms – safety and security	Compliance, safety, reliability	3.9	No. This program does not address any explosive failure risks.

Only two programs of works (circuit breakers and power transformers – bushing replacements) are impacted by the safety assumption the AER has modified, which quantifies the benefits of a reduction in explosive failure risk. For the remainder of the programs listed in the Table above, minimising explosive failure risk does not form part of the benefits. Therefore, the notion of a ‘Hazard Zone Occupancy Rate’ in the event of an explosive failure has no place in justifying these projects, and the AER’s adjustment to AusNet Services’ safety approach is misdirected.

The conclusion drawn by the AER below should be reconsidered in its Final Decision:

“We consider that the weighting reflected in the sample, whereby one of the three programs has been found to be sensitive to the safety risk estimation issue, is a reasonable approximation of the broader significance of this issue across the remaining asset replacement programs.”⁶⁰

The AER assessed a non-representative sample of AusNet Services’ asset replacement programs. Of the sample of projects the AER considered, 66% of total expenditure was related to a program underpinned by the safety risk assumption the AER has disagreed with. Across AusNet Services’ entire asset replacement programs of work, only 14% of total expenditure is on programs that are assessed using this assumption. Therefore the AER’s sample is not representative, and its conclusion that adjustment to the remainder of the program based on its inclusion of a HZO Rate in the Safety Risk Assumption applied to justify other parts of AusNet Services’ capex forecast is unreasonable.

Secondary and Protection Program

The AER considered that it may be appropriate to use repex modelling as a first pass assessment of AusNet Services’ SCADA and network protection assets, given that these assets:

⁶⁰ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 54.

- Are replaced on a more consistent basis than most assets; and
- Are more suitable for modelling based on the historical data available.

The AER applied its repex model to two thirds (or \$101m) of AusNet Services' total forecast SCADA and network protection repex of \$145m. The repex model output was 5% below AusNet Services' proposed amount which the AER considered 'indicates that AusNet Services' proposed amount is consistent with its business as usual practices.'⁶¹ Despite this finding, and the AER's finding that AusNet Services' historical expenditure has been efficient in its ex post review of 2014-15 capex, the AER concluded that as its analysis was not consistent with its finding that AusNet Services systematically over-estimated safety risk (and project cost estimates) and applied a 8.2% reduction to forecast capex for this category.

As explained above, AusNet Services does not accept the AER's adjustment to safety risk cost. In addition, as shown in the Table above, the proposed secondary and protection program is not subject to the safety risk assumption that the AER has adjusted. Further, the AER's decision to place no weight on its repex modelling outcomes is inconsistent with its statements that it takes into account a variety of techniques when assessing forecast capex.

Therefore AusNet Services does not accept the adjustment the AER has made to its secondary and protection program.

The AER's Obligations under the National Electricity Rules

If the AER does not accept a TNSP's proposed capex, it must substitute it with an amount that reasonably reflects the capital expenditure criteria, taking into account the capital expenditure factors. The capital expenditure criteria include:

“comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services;

maintain the safety of the transmission system through the supply of prescribed transmission services.”⁶² (emphasis added).

These are two independent requirements.

Safety outcomes must be maintained

As a minimum, the AER must allow capital expenditure to enable a TNSP to **maintain the safety** of the transmission system. AusNet Services has applied the same approach to quantifying safety risk for the past 10 years. This is the existing standard that the AER has accepted in previous decisions.

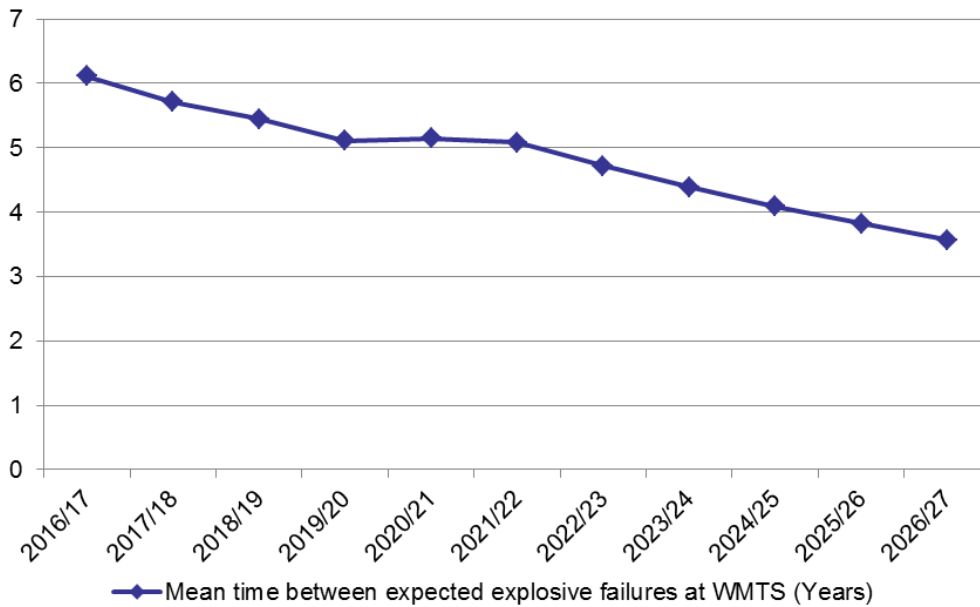
The approach adopted in the Draft Decision represents a significant change to the previously accepted approach, which has been embedded in AusNet Services' practices, to managing safety risk. While we acknowledge that the approach may need to evolve and improve, if AusNet Services were to adopt the Draft Decision, the safety of the transmission system would decline.

This can be demonstrated by considering the number of explosive failures that could be expected to occur under the Draft Decision approach, compared to AusNet Services' approach, across the major terminal station replacement projects. This is shown in the figure below, which presents the expected mean time between explosive failures at West Melbourne Terminal Station if replacement were not to go ahead.

⁶¹ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 58.

⁶² NER 6A.6.7(a) (2) and (4).

Figure 3.14: Mean Time between Explosive Failures (years)⁶³



This shows that, if the Draft Decision were implemented, explosive failures would be expected to become more frequent. In the case of West Melbourne, the expected frequency would increase to once every 3.6 years by 2026/27. This means that, if the proposed brownfield rebuild (which would take at least four years) were to proceed around this time, at least one explosive failure would be expected to occur. During a project where 50 workers a day are expected to be on site, public roadways and metropolitan train lines are within the hazard zone, this risk is unacceptable.

If applied and implemented consistently across the NEM, the Draft Decision approach would result in a decline in the safety standards and reliability of supply across transmission networks. This categorically increases the risk that an asset failure will cause harm to a transmission network employee or to the general public. This decline in safety standards and reliability and security of supply is inconsistent with the achievement of the NEO and is contrary to the NER, which preclude the AER from setting an allowance consistent with a decline in the safety of the network.

Even if the NER did permit a deterioration in safety outcomes via regulatory decisions, the question of whether the public is prepared to assume a higher level of risk from the operation of electricity assets in order to reduce the prices they pay for electricity, is a matter of public policy and therefore extensive consultation with the wider community, safety regulators and other TNSPs would be warranted before such a change is implemented. Given the time constraints, AusNet Services has been unable to carry out such consultation when preparing its Revised Revenue Proposal. However, initial high level discussions have been conducted with Energy Safe Victoria (ESV) on the impact to public safety. AusNet Services understands that ESV will provide a formal submission to the AER.

The level of funding permitted by the AER becomes a relevant factor in demonstrating the extent of any obligation imposed on AusNet Services in providing and maintaining safety standards. This became a key platform of the submissions in the recent Black Saturday bushfires litigation, in which the Court was asked to make an assessment of the extent of particular obligations owed by AusNet Services. The funding provided by the AER is a relevant determinant, and it is for this reason that the AER would also be implicated in any actual

⁶³ This has been derived by assuming that all 22 kV assets at WMTS will be retired by end 2021/22. All other assets will remain in service. The probability of an explosive failure will increase as the condition of the assets that pose an explosive failure risk deteriorates. These include circuit breakers, circuit breaker bushings, instrument transformers and transformer bushings.

incident of injury or death, if not directly, at least insofar as the AER contributed to the diminished standard of safety implied by its reduced funding allowance.

AusNet Services must comply with its Legislative Safety Obligations

The AER's Draft Decision does not change AusNet Services' legislative requirement to eliminate hazards to the extent practicable, as set out in the section above. Therefore, AusNet Services is required to continue to achieve safety performance in line with current levels.

While AusNet Services also employs a number of risk mitigation measures (see Section below) it is important to recognise that these measures are subservient to the requirement to eliminate the hazard where reasonably practicable in the context of the legislative obligations.

AusNet Services must comply with legislative obligations to protect the safety of its workforce and the general public (*Occupational Health and Safety Act 2004* (Vic)). If AusNet Services were to embed the AER's Draft Decision in its planning approach, this would expose its workforce to an unacceptable risk of injuries and fatalities.

While AusNet Services will continue to adhere to its various legislative and regulatory obligations when it comes to safety, consistent with the revenue and pricing principles, it is the reasonable expectation of AusNet Services that it would be appropriately funded to do so. Being exposed to reduced funding in this area is an unacceptable assumption of burden. The public expects AusNet Services to maintain the safety of its assets. If the public prefers not to pay for this, or to pay a reduced amount, a significant policy change is required. AusNet Services respectfully submits that this is a decision beyond the AER's functions and powers.

With the benefit of hindsight, any actual incident causing injury or a fatality would cause unacceptable reputational damage with the public, and potentially also liability, for AusNet Services and the AER.

Other Obligations

A key pillar of the NEO is the safety, reliability and security of electricity supply and the assets which provide it. While the failure of an asset may have safety implications, it almost always also affects security and reliability of supply. Therefore two limbs of the NEO are exposed if the AER's methodology is used to reduce expenditure on major projects as outlined above.

Moreover, as AEMO also has obligations and responsibilities in relation to the Victorian transmission network (unlike in other States), and AEMO has its own set of obligations under the NEL and NER in connection with these Victorian-specific arrangements, any failure in AusNet Services' transmission assets may also affect AEMO's ability to safely manage its obligations.

3.4.2.7 Concluding Comments

In summary, AusNet Services has presented a large body of evidence to justify a reconsideration of the Draft Decision conclusions on safety risk. As stated previously, further discussions on this important aspect of the Revised Revenue Proposal would be welcomed.

AusNet Services cannot accept the adjustment to costed safety risk the AER has applied in its Draft Decision. We consider that, taken as a package, AusNet Services' safety risk assessment approach is reasonable and to assume an increased level of safety risk would be imprudent, inconsistent with legislative obligations and would not provide lowest cost outcomes for consumers.

Box 3.5: Response to Stakeholder Feedback on its Safety Risk Valuation Approach

Stakeholders were interested in more detail on the approach AusNet Services adopted to quantify safety risk, and the AER's adjustment to this approach. This Revised Revenue Proposal sets out in detail AusNet Services' approach to quantifying safety risk and how this approach enables it to meet its obligations in relation to safety. It also details the adjustment that the AER has applied, and why AusNet Services does not agree with this.

3.4.3 Revised Revenue Proposal

AusNet Services does not accept the AER's adjustment to its approach to costing safety risk. This is because it:

- Does not take into account the safety of workers during the replacement projects proposed by AusNet Services;
- Is contrary to the safety obligations imposed on AusNet Services by legislation and regulations;
- Would undermine the achievement of the NEO and fail to adequately fund AusNet Services for achievement of the safety standards with which AusNet Services is required to comply;
- Is contrary to the requirements of the NER, including the requirement to maintain the safety of the transmission system, and security and reliability of supply;
- Does not account for safety of the general public. This is particularly relevant given the location of the major replacement projects proposed;
- May result in disproportionate additional expenditure in the event of an incident; and
- Would not enable brownfield replacement projects to proceed, increasing the costs of asset replacement projects.

AusNet Services maintains the approach set out in its Revenue Proposal to quantifying safety risk.

3.5 Choice of Demand Forecasts**3.5.1 Draft Decision**

The AER did not accept the demand forecasts applied by AusNet Services in its Revenue Proposal, for the following reasons:

- More recent demand forecasts had become available since AusNet Services prepared its Revenue Proposal, which AusNet Services has flagged it will consider;
- The Victorian DNSP forecasts applied by AusNet Services were not approved by the AER as the AER did not consider that they were realistic; and
- The desirability of enhancing consistency in planning across AusNet Services' major station replacement portfolio and between asset replacement planning and AEMO's network augmentation planning.

Instead, it considered that the latest AEMO demand forecasts should be exclusively relied upon by AusNet Services.

3.5.2 AusNet Services' Response

AusNet Services accepts the use of updated demand forecasts in planning capital replacements. This has been reflected in the Revised Revenue Proposal capex forecast.

Updated economic analysis of each major replacement project is submitted to support this Revised Revenue Proposal.

However, AusNet Services does not accept the automatic application of AEMO's demand forecasts across its entire replacement program. It considers that the Victorian DNSP's forecasts also provide relevant information and are, in some cases, superior to AEMO's. Therefore, it maintains its Revenue Proposal position that it is appropriate to consider the demand forecast on a case-by-case basis. Further information on its approach to considering demand forecasts is provided below.

Addressing the AER's Concerns

Consistency between replacement and augmentation planning

The AER's Draft Decision states that:

“...applying AEMO's demand forecasts would enhance consistency in planning both across AusNet Services' major station replacement portfolio, and between AusNet Services' asset replacement planning and AEMO's network augmentation planning.”⁶⁴

However, in Victoria, the Victorian DNSPs, not AEMO, are responsible for planning the augmentation of distribution to transmission connection assets. Because the major replacement projects included in AusNet Services' capex forecast for 2017-22 relate to transmission connection assets, to ensure consistency between replacement and augmentation planning for these assets the Victorian DNSPs', rather than AEMO's, forecasts should be applied.

AusNet Services agrees with the AER that consistency between replacement and augmentation planning is important, as it will 'ensure network assets are replaced or upgraded on a consistent basis across the transmission network.'⁶⁵ It will also enable savings or synergies to be realised by combining replacement and augmentation requirements. However, as explained above, because the Victorian DNSPs plan the connection assets AusNet Services is proposing to replace, to achieve the benefits of consistency it is the Victorian DNSPs' forecasts, rather than AEMO's forecasts, that should be applied.

This form of consistency is more likely to yield efficiencies than the benefits of applying consistent demand forecasts across the whole major station replacement portfolio. AusNet Services adopts a consistent approach to the economic assessment of projects when developing its work program. This ensures that its project prioritisation process is appropriate. Demand forecasts feed into this economic assessment process – to achieve the most efficient outcome it is most important that the forecasts are considered to be accurate and robust. As described below, AusNet Services applies a principles-based approach to selecting demand forecasts that ensure an accurate and robust forecast is applied. Consistency in the methodology applied to derive these forecasts is a second order consideration.

Need to consider the merits of the forecasting methodology

The Draft Decision states that:

“We consider that AEMO's terminal station demand forecasts reflect a realistic expectation of demand for AusNet Services' network because it is based on a consistent and well established forecasting methodology. This is consistent with the position we adopted in our final decision for the Victorian distributors 2016-20 regulatory determinations, including on demand forecasts.”⁶⁶

This is incorrect. The AER accepted the application of the Victorian DNSPs' (with the exception of United Energy's) demand forecasts in its Final Decision for the 2016-20 regulatory period.

⁶⁴ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 44.

⁶⁵ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 78.

⁶⁶ Ibid.

This illustrates that the AER considers these forecasts to be robust. In fact, the AER used exactly the same language in support of the DNSPs’ demand forecasts in the electricity distribution Final Decisions as it did for AEMO’s forecasts in the electricity transmission Draft Decision, being:

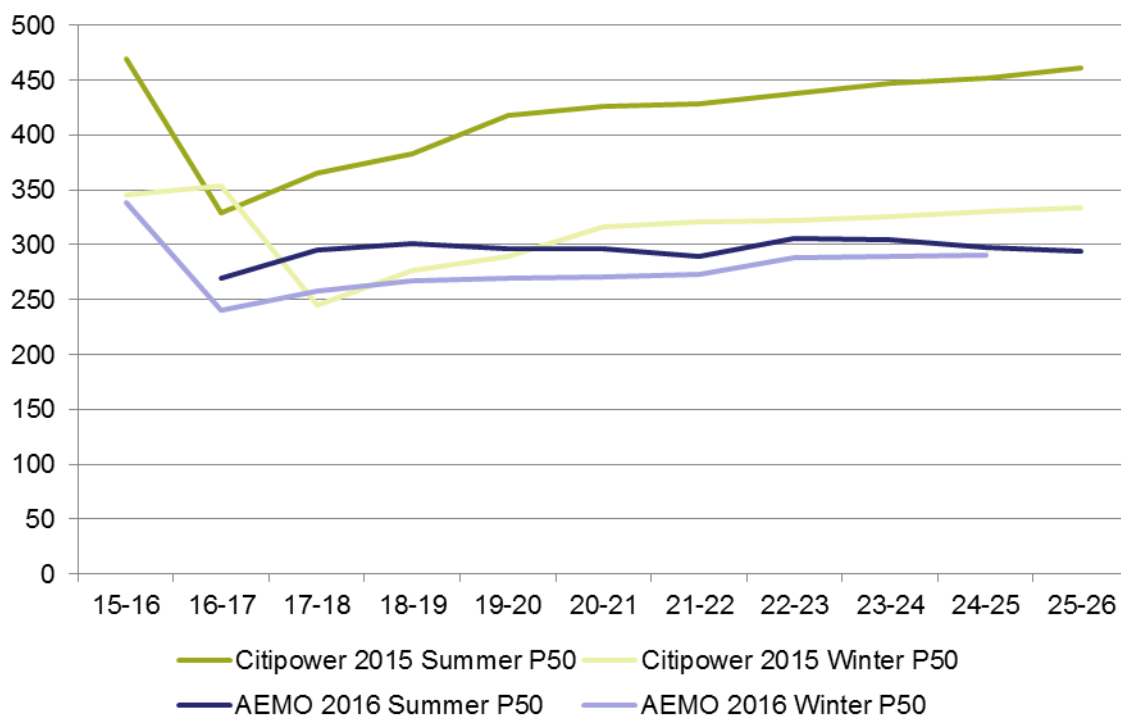
“We are satisfied that the maximum demand forecast for the 2016-20 period proposed by AusNet Services, in its revised proposal (January 2016), is a realistic expectation of demand.”⁶⁷

In addition, AusNet Services has some concerns with AEMO’s terminal station demand forecasting methodology. At West Melbourne, AEMO’s forecast do not include Citipower’s latest planned load transfers onto the 66kV network. This has been confirmed by AEMO, and its forecasting team is willing to discuss the matter with the AER should this be helpful.

Citipower’s forecasts do account for this. As Citipower’s plans to undertake load transfers due to its plans to decommission its 22kV network have been confirmed (and are the reason why AusNet Services is not replacing the 22kV assets at WMTS), AusNet Services considers that the Citipower WMTS demand forecast it has relied upon is superior to AEMO’s.

The two sets of demand forecasts for WMTS are shown below.

Figure 3.15: Comparison of AEMO’s and Citipower’s WMTS 66kV demand forecasts (MW)



While WMTS is a committed project, and, therefore the demand forecasts that underpinned its assessment have not been updated, if AusNet Services had adopted AEMO’s WMTS demand forecast, given the known shortfalls, there would be a material risk that it would not properly plan to enable Citipower’s load transfers to proceed. This would result in reliability risk for customers and thereby interfere with the attainment of the NEO. In this instance, the adoption of AEMO’s 2016 WMTS forecast would in fact violate one of the “best practice forecasting principles” that ACIL Allen Consulting noted in its 2013 report to AEMO on the development of a forecasting methodology. ACIL Allen noted:

⁶⁷ AER, Final Decision, AusNet Services distribution determination 2016 to 2020, Attachment 6 – Capital expenditure, May 2016, 6-101.

“From time to time network operators change the way their networks are configured. Some loads are shifted between existing zone substations or CPs [connection points] while others are shifted to new assets. These load transfers can be temporary (referred to herein as ‘switching’) or permanent nature (referred to as ‘transfers’).

To compare maximum demands over time, historical data must be adjusted to system normal conditions by removing or accounting for the impact of switching and transfers.

If this is not done, the data will suggest changes in demand at particular locations over time that did not actually occur. This would result in regression models with lower explanatory power and which are subject to biased coefficient estimates.”⁶⁸

This example highlights the problems with automatically applying a single set of forecasts. AusNet Services’ approach of applying a consistent set of principles when determining which forecast to adopt, rather than simply pre-determining a single source of forecasts, avoids this shortcoming. It also introduces more robustness by enabling us to draw upon and compare the performance of two sets of forecasts over time.

In addition, there are other shortfalls with AEMO’s current forecasting approach. AEMO’s connection point forecasts are reconciled to its statewide forecasts reported in its National Electricity Forecasting Report. The adjustment that is undertaken to perform this reconciliation reduces the granularity of the forecasts. Localised factors, which distribution businesses take into account when developing their own set of demand forecasts, may be lost or diluted in AEMO’s forecasts at specific connection points.

AusNet Services’ Principles-Based Approach to Assessing Demand Forecasts

As set out in its Revenue Proposal, AusNet Services considers both the most recent AEMO Transmission Connection Point Forecasts and the DNSP’s Victorian Terminal Station Demand Forecasts in planning asset replacements.

At transmission terminal stations, specific plans can have a material impact on forecast demand. Therefore it is appropriate to assess whether these have been fully taken into account when assessing a particular demand forecast. Sensitivity analysis is also undertaken to ensure that the economic timing of its replacement plans is robust under a range of forecast scenarios.

The principles AusNet Services considers when selecting demand forecasts at each transmission connection point are set out below.

- Is the forecast the most up-to-date forecast published by the Victorian DNSP or by AEMO, which incorporates the latest information on the drivers of demand?
- Have known DNSP or large load customer plans been adequately reflected in the forecast?
- Does the forecast appear realistic given the trend in weather-adjusted historical demand at the connection point?

If one of the forecasts is deficient against one of the principles then the other forecast is solely relied upon. However, where both the Victorian DNSP’s and AEMO’s forecast perform strongly against the above principles, then AusNet Services applies an average for that connection point.

Under this approach a forecast is only discarded if there are valid concerns about its accuracy. The approach is not biased towards selecting the highest, or lowest, forecast.

AEMO’s 2016 forecasts are close to its 2014 forecasts and are a significant step down on its 2015 forecasts. The main drivers of this reduction from 2015 are the assumptions regarding climate abatement policies, solar PV growth and the impact of energy efficiency in AEMO’s 2016 National Electricity Forecasting Report, which its 2016 connection point forecasts are

⁶⁸ ACIL Allen Consulting, *Connection Point Forecasting: a nationally consistent methodology for forecasting maximum electricity demand*, June 2013, p. 5.

reconciled to. The Victorian DNSPs' 2015 forecasts are generally lower than the 2014 forecasts that AusNet Services applied in its Revenue Proposal.

AusNet Services notes that the 2016 Victorian Terminal Station Demand Forecasts are due to be published with the Transmission Connection Planning Report (TCPR) in December 2016. We will assess the implications of these forecasts on the proposed works program and communicate these to the AER if sufficient time is available prior to the Final Decision.

The AER's Adjustment to AusNet Services' Forecast due to Reliability

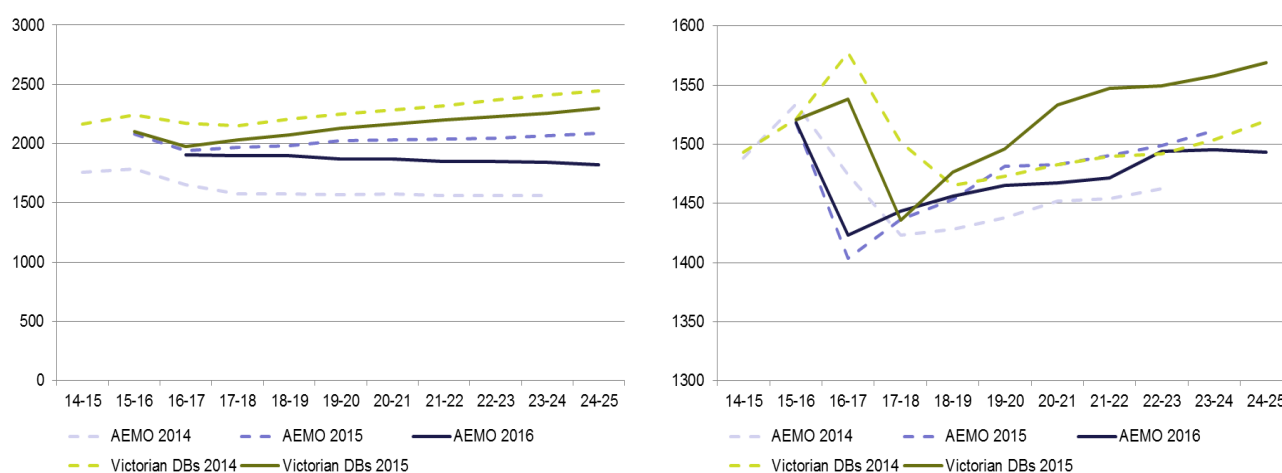
The AER's Draft Decision applies updated demand forecasts, being AEMO's 2015 transmission connection point demand forecasts, to quantify the expected reliability cost of asset failure across AusNet Services' major station projects. It has reduced AusNet Services' forecast capex as the demand forecasts it has applied are lower than the 2014 AEMO and Victorian DNSP forecasts applied in AusNet Services' Revenue Proposal.

On reviewing the AER's analysis, AusNet Services has identified that the AER has only updated the summer demand forecasts. However, AusNet Service's economic planning approach uses both summer and winter demand forecasts. Forecast winter demand can contribute to total expected unserved energy, which is an input into quantifying the economic risk of asset failure. The AER has not explained its reasons for only updating the summer demand forecasts in its Draft Decision.

We agree with the AER's strong preference for applying the latest demand forecasts. To achieve the capex objectives, the AER considers that the demand forecasts applied in determining the quantified economic risk of asset failure should reflect current expectations of demand.⁶⁹ However, the Draft Decision quantifies project benefits using 2015 summer demand forecasts and 2014 winter demand forecasts.

AusNet Services has updated both summer and winter demand forecasts to reflect the latest available data in its Revised Revenue Proposal. The Figure below compares the aggregate summer and the winter P10 demand forecasts for five proposed major replacement projects.⁷⁰

Figure 3.16: AEMO and Victorian DBs P10 demand forecasts (MW) – Summer and Winter



The Figures above show that both the summer and winter demand forecasts are updated by AEMO and the Victorian DBs each year. The 2014 winter demand forecasts no longer reflect the most up-to-date forecasts available. Under AusNet Services' principles-based approach to

⁶⁹ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 43.

⁷⁰ These projects are the Fisherman's Bend, Ringwood, Springvale, Templestowe and West Melbourne Terminal Station replacement projects.

assessing demand forecasts, the Victorian DBs 2015 forecasts (both summer and winter) and AEMO's 2016 forecasts (both summer and winter) should be applied.

3.5.3 Revised Revenue Proposal

AusNet Services has applied updated demand forecasts to its major stations replacement projects. As the application of its principles-based assessment approach has not uncovered any material concerns with either source of demand forecasts for these projects (noting West Melbourne Terminal Station is a committed project), a 50:50 average of the AEMO and Victorian DB's forecasts has been applied. Both summer and winter demand forecasts have been updated.

Updating the demand forecasts has not impacted the economic timing of the major replacement projects. Therefore, no adjustments have been made to forecast capex on this basis.

Note that, while West Melbourne Terminal Station is a committed project, Citipower's latest demand forecast confirms that the current project timing is justified.

3.6 Cost Estimation Bias Adjustment

3.6.1 Draft Decision

The AER reduced AusNet Services' project cost estimates by 4.6% to account for project cost overestimation bias. This was derived from a dataset of historical project cost estimates and outturns. The AER took the following approach in calculating its adjustment:

- Used AusNet Services' data set showing estimates and actual costs of 185 projects delivered between 2007 and 2015;
- Established the ratio of overestimates to underestimates is approximately 64:36.
- Calculated the average adjustment to estimated project costs that would set this ratio at 50:50. This was found to be 4.6%.

3.6.2 AusNet Services' Response

AusNet Services considers that the 0.89% top down adjustment proposed in AusNet Services' revenue proposal should be applied as the cost estimation bias adjustment. The AER's application of 4.6% is based on flawed mathematical logic and does not accurately capture expected cost estimation bias in the 2017-22 regulatory period.

The AER's Adjustment does not meet the Requirements of the NER

The AER states that:

"In our view, good estimating practice involves the periodic review of cost estimates against actual costs to correct forecast unit rates and scope definitions. Over time this process reduces and controls cost estimating error. Within a portfolio of works, where projects of similar types are repeated over time and where estimating error is controlled as described above, the variation at the overall portfolio level between forecast and actual costs will tend to zero. That is, if cost estimates are unbiased, then over time the ratio of observed project overestimation to underestimation should be around 50:50."⁷¹

The logic underlying this conclusion is problematic. AusNet Services agrees that, if good estimating practice were applied, the variation at the overall portfolio level between forecast and actual costs will tend to zero. Its proposed top-down adjustment of 0.89% is based on variation between forecast and actual costs at an aggregate, or portfolio, level.

⁷¹ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 38.

However, the AER concludes this implies that, if cost estimates are unbiased, the ratio of project overestimation to underestimation should be around 50:50. However, this assertion requires an additional assumption to be made: that the variations between forecast and actual costs are normally distributed. This is not the case; therefore, to apply this assumption would be an error of fact.

The historical project cost data provided by AusNet Services illustrates that, while 64% of the project costs were overestimated, and 36% of the project costs were underestimated, the average underestimate was \$504 and the average overestimate was \$355. That is, where project costs are underestimated, the underestimate is on average 42% greater than the average overestimate. The distribution of the variances is negatively skewed.

The AER seeks to calculate the adjustment required to forecast costs such that 50% of the cost estimates will be overestimates, and 50% of the cost estimates will be underestimates. However, this is the wrong question to ask. Instead, it should seek to find the required adjustment to forecast costs such that the capex forecast is a realistic expectation of the cost inputs required to achieve the capex objectives (NER 6A.6.7(c)(3)). Unless there is evidence to support the AER's view that variations between forecast and actual costs are normally distributed, the AER's adjustment cannot be said to meet the requirements of the NER.

The AER's Critique of AusNet Services' Approach is Mathematically Erroneous

In its Revenue Proposal AusNet Services applied a top-down adjustment to its capex forecast of 0.89%. While AusNet Services' Revenue Proposal refers to this as a 'portfolio efficiency adjustment', it is derived by comparing project cost estimate to outturns, as is the AER's cost estimation bias adjustment.

AusNet Services' proposed adjustment represents the observed average estimating error derived from the same dataset of 185 historical project estimates and outturns as applied by the AER in its analysis described above. The AER correctly states that AusNet Services' method of calculation is as follows:

$$\frac{\text{Cumulative estimating error}}{\text{Total estimated cost}}$$

The AER has rejected the application of this on the basis that AusNet Services has not provided evidence to justify why this provides a valid estimate of portfolio efficiencies it might achieve in the 2017-22 regulatory control period.

It has also expressed misplaced concerns that the methodology applied by AusNet Services will inevitably trend toward zero as a greater number of projects are added to the sample. The AER states that:

"In AusNet Services' calculation, the cumulative estimating error (numerator) is the sum of positive and negative project estimating residuals (project cost over runs and under runs) for the portfolio of historical projects. As the number of projects increases, the numerator is expected to remain small and fluctuate around zero as positive and negative residuals are added to the sample. However, as the number of projects increases the total portfolio cost (denominator) grows ever larger as comparatively large positive project costs are added. Consequently, over time this calculation will converge towards small percentages around zero which are a function of the choice of sample size."⁷²

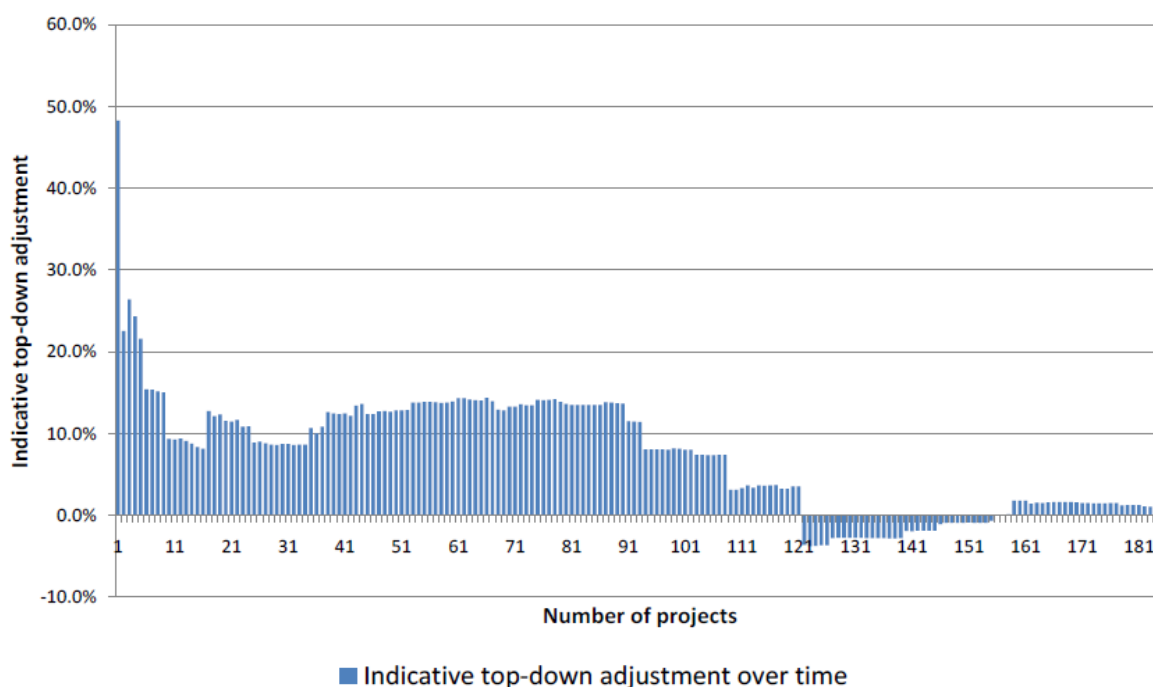
This assertion is mathematically flawed. The calculation only converges to zero over time where positive and negative residuals, of a similar total magnitude, are added to the sample. The presence of both positive and negative residuals of a similar total magnitude indicates that no strong cost estimation bias is present, so it is to be expected that the result would be close to zero.

⁷² AER, Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22, July 2016: Attachment 6, p. 40.

Were a strong positive bias present in AusNet Services' cost estimates, only positive residuals would be added to the sample, the result would be strongly positive, and vice versa. This is not related to the total portfolio costs growing ever larger – if project costs are consistently overestimated, a positive percentage will result, and if the costs of the same sample are relatively accurately estimated (the under and overestimates roughly balance out), then an average of close to zero will be observed.

The AER considers that its concern is illustrated by its Figure 6.6, which is reproduced below:

Figure 3.17: Top-down Efficiency Adjustment Over Time (Figure 6.6 from Draft Decision)



The AER considers that this illustrates that AusNet Services' approach is flawed, and also states that for certain sample sizes, the adjustment would become negative and illustrates there are 'portfolio inefficiencies'. In this context, the realisation of 'portfolio inefficiencies' described by the AER reflects that AusNet Services' cost estimates were, based on a specific sample size, on average, understating the costs required to deliver the work. Over and underestimates are to be expected given AusNet Services produces P50 estimates to its capex forecast. Indeed, if these cost estimates have a high degree of accuracy on average, it is to be expected that some samples will show underestimates and some will show overestimates.

If this were observed to be an inherent bias towards the underestimation of costs in AusNet Services' cost estimation practices, then an increase to its project cost estimates would be required to accurately reflect project costs. However, AusNet Services does not contend that this is the case.

The fact that the AER's analysis shows that AusNet Services' top-down efficiency adjustment reduces in value over time is not evidence that its methodology is inappropriate, but is in fact evidence that its cost estimation practices are becoming more accurate over time. That is, the differences between project cost estimates and project cost outturns are reducing in magnitude as more projects are completed. This is consistent with the expectations of the AER that continuous improvements made to refine cost estimation practices, including adjustments to unit rates and scope definitions, will reduce forecasting error over time.

Given the maturity of AusNet Services' cost estimation practices today, data that is 5-10 years old will not be as relevant to assessing the expected cost estimation bias over the 2017-22

regulatory period. This is consistent with the AER's statement that over time, good cost estimating practice involves making revisions to the process that will reduce forecasting error.

If most recent 6 years of data is used (projects completed between 2010 and 2015), the average cost estimation bias becomes zero. While AusNet Services considers that this adjustment may be more accurate than its original proposal, it has retained the 0.89% adjustment which was included its Revenue Proposal.

3.6.3 Revised Revenue Proposal

AusNet Services' Revised Revenue Proposal upholds the 0.89% top down adjustment. If the AER considers that the use of more recent data is appropriate, it should not apply any cost estimation bias adjustment.

3.7 Additional Expenditure Requirements

AusNet Services submitted its Revenue Proposal in October 2015. In March 2016 there was a failure of a 150MVA 220/66kV transformer at Ringwood Terminal Station.

C-I-C
C-I-C

There are several of these transformers on the network, all of which are approaching 50 years of age. We have reassessed the condition of these transformers C-I-C . Generally, these transformers are located at points with multiple transformers of a different make and condition. Therefore, we intend to manage the additional risk within the existing capex forecast.

However, because three of these transformers are located at a single terminal station (East Rowville) that has just four transformers in total, economic analysis indicates that, due to the downgraded condition and likelihood that multiple coincident failures are materially possible, the supply risk at this site justifies the replacement of these three transformers within the next regulatory period. The fault level at East Rowville Terminal Station is also high, which increases the likelihood of such a failure. Previously, this replacement project was planned to be undertaken in the 2022-2027 regulatory control period.

Additional capital expenditure of \$21.5 million (\$2016-17, direct) has been added to our Revised Revenue Proposal to fund the East Rowville Terminal Station replacement project. Because the condition of the remaining six transformers of the same type has also been downgraded, the replacement of these will also be required shortly.

It is unfortunate that this additional expenditure requirement was unknown when AusNet Services submitted its Revenue Proposal. It has only arisen due to the implications of an unforeseeable fault event which occurred between submission of the Revenue Proposal and the AER's Draft Decision. To maximise the ability of stakeholders and the AER to assess this additional expenditure requirement, we have taken the opportunity to discuss this additional replacement project with stakeholders and the AER, including at the 16 August Public Forum held on AusNet Services' Revised Revenue Proposal positions.

Further project details are provided below.

3.7.1 East Rowville Terminal Station Replacement Project

East Rowville Terminal Station (ERTS) is located south-east of Melbourne's CBD and is the main source of supply for much of the outer south-eastern corridor of Melbourne. The geographic coverage of the area supplied by this station spans from Scoresby in the north to Lyndhurst in the south, and from Belgrave in the east to Mulgrave in the west. The electricity supply network for this large region is split between United Energy (UE) and AusNet Electricity Services.

This project will replace the B1, B3 and B4 220/66 kV transformers, two 220 kV circuit breakers and three 66 kV circuit breakers. The economic timing of this project has been re-assessed since the last review and its forecast completion date is the end of 2019.

Attached are the following documents which provide further details on the East Rowville replacement project:

- Appendix 3G – East Rowville Terminal Station Planning report; and
- Technical supporting document – Transformer condition assessment report.

3.8 Non-network

3.8.1 Draft Decision

The AER approved a direct non-network capex forecast of \$99.4 million (real 2016-17), a reduction of 6% on AusNet Services' forecast of \$105.8 million.

The AER accepted AusNet Services' forecast capex for buildings and property, vehicles and other non-network capex, but did not accept the forecast of IT capex. The AER also made a revenue adjustment to account for forecast fleet disposals.

While the AER accepted capex associated with corporate-wide IT projects,⁷³ it did not accept the forecast of transmission-specific IT capex. The AER rejected capex of \$4.6 million relating to two transmission-specific IT projects on the basis that AusNet Services did not provide project justifications for these projects. The AER stated:

"We also reviewed the transmission specific ICT capex projects which total \$17.3 million. Where AusNet Services provided sufficient justification for the expenditure, we accept that proposed forecast capex. AusNet Services' response to our information request provided further information regarding the transmissions specific projects, including the split between recurrent and non-recurrent expenditure and some project justifications. This information provided sufficient justification for most of AusNet Services' forecast ICT capex.

*However, we substituted an amount of \$11.7 million, on the basis that AusNet Services did not provide further information for a number of transmission specific projects that are non-recurrent expenditure. The specific projects are discussed in confidential appendix F. The projects are mentioned briefly in the ICT Strategy and in the spreadsheet providing the project breakdown, but no project justifications or business cases have been provided. In the absence of any project justifications, it is not clear why these projects are required to achieve the capital expenditure objectives."*⁷⁴

The AER also stated:

*"If AusNet Services provides further information on these projects in its revised proposal, we will consider that information and assess whether the expenditure is necessary to achieve the capital expenditure objectives in the NER."*⁷⁵

The remaining \$1.9 million of the reduction applied by the AER was due to a CPI adjustment.

3.8.2 AusNet Services' Response

AusNet Services' accepts the AER's Draft Decision in relation to buildings and property, vehicles and 'other' non-network capex, and the revenue adjustment it has made for fleet disposals.

⁷³ These projects relate to systems shared across AusNet Services' electricity transmission, electricity distribution and gas distribution businesses.

⁷⁴ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 71.

⁷⁵ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 72.

AusNet Services does not accept the Draft Decision on non-network capex and maintains the forecast included in its Revenue Proposal.

As noted in the Draft Decision, when the AER requested further information on the IT capex forecast, AusNet Services provided project justifications for ‘a range of forecast projects which provide key details pertaining to the planned portfolio of work’.⁷⁶ This information did not include project justifications for the two projects rejected by the AER. In providing this information, AusNet Services intended to demonstrate the type of analysis supporting the projects included in its IT capex forecast and did not provide supporting documentation for every project.

AusNet Services considers the two projects rejected by the AER are required to achieve the capex objectives and, therefore, now provides project justifications for these projects as a supporting document to this proposal (Appendix 3J). AusNet Services would welcome the opportunity to discuss these projects with the AER should it require further information.

3.9 Capitalised Overheads

3.9.1 Draft Decision

The AER did not accept AusNet Services’ proposed capitalised overheads of \$56.5m (\$2016-17). Instead, it:

- Assumed 75% of capitalised overheads are fixed and 25% of capitalised overheads are variable; and
- Reduced variable capitalised overheads in line with the reductions made to AusNet Services’ capex forecast, to account for a lower volume of work proceeding.

The AER’s approach resulted in a 7.2% reduction to capitalised overheads.

3.9.2 AusNet Services’ Response

AusNet Services has applied the AER’s approach to forecasting capitalised overheads, but has updated this to reflect the Revised Revenue Proposal’s capital expenditure forecast.

It is also expected that given the AER’s preferred approach to setting the allowance for capitalised overheads includes a variable component, the AER will include an allowance for capitalised overheads (determined on a consistent basis) in any subsequent allowances for pass through events that occur during the 2017-22 regulatory period.

3.10 Other Matters

Request for Further Information to Substantiate Asset Failure Rates

The Draft Decision states that:

“We expect that AusNet Services is well placed to provide information to substantiate that its asset failure rates reasonably correspond with failure modes and the related consequences. We also expect that the calibration of the asset failure rates can be shown to result in a reasonably unbiased estimator of the asset’s historical failure rates and that AusNet Services’ mapping of equipment to its discrete condition index scale does not create a bias in the resulting failure rate estimates. AusNet Services should provide information to substantiate these aspects of its asset failure rates in its revised proposal.”⁷⁷

AusNet Services has provided the AER with substantial information to support its asset failures rates, including in technical supporting documents to its Revenue Proposal, in response to Q&A, information on the theoretical basis underpinning its asset failure rates and historical

⁷⁶ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 71.

⁷⁷ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 62.

asset failure rate data. AusNet Services does not have any additional information available to provide to the AER.

Residual Life RIN Data

The AER has observed a dip in estimated residual asset lives provided in the RIN data in 2013-14. It does not consider this to be plausible and states that it expects 'AusNet Services to clarify this observation in its revised proposal'.⁷⁸

The change in the RIN data reporting residual asset lives between 2012-13 and 2013-14 is due to the use of updated data, rather than a fundamental change in the condition of the assets. Further detail on the data amendments by asset category was provided to the AER on 12 June 2016 in response to a question on the change in the residual asset lives reported in the 2013-14 RIN.

Capex for 2015-16 and 2016-17

The Revised Revenue Proposal includes updated 2015-16 capex (as incurred and as commissioned) to reflect actuals, as reported in the 2015-16 Regulatory Accounts.

Forecast as incurred and as commissioned capex for 2016-17 is consistent with that provided in the Revenue Proposal. Minor adjustments to 2016-17 as commissioned capex have been made as a result of:

- Updated CPI escalation factor to convert values in real \$2015-16 to \$March 2017; and
- Minor true-ups to commissioning profiles for major replacement projects due to differences between the 2015-16 forecast and actual commissioned capex.

3.11 Stakeholder Feedback

Stakeholder views have been incorporated into the capex forecast in the following ways:

- Through the use of the VCR in the replacement planning approach. Given the VCR directly reflects the value consumers place on reliability, which then determines the economic timing of each proposed capex project, this is the most robust way in which stakeholder feedback has been incorporated into the initial and revised revenue proposals.
- Incorporating stakeholder feedback received in written submissions to the AER and further engagement AusNet Services has undertaken it submitted its Revenue Proposal.

Feedback received since submission of the Revenue Proposal, and AusNet Services' response to this feedback, is presented in the Table below. Feedback related to specific components of the capex forecast is addressed in the relevant sections of this chapter. This is contained in the boxes shaded in yellow.

Table 3.9: Stakeholder Feedback on Capital Expenditure

Stakeholder Feedback	Response
Why is AusNet Services asking for so much additional expenditure to address safety risk?	AusNet Services' Revenue Proposal did not include significant additional expenditure driven by the need to address safety risk. Instead, AusNet Services' BAU replacement program is justified based on a range of drivers, including reliability, safety and environmental benefits. It is the safety benefits that have underpinned AusNet Services' BAU asset replacement program that have been discounted by the AER, resulting in a reduction to

⁷⁸ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 6, p. 65.

Stakeholder Feedback	Response
	AusNet Services' BAU asset replacement program.
Has the cause of the incident at Richmond Terminal Station been identified?	Yes. The main cause was the presence of water in the top cap of the current transformer due to degraded sealing. The current transformer was due to be replaced within the next 6 months.
Will AusNet Services apply a different approach to quantifying safety risk in its Revised Revenue Proposal?	No. AusNet Services has maintained the approach included in its Revenue Proposal. As explained in this chapter, its approach is reasonable when it is considered as an overall package. This has been affirmed by GHD.
Has the AER's approach to adjusting AusNet Services' quantified safety risk been applied across all TNSPs?	No. This is the first time that the AER has made an adjustment of this nature to a TNSP's proposed replacement program. Previously, the AER has adjusted specific programs as it considered that safety benefits were overestimated (for example, TransGrid's line span remediation program). However, it has not previously applied such a large discount to safety benefits across a TNSP's entire asset replacement program.
If the new information about the condition of the three East Rowville transformers had come to light during the next regulatory period, how would AusNet Services have managed the risk?	If the information had come to light within the 2017-22 regulatory period, AusNet Services would have needed to reprioritise its capex allowance to manage the risk. However, it is likely that other, unforeseen issues, may arise within the next regulatory period which will require reprioritisation to occur. It is important that the capex allowance reflects all material expenditure drivers that are known at the time the regulatory review is carried out.

3.12 Total Capex Forecast

AusNet Services' Revised Revenue Proposal capital expenditure forecast is shown in the Table below.

Table 3.10: Revised Revenue Proposal Capex Forecast (\$m, real 2016-17)

Category	2017-18	2018-19	2019-20	2020-21	2021-22	Total
CBD station rebuilds	35.5	25.7	29.3	18.0	8.1	116.5
Major stations replacement	52.4	39.2	41.7	42.0	34.7	210.0
Asset replacement programs	48.5	55.1	50.0	47.9	43.7	245.2
Safety, security and compliance	14.3	13.7	14.5	13.0	14.5	70.1
Non-network	30.3	27.9	19.1	16.5	15.6	109.5
Total	181.0	161.6	154.7	137.3	116.7	751.3

3.13 Supporting Documents

The following Appendices are provided to support this Chapter:

- Appendix 3A – GHD, *Risk Engineering Expert Advice – Safety Risk Quantification Report*, September 2016 (Confidential)
- Appendix 3B – Statement from the Board of AusNet Services
- Appendix 3C – AER's HZO Rate Model
- Appendix 3D – Assessment of alternative project options
- Appendix 3E – Hazard Zones (Confidential)
- Appendix 3F – Farrier Swier Consulting, Independent Advice on Capex Economic Analysis Approach
- Appendix 3G – East Rowville Terminal Station Planning report
- Appendix 3H – Selected ICT Project Justifications

The following technical supporting documents are also provided to support this chapter:

- Updated economic assessments of the major replacement projects using updated demand forecasts
- Transformer condition assessment report
- Updated Instrument Transformer Works Program NPV
- Actual, Estimated and Forecast Expenditure contains a breakdown of capital expenditure for the current and forecast regulatory control period

4 Operating and Maintenance Expenditure

This chapter sets out AusNet Services' response to the Australian Energy Regulator's (AER's) Draft Decision with respect to operating and maintenance expenditure (opex) as set out in Attachment 7 of the Draft Decision. AusNet Services' initial operating expenditure positions were set out in Chapter 5 of the Revenue Proposal.

In the event of inconsistency between information contained in this chapter and AusNet Services' earlier Revenue Proposal, the information contained in this chapter prevails.

4.1 Key Points

- AusNet Services is forecasting a total opex requirement of \$1,057.6 million (real 2016-17) over the forthcoming regulatory control period, of which the uncontrollable easement land tax accounts for more than half.
- The Revised Revenue Proposal controllable opex forecast represents a material (6%) reduction on the Revenue Proposal's forecast.
- AusNet Services accepts a number of aspects of the Draft Decision, including:
 - Base year opex, with the exception of adjustments for self-insurance;
 - The output growth component of the rate of change;
 - The forecast of opex attributable to the roll in of Group 3 assets, subject to an adjustment to reflect the Revised Revenue Proposal's base year;
 - The forecast of insurance costs; and
 - The forecast of debt raising costs.
- AusNet Services does not accept the Draft Decision on:
 - Step changes, except for the new emergency response arrangements step change;
 - The approach to forecasting self-insurance costs; and
 - The real price change and productivity change components of the rate of change.

4.2 Summary

4.2.1 Draft Decision

The AER's Draft Decision approved \$1,031.9 million of opex (real 2016-17, including debt raising costs) for the 2017-22 regulatory control period, a reduction of 6.3% on AusNet Services' forecast opex of \$1,101.7 million. The key drivers of the \$69.8 million reduction were:

- The AER's rejection of AusNet Services' output growth forecast of \$33.7 million;⁷⁹
- The AER's rejection of AusNet Services' proposed step changes of \$13.5 million;
- The AER's forecast of insurance and self-insurance using base year costs (resulting in a \$14.4 million cut); and
- The AER's forecast of debt raising costs using its benchmark approach (resulting in a \$9 million cut).

⁷⁹ Using the base year approach applied in the Revenue Proposal.

4.2.2 Revised Revenue Proposal

The Revised Revenue Proposal accepts some aspects of the Draft Decision, including where the AER has applied a different forecasting approach. However, AusNet Services does not accept the Draft Decision on step changes, except for the new emergency response arrangements step change.

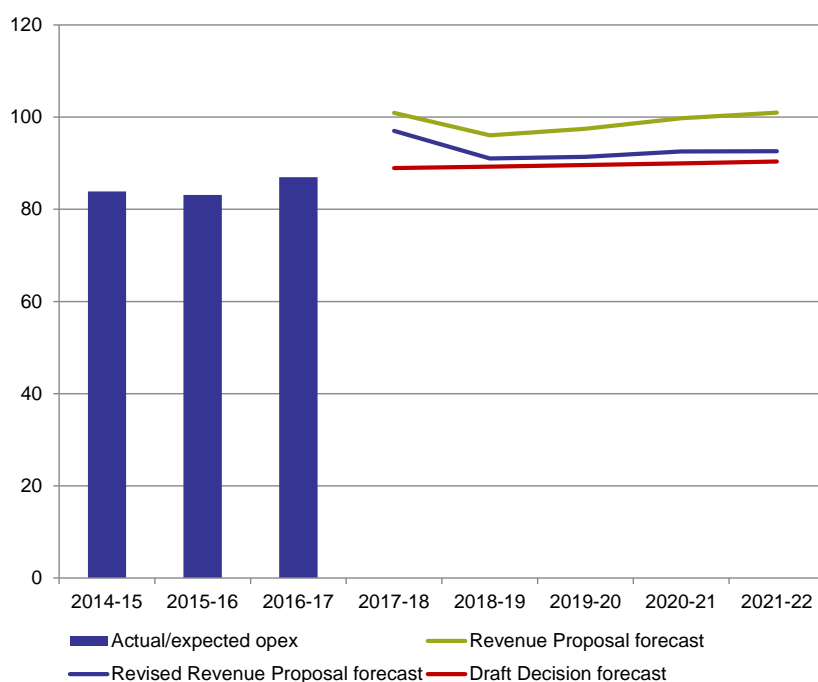
In summary, AusNet Services:

- Accepts the base year opex decision, with the exception of adjustments for self-insurance;
- Accepts the methodology for determining the rate of change, but does not accept the AER's real price change or productivity change inputs;
- Accepts the forecast of opex attributable to the roll in of Group 3 assets, subject to an adjustment for the Revised Revenue Proposal's base year;
- Adopts the approach to forecasting insurance costs;
- Adopts the approach to forecasting debt raising costs;
- Does not accept the approach to forecasting self-insurance costs, in respect of which it appears the AER has made an error by basing its analysis on losses, rather than on premiums; and
- Does not accept the decision on step changes.

On the basis of these varied elements, AusNet Services forecasts opex of \$1,057.6 million for the forthcoming regulatory period. This is 4% less than the Revenue Proposal.

The Figure below compares AusNet Services' Revised Revenue Proposal controllable opex forecast with actual/expected opex, the Revenue Proposal forecast and the Draft Decision forecast. The Revised Revenue Proposal represents a relatively modest increase on actual/expected opex in the current period and a material reduction on the Revenue Proposal's forecast.

Figure 4.1: Revised Revenue proposal controllable opex forecast (\$m, real 2016-17)



Source: AusNet Services

Note: Excludes easement land tax, self-insurance, debt raising costs and movements in provisions

The remainder of this chapter is structured as follows:

- Section 4.3 sets out the proposed base year expenditure;
- Section 4.4 details the proposed rate of change;
- Section 4.5 discusses forecast opex from the roll in of Group 3 assets;
- Section 4.6 sets out the step changes proposed for the forthcoming period;
- Section 4.7 discusses self-insurance;
- Section 4.8 addresses the easement land tax forecast;
- Section 4.9 provides the total opex forecast for the forthcoming period; and
- Section 4.10 lists the supporting documents that are relevant to this Chapter.

The information set out in this chapter accords with all the applicable requirements of the National Electricity Rules (NER).

4.3 Base Year

AusNet Services accepts the Draft Decision base year opex with the exception of the AER's inclusion of self-insurance losses in the base year.

4.3.1 Draft Decision

The Draft Decision accepted AusNet Services' actual reported 2014-15 expenditure as the base year for the opex forecast for the forthcoming period. In making this decision, the AER considered that "benchmarking indicates AusNet Services is operating relatively efficiently when compared to other service providers in the NEM so we consider this is a reasonable starting point for determining our opex forecast."⁸⁰

The AER accepted the following adjustments to actual 2014-15 opex made by AusNet Services:

- Removed the movement in provisions reported as opex in 2014-15;
- Removed NCIPAP opex incurred in 2014-15;
- Removed the AIS rebate paid in 2014-15; and
- Removed easement land tax paid in 2014-15.

The AER also made the following additional adjustments:

- Removed debt raising costs, which AusNet Services included in its proposed base year;
- Included self-insurance and insurance costs, which AusNet Services forecast on a category-specific basis;
- Converted base year opex to 2016-17 dollars using March Quarter CPI on an unlagged basis, rather than the September Quarter, one-year lagged basis used by AusNet Services; and
- Estimated final year (2016-17) opex using the equation set out in its Guideline, whereas AusNet Services applied the rate of change to 2014-15 opex.

⁸⁰ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 22.

4.3.2 Response to Draft Decision

AusNet Services accepts the AER's calculation of its base year opex, with the exception of the AER's inclusion of self-insurance losses.

While AusNet Services accepts the forecasts of insurance and debt raising costs, concerns around the forecasting approach applied by the AER in these cost categories remain and are explained below.

The choice of base year is discussed below, while self-insurance is discussed in section 4.7.

Box 4.1: Response to stakeholder feedback on benchmarking

Stakeholders asked whether the AER had undertaken benchmarking of transmission networks and whether this had been relied on in the Draft Decision.

As described in section 5.6.4 of the Revenue Proposal, the AER undertakes both high level and category-specific benchmarking for transmission networks. AusNet Services performs strongly in this benchmarking analysis compared to its peers, particularly when examining productivity trends over time.

The AER is required to consider its benchmarking analysis when assessing networks' opex forecast. The AER typically uses benchmarking to determine whether a service providers base year costs are efficient and, therefore, suitable for a revealed cost forecasting approach

The Draft Decision confirmed the efficiency of AusNet Services' 2014-15 base year, with the AER stating:

*"Benchmarking indicates AusNet Services is operating relatively efficiently when compared to other service providers in the NEM so we consider this is a reasonable starting point for determining our opex forecast."*⁸¹

Insurance

The AER rejected AusNet Services' category-specific forecast of insurance costs in the base year and substituted a forecast based on the total insurance costs incurred in a single year.

AusNet Services adopts the Draft Decision's forecast of insurance on the grounds that it is not materially different to AusNet Services' latest insurance forecast. However, AusNet Services considers that, depending on the specific drivers and materiality of specific cost categories such as insurance, an expert actuarial forecast is a preferable approach to determine a total opex forecast that meets the opex criteria.

Debt raising costs

The AER rejected the inclusion of actual debt raising costs in the base year and instead forecast these costs using its benchmark approach because it considered:⁸²

- The AER's approach is supported by updated advice from ACG and Incenta and is adopted by most service providers;
- AusNet Services' debt raising costs:
 - Are around 2.5 times the benchmark allowance and are therefore either inefficient or do not capture the same scope of costs as the benchmark; and
 - Lacked transparency and were not able to be verified.

⁸¹ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7, p. 22.

⁸² AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 3 – Rate of return, p. 341.

AusNet Services disagrees with the above view and notes the following:

- The use of a benchmark approach is inconsistent with the AER's preferred revealed cost approach to forecasting opex;
- The purpose of the Incenta analysis referred to by the AER is to assess the quantum of basis points required for the relevant NSP and is not evidence that the benchmark approach is preferable to a revealed cost approach;
- AusNet Services faces a very strong incentive to minimise its debt raising costs to an efficient level; and
- AusNet Services' actual debt raising costs – which AusNet Services is able to verify – were not questioned during the review process.

Nonetheless, AusNet Services has adopted the AER's forecast of debt raising costs, reducing its opex forecast by approximately \$9 million. However, the forecasting approach should be the subject of re-evaluation at the next relevant Guideline review (Expenditure Forecast Assessment Guideline or Rate of Return Guideline) to ensure an open and informed debate about this matter, and to assist the AER and other NSPs to consider whether this approach is consistent with, and best achieves, the NEO. In particular, it is important that the approach to forecasting *debt raising costs* not continue to be led by consideration of the *cost of debt* as it has been to date. These costs are very different in nature.

Box 4.2: Response to stakeholder feedback on debt raising costs

Stakeholders asked whether debt raising costs are accounted for in the rate of return or the opex forecast.

Debt raising costs are the transaction costs associated with raising or refinancing debt, and principally comprise legal and banking fees. The AER has stated that “debt raising costs are an unavoidable cost of raising debt that would be incurred by a prudent service provider.”⁸³

The rate of return reflects the efficient financing costs of the benchmark efficient entity, including the cost of debt.

Accordingly, while both debt raising costs and the rate of return relate to a service provider's efficient financing costs, the nature of debt raising costs means that they are most appropriately recovered through the opex forecast, rather than the rate of return.

Choice of base year

AusNet Services' Revenue Proposal used 2014-15 as the base year because it was the most recently available full year of audited opex data, and was considered representative of an efficient level of operating costs over the forthcoming period.⁸⁴ The AER has accepted this base year and concluded that using 2014–15 as the base year would produce an opex forecast consistent with the opex criteria.⁸⁵

While the Revenue Proposal flagged that the choice of base year would be reviewed following the completion of the 2015-16 regulatory year, a review of 2015-16 opex confirms that 2014-15 remains a suitable base year to forecast opex for the forthcoming period.

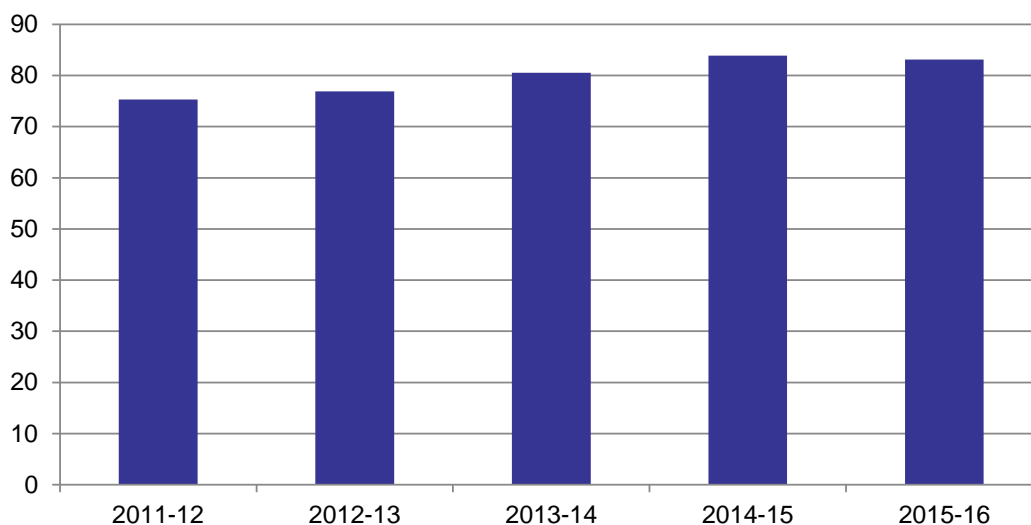
The Figure below shows opex from 2011-12 to 2015-16, excluding the cost items that are removed from total opex when determining base year opex.

⁸³ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 3, p. 339.

⁸⁴ AusNet Services, *Revenue Proposal*, pp. 117-118.

⁸⁵ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 30.

Figure 4.2: Actual opex (\$m, real 2016-17)



Source: AusNet Services

Note: Excludes NCIPAP opex, AIS rebates, easement land tax, self-insurance and movements in provisions.

Between 2011-12 and 2014-15, opex followed a slightly increasing trend, before steadying in 2014-15, with 2015-16 opex just 0.9% lower than 2014-15 opex.

While a 2014-15 base year slightly increases the opex forecast compared to a forecast based on 2015-16 opex, the operation of the EBSS makes a TNSP indifferent to the choice of base year. This is because any change to the opex forecast from selecting a different base year is offset by an equal and opposite change to the EBSS carryover amount. AusNet Services therefore accepts the Draft Decision to set 2014-15 as the base year for forecasting opex for the forthcoming period.

4.3.3 Revised Revenue Proposal

AusNet Services' Revised Revenue Proposal features base year opex of \$83.9 million, which translates to a final year (2016-17) opex estimate of \$87 million. Base year opex accounts for 41.4% of the total opex forecast because it excludes easement land tax, which is a significant and uncontrollable operating cost. The Table below shows how base year and final year opex are derived from total 2014-15 opex.

Table 4.1: Base year opex (\$m, real 2016-17)

	2014-15
Total opex (excl. debt raising costs)	196.0
Less: NCIPAP opex	-0.3
Less: AIS rebate	-2.5
Less: easement land tax	-107.6
Less: self-insurance	-1.8
Less: movements in provisions	0.1
Base year opex	83.9
Final year increment	3.1
Final year opex	87.0

Source: AusNet Services

4.4 Rate of Change

AusNet Services does not accept the rate of change applied in the Draft Decision because it does not provide AusNet Services with a reasonable opportunity to recover at least the efficient costs of a prudent TNSP.

The Draft Decision understates the real price change increases AusNet Services expects to incur during the next regulatory period because it forecasts labour costs using labour and non-labour weights based on an outdated 'benchmark weighting', which:

- Differs markedly from the composition of AusNet Services' actual opex; and
- Is inconsistent with the established principle of using actual, revealed costs to forecast opex.

Given this, the AER's approach is inconsistent with the principle that a regulated network service provider should be provided with both a reasonable opportunity to recover at least the efficient costs the operator incurs in providing network services; and effective incentives in order to promote economically efficient investment in, and efficient use of, the transmission network, as provided by the revenue and pricing principles of the National Electricity Law (NEL). Accordingly, AusNet Services does not accept the real price change component of the Draft Decision rate of change.

The Draft Decision also applies a productivity forecast that does not reflect a realistic expectation of productivity improvements over the forthcoming period. Therefore, AusNet Services does not accept the productivity change component of the Draft Decision rate of change.

AusNet Services accepts the output growth component of the rate of change applied in the Draft Decision.

4.4.1 Draft Decision

The Draft Decision accepted AusNet Services' approach to forecasting opex growth which was based on the rate of change model applied by the AER in its recent regulatory decisions. This approach accounts for:

- Real price growth;
- Output growth; and
- Productivity change.

While the AER accepted AusNet Services' approach, it did not accept all of the inputs used to generate it.

Real price growth

AusNet Services proposed the following labour escalators for the forthcoming period:

- **Internal labour.** An average of forecasts of the Electricity, Gas, Water and Waste Services (EGWWS) Wage Price Index (WPI) developed by the Centre for International Economics (CIE) and Deloitte Access Economics (DAE); and
- **External labour.** An average of forecasts of the Construction Industry WPI developed by CIE and DAE.

The Draft Decision rejected AusNet Services' proposed internal and external labour escalators. While the Draft Decision also used an average of DAE and CIE forecasts, the AER:⁸⁶

- Updated AusNet Services' WPI index by adopting the CIE November 2015 forecast and DAE's February 2016 forecast. AusNet Services' Revenue Proposal had adopted forecasts from June 2015 and February 2015 respectively; and
- Applied the updated WPI index to its benchmark estimate of labour costs.

The AER, therefore, rejected AusNet Services' proposed labour and non-labour weights of 78% and 22%, respectively, which were based on AusNet Services' actual 2014-15 opex. The AER substituted 'benchmark' weights of 62% labour and 38% non-labour. In making this decision, the AER considered:

- The benchmark labour weight of 62%:
 - Reflects the labour directly employed by AusNet Services and labour employed by contractors to provide field services; and
 - Is consistent with the AER's approach to measuring productivity;
- Using a TNSP's revealed input mix diminishes its incentive to adopt the most efficient input mix.

The Draft Decision assumed non-field services contractors and non-labour costs will increase in line with CPI.

Output growth

The Draft Decision rejected AusNet Services' approach to forecasting output growth, which used the output growth model applied by the AER in its recent determinations for other TNSPs. This model uses the following output growth measures and weightings:

- Energy delivered (21.4%);
- Ratcheted maximum demand (22.1%);
- Voltage weighted entry and exit connection points (27.8%); and
- Circuit length (28.7%).
- The AER did not forecast any opex attributable to output growth because it considered AEMO will incur the cost of operating and maintaining augmentation and connection assets during the forthcoming period.

The AER also questioned the forecasts of the energy delivered, ratcheted maximum demand and voltage weighted entry and exit connection points included in AusNet Services' Revenue Proposal, stating they did not reconcile with AEMO's forecasts.⁸⁷

Productivity change

The Draft Decision applied a 0.20% productivity change forecast, based on the average annual opex productivity growth achieved in the transmission sector from 2006-15. This was slightly lower than AusNet Services' proposed productivity forecast of 0.28%, which was based on 2006-14 data and relied on a different method of calculating average annual growth.

⁸⁶ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 53.

⁸⁷ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, pp. 55-56.

4.4.2 Response to Draft Decision

Real price growth

There are two key aspects to the Draft Decision on real price growth. These are:

- The best available EGWWS WPI forecast; and
- The most appropriate labour and non-labour weights.

AusNet Services' respective responses are below.

The best available EGWWS WPI forecast

The Draft Decision considered that an average of DAE's February 2016 and CIE's November 2015⁸⁸ EGWWS WPI forecasts represented the best available forecast of directly employed and contracted field services labour cost increases. The AER stated that:

*"We have used forecast growth of the Victorian utilities WPI to forecast labour price growth. We consider the average of the utilities WPI growth forecasts from DAE and CIE represents a realistic expectation of the cost inputs required to achieve the opex objectives. AusNet Services has adopted this approach in its proposal, the only difference being that we have used the latest available forecasts from DAE and CIE rather than the now outdated forecasts used by AusNet Services."*⁸⁹

AusNet Services accepts that the EGWWS is an appropriate WPI measure to forecast labour cost increases, and agrees that an averaging approach is an acceptable methodology for forecasting labour price growth.

AusNet Services has engaged CIE to develop an updated EGWWS WPI forecast (provided at Appendix 4A).

CIE's updated forecast, which is similar to that adopted by the AER in its Draft Decision, reflects the latest data on actual wage growth in the utilities sector, and updated forecasts of the macroeconomic drivers of wage growth over the forthcoming period (e.g. economic growth, capital stock growth, etc.).

When comparing its updated EGWWS WPI forecast with DAE's February 2016 forecast, CIE observed the following:

"DAE expects weaker real growth in the utilities WPI than the CIE (especially in the short term). This is because DAE expect relatively weak growth in activity (and thus in labour demand) in utilities, which comes from weaker growth in the economy (in general), and relatively weak growth in the utilities industry (in particular). Weaker growth in industries that compete for similar labour to utilities is also noted. However, since DAE's forecasts were published (February 2016), GDP figures have come out suggesting growth in the utilities sector has improved. Utilities GVA grew by 2.4 per cent in the 2015-16, up from growth of 1.4 per cent in 2014-15 and a contraction of 2.4 per cent in 2013-14.

*Recent real growth in utilities wages is consistent with the long-run trend in the industry. The CIE's forecast implies this will continue."*⁹⁰

The CIE forecast has been averaged with DAE's February 2016 forecast (as adopted by the AER) to determine a forecast of EGWWS WPI growth for the forthcoming period. In conjunction with the labour and non-labour weights discussed in the next section, this forecast has been used to escalate labour costs for the forthcoming period. AusNet Services expects that an updated DAE forecast will be obtained by the AER for the Final Decision.

⁸⁸ This forecast was provided in AusNet Services' Revised Proposal for its 2016-20 Electricity Distribution Price Review.

⁸⁹ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 53.

⁹⁰ The Centre for International Economics, *Labour price forecasts*, September 2016, p. 36.

Table 4.2: Forecast EGWS WPI growth

Forecast	2017-18	2018-19	2019-20	2020-21	2021-22
CIE, August 2016	1.05%	1.07%	1.06%	1.00%	0.97%
DAE, February 2016	-0.03%	0.61%	0.94%	1.07%	1.08%
Average	0.51%	0.84%	1.00%	1.04%	1.03%

Source: Centre for International Economics, *Labour price forecasts, September 2016*; DAE, *Forecast growth in labour costs in NEM regions of Australia, February 2016*.

The most appropriate labour and non-labour weights

The Draft Decision applied benchmark weights of 62% labour and 38% non-labour, respectively, in place of AusNet Services' proposed weights. AusNet Services does not accept the AER's benchmark weights and has maintained weights that reflect its actual, revealed costs. It is relevant to note that AusNet Services' total opex, including its actual labour weights, has consistently outperformed the average "benchmark" TNSP opex. It appears, contrary to the NER, that the AER recognises the benefits of AusNet Services' efficient opex outperformance for customers without providing for the *actual* efficient costs.

A number of flawed assumptions are made in support of the use of the benchmark weights in the Draft Decision, including that:

- The benchmark weights are appropriate in the absence of more precise information;
- Non-field services labour costs will increase in line with CPI;
- The benchmark weights are intrinsically linked to productivity growth; and
- Using a TNSP's actual weights would provide an incentive to use more than the efficient proportion of internal labour.

The AER's assumptions mean that the use of the benchmark weights in the rate of change calculation will not result in a forecast of opex that is required to meet the opex objectives.

The remainder of this section assesses the validity of each of these assumptions.

Are the benchmark weights appropriate in the absence of more precise information?

The AER's benchmark weights are based on an index constructed by Economic Insights for the purposes of deflating opex for its benchmarking analysis, which in turn are based on analysis conducted by the Pacific Economics Group (PEG) that is now 12 years old.⁹¹

The outdated PEG analysis was based on estimated information and for a different purpose to that which Economic Insights, and the AER, now use it. This means the benchmark weights are not reflective of the efficient labour mix AusNet Services currently utilises, and which is reflected in its base year opex. AusNet Services has delivered significant efficiency improvements over time by, among other things, varying its input mix, benefitting customers through lower prices.

The AER has not provided sufficient explanation as to why, in light of these shortcomings, it considers the benchmark weights based on this data to be more appropriate than an efficient TNSP's actual base year weights, particularly where it has been acknowledged by the AER that the actual costs associated with these weights are efficient. If actual data is currently unavailable, it is open to the AER to require it as part of the extensive data gathered through the Economic Benchmarking and Category Analysis RINs.

⁹¹ Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and ACT Electricity DNSPs*, November 2014, p. 14.

Notwithstanding the shortcomings of the PEG data, the use of external benchmark weights, insofar as they do not reflect an efficient TNSP's actual weights, runs counter to the AER's preferred method of forecasting opex using revealed costs. Specifically, the AER's approach is a significant departure from the established principle to use a TNSP's actual costs, where these costs are found to be efficient, to develop forecast opex required to achieve the opex objectives. Failure to take the actual costs more accurately into account will produce a result which is inconsistent with the Revenue and Pricing principles applicable to a TNSP under section 7A of the NEL.

For the reasons above, AusNet Services has applied its proposed EGWWS WPI forecast using the weights adopted in the Revenue Proposal, with labour and non-labour weights of 78% and 22%, respectively. Continued application of the benchmark weights provides an opex forecast that is insufficient to meet the opex objectives. This is because it would result in a rate of change, and subsequently a total opex forecast, that is not reflective of the efficient costs a prudent operator would require.

While the Draft Decision applied the EGWWS WPI forecast only to the AER's view of internal labour and field services contracts, AusNet Services considers that CPI is not an appropriate estimate for non-field services labour costs, and that all labour costs will increase at the same rate. The reasons for this are discussed further in the following section.

Will non-field services labour costs increase in line with CPI?

The AER has determined that AusNet Services' non-labour costs, as well as its "non-field services" contracts (e.g. legal and accounting services, market research services, administrative services, etc.) will increase at the same rate as CPI.

The AER has therefore applied no real growth to (its view of) AusNet Services:

- Non-labour costs; and
- Non-field services contract costs.

While AusNet Services accepts that non-labour costs should be escalated at CPI, it does not accept the AER's position on applying CPI to non-field services contracts where these contracts comprise labour costs.

AusNet Services considers that all labour, including non-field services, should be escalated using the best available EGWWS WPI forecast. When rejecting the use of the Construction WPI to escalate field services contracts, the AER has said that:

*"The ABS takes into account the nature of the business, not the nature of the work undertaken, when allocating a job to an industry. The ABS labour price statistics for the EGWWS industry reflects both specialised electricity distribution network related labour **and general labour** [emphasis added]. We consider regardless of the nature of the task, if labour is employed by a business that operates in the utilities industry, then it should be escalated by the EGWWS industry forecast. For this reason we have adopted the EGWWS classification for all labour."*⁹²

In forming this view, the AER quoted the following advice it received from the Australian Bureau of Statistics:

*"...regardless of the type of job, if the job was selected from a business classified to the electricity, gas, water and waste services industry, the jobs pay movements contributes to this industry."*⁹³

The AER's assumption that the costs of non-field services labour providing services to the utilities industry will not increase in line with the EGWWS WPI, and that these costs should

⁹² AER, *AusGrid draft decision* | Attachment 7: Operating expenditure, November 2014, p. 147.

⁹³ *Ibid*, p. 147.

therefore be escalated using CPI, directly contradicts its views set out above, and those of the ABS. This is because the AER is inconsistently treating non-field labour resources based solely on whether these resources are directly employed or outsourced, and effectively penalising TNSPs that choose to outsource rather than directly employ labour resources. This is because non-field services contracts represent labour that could be utilised through either an outsourcing or insourcing model, or a combination of both.

For example, AusNet Services maintains an “in-house” legal group to provide day-to-day legal advice, but also engages external legal resources where necessary (i.e. depending on the particular expertise required or where internal resource constraints apply). The decision to outsource or insource is based on whatever resourcing mix allows the company to obtain the best legal advice on the most efficient basis.

The AER has therefore assumed that by virtue of being engaged through an outsource model, non-field services labour will increase at CPI, whereas if the same resources had been directly employed and thus formed part of the EGWWS WPI – as recognised by the AER and the ABS – its cost would be expected to increase in line with the EGWWS WPI forecast.

By penalising TNSPs for outsourcing non-field services, the AER is creating a perverse incentive to directly employ to the greatest extent possible. This outcome undermines the central purpose of incentive regulation, which is to encourage efficiency improvements by, among other things, employing the most efficient resources, whether they be provided by employees, contractors or other outsourced resources.

The Draft Decision also states that forecasting the price of non-field services using a labour price measure (i.e. the EGWWS WPI) is inappropriate because non-field services include inputs other than labour. AusNet Services acknowledges that labour is not the only input used to provide non-field services. However, it does not follow that CPI is a better forecast of non-field services costs than the EGWWS WPI. In particular, the non-field services costs AusNet Services incurs relate to labour-intensive professional services, such as consulting, legal and audit services. It is unreasonable to assume that the costs of these services will not increase in line with other labour costs.

The AER has attempted to demonstrate that non-field services costs will increase in line with CPI by comparing historical growth across a range of productivity price indices (PPIs) it has presumed are reflective of AusNet Services’ non-field services costs.⁹⁴ However, no evidence has been presented that the composition of AusNet Services’ non-field services labour reflects these weights.

Notwithstanding the accuracy of these weights, obtaining expert forecasts of PPI growth would produce a better forecast of real price growth than the approach adopted in the Draft Decision. This would also align with the forecasting approach applied to internal and field services labour, where AusNet Services and the AER agree that an approach based on the best forecast of the EGWWS WPI is the most appropriate approach, in line with the ex-ante regulatory framework applying to opex.

For the reasons set out above, AusNet Services does not agree with the AER’s assumption that non-field services will increase in line with CPI, and maintains that the best available EGWWS WPI forecast should be used to escalate these costs.

- Are the benchmark weights intrinsically linked to productivity growth?

The AER considered benchmark weights are required for consistency with the way it has defined inputs when it measures and forecasts productivity, and that the Revenue Proposal has

⁹⁴ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 49.

not consistently defined opex inputs for the real price growth and productivity forecasts.⁹⁵ When justifying why it had escalated non-field services contracts using CPI, the AER stated:

“How we define our inputs, and the weights we assign to them, is intrinsically linked to productivity growth. For non-field services we capture productivity growth in the price growth component. For field services we capture the productivity growth of contractors in the productivity growth component of our rate of change. We do this both when we measure and forecast productivity growth as well as when we forecast price change.

Alternatively we could allocate all service contracts, both field and non-field, to non-labour costs since the service provider is purchasing a service rather than labour directly. This would have resulted in a lower labour weight and lower forecast price change. However, this would not be consistent with how we have defined our inputs when we measured and forecast productivity growth. Similarly AusNet Services' proposal does not define its opex inputs consistently for its productivity growth forecast and its price growth forecast. For price growth it defines contracted services as entirely labour, but for productivity growth it defines its opex inputs the same as we do. Consequently AusNet Services' forecast rate of change overstates the increase in efficient opex over the 2017–22 regulatory control period.”⁹⁶

AusNet Services disagrees with the AER regarding the link between the labour weights used in the real price growth forecast and those used in the productivity model.

The opex productivity model referred to by the AER compares inputs – opex in this case – with outputs for a given year to determine a productivity score. Annual changes in productivity scores are used to measure historical changes in productivity and, in some cases, to forecast productivity growth.

The labour weights applied in the productivity model are used solely to form a price index for the purposes of inflating nominal opex inputs into real terms. This has been explained by Economic Insights as follows:

“The price of opex is taken as a weighted average of the Electricity, gas, water and waste sector (EGWW) Wages price index (WPI) and five ABS Producer price indexes (PPIs) as used in Economic Insights (2012a) and using opex shares reported in PEG (2004) based on analysis of Victorian electricity DNSP regulatory accounts data. The component price indexes and weights are as follows:

- *EGWW sector WPI – 62.0 per cent*
- *Intermediate inputs – domestic PPI – 19.5 per cent*
- *Data processing, web hosting and electronic information storage PPI – 8.2 per cent*
- *Other administrative services PPI – 6.3 per cent*
- *Legal and accounting PPI – 3.0 per cent, and*
- *Market research and statistical services PPI – 1.0 per cent.”⁹⁷*

Accordingly, the productivity model does not “define” opex inputs as labour or non-labour, as asserted by the AER. Instead, it relies on total opex, adjusted for inflation, as the sole input. The opex productivity model is, therefore, neither sensitive nor sophisticated enough to attribute productivity improvements to different labour or non-labour inputs.

Consequently, the AER is using the labour weights for a different purpose to that for which they were originally developed. The use of the labour weights as a price index assumption when

⁹⁵ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 50.

⁹⁶ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 50.

⁹⁷ Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and ACT Electricity DNSPs*, November 2014, p. 14.

calculating opex productivity does not justify the use of the same weights to forecast the rate of change. This is because the real price change component of the rate of change is intended to capture future changes in the real cost of inputs, not measure productivity improvements.

Furthermore, by stating “for non-field services we capture productivity growth in the price growth component,”⁹⁸ the AER is contradicting its preferred approach of capturing all forms of productivity in the productivity component of the rate of change:

“One of the refinements to our opex assessment approach will be how we incorporate productivity improvements. Previously, we did not forecast a single productivity measure. This created a risk of double counting productivity gains when, for example, we considered economies of scale and labour. As a result, we only applied economies of scale to output growth escalation.

Over time, we intend to develop a single productivity forecast through econometric modelling of the opex cost function (see Attachment A). Applying this single productivity forecast helps avoid the risk of double counting productivity growth. Another advantage of this approach is that it should be more transparent than our previous approach.”⁹⁹

In contrast, AusNet Services’ approach of forecasting non-field services contracts using the EGWS WPI ensures productivity is captured only in the productivity component of the rate of change and, therefore, is consistent with the Guideline. Because labour and non-labour weights are only required to be defined for the real price change component, and not for the measurement and forecasting of productivity, it is also internally consistent.

Does using a TNSP’s actual weights provide an incentive to use more than the efficient proportion of internal labour?

The AER stated that “using a firm’s revealed input mix diminishes its incentive to adopt the most efficient input mix.”¹⁰⁰ The AER considered that if a firm knew its revealed input mix would be used to forecast the rate of change then it would have an incentive to increase its use in the base year of the input that will increase in price more rapidly.¹⁰¹

In support of this assumption, the AER referred to advice from Mr Jeff Balchin to ElectraNet regarding how opex should be trended forward after the base year in order to be consistent with the incentive framework for opex. The AER stated that:

“Mr Balchin’s analysis shows that using a firm’s revealed input mix provides a disincentive to use less of an input that is increasing more rapidly in price because it would reduce the forecast rate of change.”¹⁰²

AusNet Services considers the AER has misstated the findings of Mr Balchin’s report. Mr Balchin’s analysis does not support the use of the benchmark labour weights to forecast opex, nor does it identify incentive issues associated with using a TNSP’s revealed input mix to forecast opex, as the AER has claimed.

Instead, Mr Balchin’s analysis focused on whether observed efficiency savings should be factored into the opex forecast. The analysis concluded that it would be inappropriate for a regulator to assume that an observed efficiency saving could be replicated in a future regulatory period, because doing so would reduce the incentives to outperform such an opex allowance:

⁹⁸ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 50.

⁹⁹ AER, *Expenditure Forecast Assessment Guideline – explanatory statement*, p. 66.

¹⁰⁰ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 51.

¹⁰¹ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 52.

¹⁰² *Ibid.*

*“What these figures demonstrate is that if a TNSP’s revealed efficiency gains are factored into **both** the setting of the starting point for the new regulatory allowance (the base year) and into the assumed change in expenditure from that point onwards, then the reward (penalty) from an improvement (decline) in operating expenditure is substantially diminished.”¹⁰³*

Accordingly, Mr Balchin’s report does not show that “using a firm’s revealed input mix provides a disincentive to use less of an input that is increasing more rapidly in price”, as purported by the AER. In fact, and in contrast to the conclusions drawn by the AER, Mr Balchin’s analysis demonstrates that the combination of an opex forecast based on **revealed costs** and an EBSS achieves the intended sharing of efficiency gains.¹⁰⁴

AusNet Services also considers the AER’s concerns regarding the incentive properties of using revealed labour weights are unfounded due to the discretion the AER has when determining base year opex. If the AER is not satisfied the revealed costs or weights in a proposed base year are efficient, it has the discretion to adopt a different base year or adjust the revealed weights. This would mean that customers would not pay for opex forecasts that had been artificially increased in the event a TNSP did behave in the manner suggested by the AER, which presumably is the issue the AER is trying to address.

Finally, the mix of labour and non-labour in base opex reflects the TNSP’s experience of the most efficient mix of inputs that allows it to meet its obligations. By stating that it cannot assume a business’ revealed costs are efficient, the AER is contradicting its high level assessment that AusNet Services has an efficient level of total opex. The AER is also implying that the EBSS only provides an incentive for TNSPs to achieve an efficient level of total opex, but not to achieve an efficient mix of labour and non-labour inputs. However, the EBSS operates on the TNSP’s revealed opex and makes no distinction between the source of the efficiency gain.

For the reasons set out above, the AER’s concerns with respect to the incentives created by the use of actual labour and non-labour weights are unfounded, and are not reasonable justification for the application of its benchmark weights.

The NER require the AER to approve a total opex forecast that allows AusNet Services to recover at least its efficient costs. As demonstrated in the sections above, the benchmark weights are not consistent with such a forecast. Accordingly, the use of the AER’s benchmark weights is an issue that should be explored at the next Expenditure Forecast Assessment Guideline review, to ensure the real price growth forecasting approach applied by the AER meets the requirements of the NER.

Output growth

AusNet Services accepts the Draft Decision on output growth.

The AER rejected the proposed output growth as it considered AEMO will incur the cost of operating and maintaining (O&M) augmentation and connection assets during the forthcoming period. The AER stated:

“AusNet Services will not require additional opex to inspect, assess the condition of and maintain new assets installed in the 2017–22 regulatory control period.”¹⁰⁵

AusNet Services accepts that AEMO or distributors will incur the O&M costs associated with augmentation of shared network and connection assets in the forthcoming period.

¹⁰³ PWC, *Operating expenditure efficiency assumption and the efficiency benefit sharing scheme*, January 2013, p. 7.

¹⁰⁴ PWC, *Operating expenditure efficiency assumption and the efficiency benefit sharing scheme*, January 2013, p. 6.

¹⁰⁵ AER, *Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22*, July 2016: Attachment 7 – Operating expenditure, p. 37.

Productivity change

AusNet Services does not accept the application of a 0.20% productivity growth forecast.

The Revenue Proposal included a productivity forecast of 0.28% based on annual average growth over 2006-14. This was determined using an approach applied by the AER in its 2015 TransGrid and TasNetworks determinations.

The productivity forecast applied in the Draft Decision was based on analysis conducted by Economic Insights. This analysis used an updated 2006-15 dataset and calculated industry-wide average annual productivity growth using the trend growth method,¹⁰⁶ rather than the annual average growth method. The AER also amended data relating to the voltage-weighted entry and exit points output variable and the MVA rating of lines.

AusNet Services accepts the updates to the 2006-15 dataset used to calculate historical productivity. However, AusNet Services does not accept the AER's adoption of a trend growth method because it does not consider the 2015 data point to be an outlier, as claimed by the AER. AusNet Services considers the AER's previously adopted average annual growth method is a more appropriate method for calculating historical productivity. This method shows that, on average, productivity growth has been negative from 2006-15.

Accordingly, AusNet Services is forecasting no change in productivity growth. In light of the different productivity forecasts produced by the alternative methods, and the absence of strong reasons to depart from the approach applied by the AER in recent transmission resets, AusNet Services considers a zero forecast is the best forecast of productivity change over the forthcoming period.

A forecast of zero productivity change would also align with recent AER decisions for other service providers, as well as the productivity exhibited by the utilities industry overall since 2006.

AusNet Services also notes the Draft Decision has double counted productivity growth due to economies of scale because this is captured in both the Group 3 roll in opex and the productivity forecast. The productivity forecast therefore overestimates the productivity growth an efficient and prudent TNSP will be able to achieve in the forthcoming period.

Each of these issues is discussed further below.

The AER's change in approach is not justified

In the 2014-18 TransGrid determination and 2014-19 TasNetworks determination, the AER applied a productivity forecast of 0.86% based on average, industry-wide productivity growth from 2006-13. This average was calculated using the annual average growth method.¹⁰⁷

In contrast, the Draft Decision applied a productivity forecast based on productivity growth from 2006-15 using the trend growth method. The AER considered this method was more appropriate based on advice from Economic Insights.

Economic Insights considered that because the average annual growth method is influenced by outliers at either the start or end of the time period, the trend growth method was more appropriate. Economic Insights also pointed to an increase in Powerlink's opex in 2015 that it considered was not reflective of recurrent opex:¹⁰⁸

"In the case of Powerlink at least, there is evidence that the increase in reported opex at the end of the series is a one-off and not a reflection of recurrent opex. In its regulatory proposal Powerlink has reduced its reported opex in 2015 by 12.6 per cent to allow for non-recurrent factors as part of the process of forming its base year opex for forecasting

¹⁰⁶ The trend growth method estimates a line of best fit through transmission industry productivity results over the period to produce an estimate of opex productivity growth.

¹⁰⁷ AER, *Transgrid Draft Decision*, Attachment 7 – Operating expenditure, November 2014, p. 77.

¹⁰⁸ Economic Insights, *Memorandum to the AER*, 29 April 2016, p. 5.

purposes (Powerlink 2016, pp.5–6). Most of this reduction was attributed to a cancelled project.”¹⁰⁹

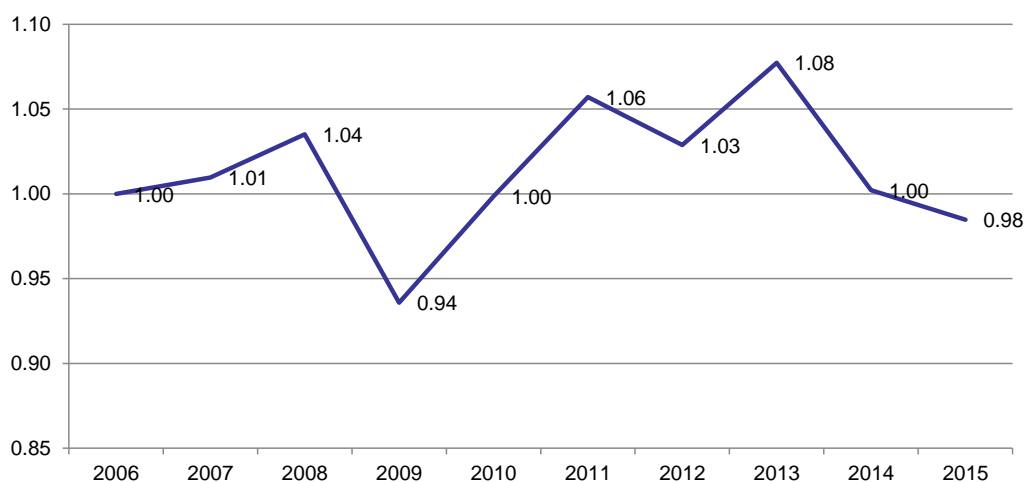
In response to Economic Insights’ advice, the AER stated:

“We agree with Economic Insights that we should use the trend method to measure productivity growth because it is less sensitive to outlier values in the first or last years of the data series.”¹¹⁰

Accordingly, the AER has justified departing from the average annual growth method based on the conclusion that the 2015 data point is an outlier. This shift away from the average annual growth method creates inconsistency across regulatory reviews. More importantly, AusNet Services does not consider that Powerlink’s non-recurrent opex in 2015 warrants the adoption of a new productivity forecasting method because 2015 industry productivity is not an outlier.

The reduction in Powerlink’s productivity by 10% in 2015 does not mean that industry-wide productivity in 2015 is an outlier. The Figure below shows the historical productivity scores calculated by Economic Insights.

Figure 4.3: Industry-wide opex productivity



Source: AusNet Services

This figure shows that industry productivity declined by 7% in 2014 before decreasing by 1.7% in 2015, suggesting that the change in productivity in 2015 is consistent with recent trends.

The figure also shows that annual changes in productivity from 2006-15 have typically been greater than the 1.7% reduction that occurred in 2015. In fact, the 1.7% change in productivity in 2015 is the smallest year-on-year change in industry productivity to occur since 2007.

AusNet Services also considers that Powerlink’s 10% change in productivity is a relatively normal level of change when viewed in the context of changes in other TNSPs productivity over time. As observed by Economic Insights, the productivity of other TNSPs changed by similar magnitudes in 2014 or 2015:

“From figure 5 we can see that opex partial productivity trended up from 2006 to 2013 before falling in 2014 and again in 2015 although to a lesser extent in 2015. The 2014 fall of nearly 7 per cent in TNSP industry opex levels was driven principally by a fall of **16 per cent** in TransGrid’s opex productivity. TransGrid’s opex productivity then grew by 4.4 per cent in 2015. Similarly, the 2015 fall of nearly 2 per cent in TNSP opex productivity was driven

¹⁰⁹ Economic Insights, Memorandum to the AER, 29 April 2016, p. 5.

¹¹⁰ AER, Draft Decision – AusNet Services transmission determination 2017-18 to 2021-22, July 2016: Attachment 7 – Operating expenditure, pp. 57-58.

principally by falls of 10 per cent in Powerlink’s opex productivity and 11.6 per cent in AusNet’s opex productivity.”¹¹¹

The Table below, which shows annual changes in TNSP opex productivity score since 2007, demonstrates that Powerlink’s 10% reduction in productivity in 2015 is not an outlier when compared to other TNSPs and other years.

Table 4.3: Annual changes in TNSP opex productivity

TNSP	2007	2008	2009	2010	2011	2012	2013	2014	2015
ElectraNet	-6%	12%	-5%	-4%	-8%	-7%	6%	-1%	0%
Powerlink	-11%	5%	3%	8%	4%	0%	3%	-7%	-10%
AusNet Services	18%	0%	-60%	137%	14%	0%	3%	-3%	-12%
TasNetworks	9%	-13%	-2%	1%	3%	5%	2%	13%	35%
Transgrid	2%	11%	0%	-12%	12%	-7%	9%	-16%	4%

Source: *Economic Insights; AusNet Services analysis*

Furthermore, the 35% increase in TasNetworks’ productivity in 2015 would be expected to provide an offsetting effect to the reduction in Powerlink’s productivity.

TasNetworks’ productivity gain in 2015 likely reflects the one-off gains from the merger of the Tasmanian electricity transmission and distribution businesses. It is a concern that Economic Insights’ advice does not consider the offsetting impact of TasNetworks’ productivity gain in 2015.

The above analysis demonstrates that the 2015 industry productivity data point has not been made an outlier as a result of Powerlink’s non-recurrent opex and, therefore, the adoption of the trend growth method on this basis is not justified.

The outlook for productivity is unclear

The average annual growth method shows that productivity has declined, on average, by 0.17% per annum since 2006. This contrasts with the trend growth method, which shows annual historical productivity improvements of 0.20% during the same period. Finally, taking a simple average of annual productivity changes over this period produces shows average annual productivity of -0.02%.

The Table below summarises these results, and shows the average of all three methods.

Table 4.4: Annual opex productivity changes

Method	2006-15 annual opex productivity change
Average annual growth	-0.17%
Trend growth	0.20%
Simple average	-0.02%
Average	0.00%

Source: *Economic Insights; AusNet Services analysis*

¹¹¹ Economic Insights, *Memorandum to the AER*, 29 April 2016, p. 5.

The analysis above demonstrates that the historical productivity achieved by the industry varies markedly depending on the method used. It suggests the outlook for productivity in the forthcoming period is unclear, having regard to historical productivity achieved in the industry.

In relation to AusNet Services' own productivity performance, which has declined by 3% and 12% in the most recent years, there is no evidence to support a future productivity gain. In making this observation, it is noted that AusNet Services' overall cost and service performance compares very favourably with its peers.

For the reasons discussed above, AusNet Services considers the annual average growth method is the most appropriate method to use. However, this would result in a negative forecast of productivity being included in the rate of change. AusNet Services is not proposing to apply such a forecast because it would run counter to the regulatory regime AusNet Services operates within, which is designed to foster productivity improvement.

Instead, AusNet Services considers a zero forecast is the best forecast of productivity to apply, given the issues identified above with respect to measuring historical productivity. This would align with the average of the three methods described above. The averaging approach used by AusNet Services and the AER to forecast EGWWS WPI growth – another input to the rate of change – provides support that a zero forecast is reasonable.

It would also align with the AER's recent Final Decision for Australian Gas Networks (South Australia) – published by the AER just two months prior to issuing the AusNet Services Draft Decision – in which the AER approved a zero productivity forecast because it considered this was the best estimate available in the circumstances.¹¹² In respect of this, the AER stated:

*"Based on a review of the material and our own analysis, we were unable to identify a better productivity factor estimate than that proposed by AGN. Therefore, we have concluded that it is reasonable to accept AGN's proposal to apply a zero productivity factor for the forecast period. We consider this is the best estimate available in the circumstances."*¹¹³

A forecast of zero would also align with the overall productivity exhibited by the utilities industry since 2006. Economic Insights' analysis shows that multifactor productivity (MFP) in the utilities sector¹¹⁴ has declined, on average, by 3.4% per annum since 2006.¹¹⁵ While utilities sector MFP is a broader measure than transmission industry opex PFP, the assumption that AusNet Services will be able to achieve positive opex productivity is not reflective of the long-term overall productivity achieved by the utilities sector.

The Draft Decision has double counted economies of scale

Productivity growth reflects a number of factors, including technological improvements, labour productivity, business conditions and economies of scale. The AER's Guideline and previous decisions are clear that the AER's preference is to account for productivity as a single parameter in the rate of change.¹¹⁶

The AER accepted AusNet Services' forecast of opex attributable to the roll in of Group 3 assets for the forthcoming period.

Group 3 costs account for the additional opex required to operate and maintain new assets. These costs were calculated by multiplying the net change in the ratio of regulated to unregulated assets between 1 April 2014 and 1 April 2017 – a 4.03% increase – by a weighted

¹¹² AER, *Final Decision: Australian Gas Networks Access Arrangement 2016-21*, Attachment 7 – Operating expenditure, May 2016, p. 19.

¹¹³ AER, *Final Decision: Australian Gas Networks Access Arrangement 2016-21*, Attachment 7 – Operating expenditure, May 2016, p. 19.

¹¹⁴ Includes organisations across the Electricity Gas, Water and Waste Services industries.

¹¹⁵ Economic Insights, *Memorandum to the AER – supporting spreadsheet*, April 2016, p. 5.

¹¹⁶ AER, *Expenditure Forecast Assessment Guideline – explanatory statement*, p. 66.

scale factor of 59.45%, which reflects the economies of scale that are expected to be achieved across various opex cost categories. The resultant scale factor of 2.39% was then multiplied by base year opex to determine the Group 3 opex forecast.¹¹⁷

The approach outlined above produced a Group 3 opex forecast of \$10 million. Had no economies of scale been assumed, it would have resulted in a forecast of \$16.8 million.¹¹⁸

Accordingly, the economies of scale associated with operating a larger network in the forthcoming period have been accounted for in both the Group 3 opex forecast **and** the productivity forecast. By double counting economies of scale in the opex forecast, the Draft Decision runs counter to the holistic approach to the rate of change advocated by the AER in its Draft Decision:

“Since our rate of change approach is a holistic approach we cannot make adjustments to one component without considering the interactions with other rate of change components.”¹¹⁹

As a result of this double counting, the productivity forecast overestimates the productivity growth an efficient and prudent TNSP will be able to achieve in the forthcoming period. Therefore, the application of the AER’s productivity forecast would not produce a total opex forecast that reasonably reflects the opex criteria, or maintain consistency with the Revenue and Pricing Principles.

Should the AER maintain its productivity forecast of 0.20% in the Final Decision, a corresponding adjustment is required to the Group 3 opex amount to remove economies of scale.

Concluding comments

AusNet Services is forecasting no change in productivity over the forthcoming period. This is considered the most realistic expectation of productivity change over the forthcoming period because:

- The outlook for productivity is unclear, having regard to historical productivity measured using a range of methods;
- It aligns with the:
 - AER’s recent decisions on productivity for other utilities;
 - Productivity exhibited by the utilities industry overall since 2006;
- The Draft Decision opex forecast overestimates the productivity growth an efficient and prudent TNSP will be able to achieve in the forthcoming period because it double counts economies of scale.

4.4.3 Revised Proposal

For the reasons set out above, AusNet Services is proposing rate of change opex for the current regulatory period of \$8.2 million, which accounts for 0.8% of the total opex forecast.

Table 4.5: Revised rate of change forecast (\$m, real 2016-17)

Component		2017-18	2018-19	2019-20	2020-21	2021-22	Total
Real price growth	%	0.40%	0.66%	0.78%	0.81%	0.80%	N/A

¹¹⁷ AusNet Services, *Revenue Proposal*, October 2015, p. 134.

¹¹⁸ Removing economies of scale from the calculation increases the scale factor by 68% (from 2.39% to 4.03%), increasing the Group 3 opex forecast by the same proportion.

¹¹⁹ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 44.

Component		2017-18	2018-19	2019-20	2020-21	2021-22	Total
	\$	0.3	0.9	1.6	2.3	3.0	8.2
Output growth	%	0.00%	0.00%	0.00%	0.00%	0.00%	N/A
	\$	0.00	0.00	0.00	0.00	0.00	0.0
Productivity growth	%	0.00%	0.00%	0.00%	0.00%	0.00%	N/A
	\$	0.0	0.0	0.0	0.0	0.0	0.0
Rate of change	%	0.40%	0.66%	0.78%	0.81%	0.80%	N/A
	\$	0.3	0.9	1.6	2.3	3.0	8.2

Source: AusNet Services

4.5 Roll in of Group 3 Assets

AusNet Services accepts the Draft Decision on opex attributable to the roll in of Group 3 assets for the forthcoming period, subject to the application of the approved scale factor to estimated final year opex.

4.5.1 Draft Decision

The AER accepted AusNet Services' forecast of opex attributable to the roll in of Group 3 assets for the forthcoming period. The AER noted it had concerns with AusNet Services' approach, namely that it:

- *“may overstate the output growth associated with the rolled in group 3 assets because the group 3 assets have not been depreciated as much as the assets already in the asset base*
- *is influenced by replacement capex, which does not relate to an increase in output*
- *is influenced by the value of unregulated assets that are not group 3 assets, which will not impact the opex associated with operating and maintaining its regulated assets.”¹²⁰*

Despite these concerns, because the opex forecast under alternative approaches was not materially different to AusNet Services' forecast, the AER accepted that AusNet Services' forecast reasonably reflects the efficient costs of operating and maintaining Group 3 assets.

4.5.2 Response to Draft Decision

AusNet Services accepts the Draft Decision on opex attributable to the roll in of Group 3 assets for the forthcoming period, subject to the application of the approved scale factor of 2.39%¹²¹ to the estimated final year opex shown in section 4.2. This slightly increases the Group 3 opex being proposed compared to the amount approved in the Draft Decision.

4.5.3 Revised Proposal

The Table below shows AusNet Services' forecast opex of \$10.4 million to account for the roll in of Group 3 assets, which accounts for 1% of the total opex forecast.

¹²⁰ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 37.

¹²¹ AusNet Services, *Revenue Proposal*, October 2015 p. 134.

Table 4.6: Forecast opex impact of Group 3 assets (\$m, real 2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Group 3 roll in opex	2.1	2.1	2.1	2.1	2.1	10.4

Source: AusNet Services

4.6 Step Changes

AusNet Services does not accept the Draft Decision on step changes, with the exception of the new emergency response arrangements step change.

4.6.1 Draft Decision

AusNet Services' Revenue Proposal included six step changes for the forthcoming period, totalling opex of \$13.5 million. The AER rejected all six step changes for the following reasons:¹²²

- **Establishment of IT security team (\$3.3 million).** The AER rejected this step change on the grounds that it was not driven by a new or changed regulatory obligation and that relatively small increases in discretionary opex could be funded through reductions in other discretionary expenditure.
- **New emergency response arrangements (\$1 million).** The AER rejected this step change because it considered AusNet Services did not identify the specific compliance requirements or explain why these requirements impose a greater burden than business as usual.
- **Smart Aerial Image Processing (SAIP) roll out (\$0.9 million).** While the AER rejected this step change on the basis that AusNet Services' analysis of the benefits of SAIP was not sufficiently rigorous, it accepted that SAIP generally is an effective technique for monitoring the condition of a network.
- **Synchronous condensers (\$4.3 million), Morwell Power Station assets (\$1.9 million) and WMTS mobile switchboard (\$2 million).** The AER agreed that the proposed opex solutions are prudent and efficient, but rejected the step change opex on the grounds that it is already accounted for in the base year. The AER considered that the relevant costs are a part of normal operations, and would be offset by reductions in other areas of expenditure as variations in non-recurrent opex tend to offset each other so that total opex is relatively stable.

4.6.2 Response to Draft Decision

AusNet Services accepts the Draft Decision on the new emergency response arrangements step change.

AusNet Services does not accept the Draft Decision on other step changes and continues to forecast the following step changes in this Revised Revenue Proposal:

- Establishment of IT security team;
- Smart Aerial Image Processing (SAIP) roll out;
- Synchronous condensers;
- Morwell Power Station assets; and

¹²² AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, pp. 62-70.

- WMTS mobile switchboard.

Since AusNet Services submitted its Revenue Proposal, the Victorian Government has committed to implementing a Victorian renewable energy auction scheme (VREAS) aimed at incentivising significant new renewable energy investment. This scheme is intended to support the achievement of the Victorian Government's renewable energy targets to ensure that 25 per cent of the State's electricity generation comes from renewable sources by 2020, rising to 40 per cent by 2025.

A consultation paper regarding the design of the scheme was published in August 2016. At this stage the final design of the scheme is unclear, but, as flagged in the consultation paper, it is possible that AusNet Services' transmission network may have a role in scheme administration and cost recovery. AusNet Services considers that the administration of the scheme is most appropriately performed by a State Government Department and the cost recovery function by AEMO, given it sets Transmission Use of System charges.

However, if the final design of the VREAS did obligate AusNet Services to perform either of these roles, this could impact efficient revenues. Depending on the final design of the VREAS, there may be additional costs for AusNet Services (requiring additional opex allowance), and other provisions (such as a designated cost pass through) may be required to facilitate the collection of revenues related to the scheme.

Due to the current uncertainty about the final scheme design, this Revised Revenue Proposal does not include any explicit proposal to recover any costs associated with the scheme. If the design of the scheme is finalised prior to AusNet Services' Final Decision, we will update the AER on any implications for our Revised Revenue Proposal.

The remainder of this section discusses the five step changes being proposed by AusNet Services.

Establishment of IT security team

The AusNet Services does not accept the Draft Decision on the establishment of a dedicated IT security monitoring and response team.

This step change, which comprises opex of \$3.3 million, was proposed in the context of an increasing level of cyber security threats being faced by large organisations, as recognised by ASIC in March 2015 when it published a report recommending a cyber-security framework for ASX-listed organisations. These threats present a significant risk to operators of critical infrastructure, such as Victoria's electricity transmission network.

The Draft Decision rejected this step change on the grounds that it was not driven by a new or changed regulatory obligation and that relatively small increases in discretionary opex could be funded through reductions in other discretionary expenditure. The AER stated:

"We consider a service provider should be able to fund relatively small increases in discretionary opex without forecasting an increase in total opex. As with many types of expenditure, AusNet Services has flexibility as to what form and scope of IT security it undertakes and how much it spends on this area of opex."¹²³

For the reasons set out below, AusNet Services considers the AER's decision to reject this step change is unreasonable and would result in the AER determining a total opex forecast that does not reasonably reflect the opex criteria.

¹²³ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 63.

Box 4.3: Response to stakeholder feedback on AusNet Services' IT security obligations

Stakeholders asked whether, as the owner of critical infrastructure, AusNet Services has legislated IT security obligations.

AusNet Services' transmission network is designated as critical infrastructure under the Victorian Critical Infrastructure Model, which came into effect from 1 July 2015. *Part 7A of the Emergency Management Act 2013* sets out the obligations AusNet Services must comply with to ensure the resilience of the network. However, the Act does not stipulate specific IT security requirements.

As discussed in section 5.10.1 of the Revenue Proposal, the Australian Securities and Investments Commission's (ASIC) published its Cyber resilience: Health Check report in March 2015, recommending a cyber-security framework for ASX-listed organisations. While the adoption of this framework is not currently a legislative obligation, this may change over the coming period given the increasing threat presented by cyber-attacks.

The NER also require that, where there is no an applicable regulatory obligation or requirement to maintain the security of the transmission system, AusNet Services is nonetheless required to do so.

The step change expenditure is required to comply with the NER

AusNet Services disagrees with the AER that the proposed expenditure is discretionary in nature and that it has the level of flexibility assumed by the AER with respect to IT security scope and expenditure.

'Discretionary' implies that choosing not to incur the relevant costs is a viable option for AusNet Services. In light of the potential consequences of a successful cyber-security attack on its network and the expectations of ASIC, shareholders, the general community and other stakeholders, this is not the case. Instead, the step change being proposed is required as a direct consequence of ongoing changes in the cyber security aspect of AusNet Services' operating environment. Because of these changes, the step change expenditure is required to comply with the NER. Therefore, although there is no new regulatory requirement, there are new or evolving factors causing compliance with regulatory arrangements to require this additional expenditure, in much the same way as if there were a new regulation necessitating additional expenditure.

The changing cyber security landscape is demonstrated by recent events that have occurred even since the Revenue Proposal was submitted in October 2015.

For example, on December 23 2015, approximately 225,000 Ukrainian electricity customers experienced unscheduled power outages as a result of a large-scale and coordinated external cyber-attack on multiple Ukrainian electricity distribution companies. The attackers gained access to the companies' computer and SCADA systems through targeted 'spear phishing', initiated power outages through remote operation of substation circuit breakers and, at the conclusion of the attack, wiped some ICT systems using malware and attempted to interfere with restoration efforts. Further details of this attack are provided in a supporting document submitted with this proposal (Appendix 4B).

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While the consequences of this attack were relatively minor compared to the Ukrainian incident, the two events together demonstrate the likelihood and potential consequences of a successful cyber-attack in the Victorian context.

These attacks also demonstrate that cyber-attacks are becoming an increasingly prevalent and dangerous threat to critical infrastructure operators. As demonstrated by the Ukrainian incident, the customer and community impacts of a successful cyber-attack are significant.

Consequently, AusNet Services does not consider expenditure on enhancing its cyber-security capability through the establishment of a dedicated team is discretionary. This is because, in addition to the obligation it has to the community to ensure the security of its ICT, SCADA and

operational systems, AusNet Services is required under the NER to maintain the security of the transmission system.

The NER states that the AER must approve a total opex forecast that reasonably reflects the efficient costs of achieving the opex objectives, which include:

“...to the extent that there is no applicable regulatory obligation or requirement in relation to:

- (i) the quality, reliability or security of supply of prescribed transmission services; or*
- (ii) the reliability or security of the transmission system through the supply of prescribed transmission services,*

to the relevant extent:

- (iii) maintain the quality, reliability and security of supply of prescribed transmission services; and*
- (iv) maintain the reliability and security of the transmission system through the supply of prescribed transmission services; and...¹²⁴*

Accordingly, while an explicit obligation in relation to IT security has not yet been introduced by a regulatory body, the NER is clear that where there is no applicable regulatory obligation or requirement to maintain the security of the transmission system, AusNet Services is nonetheless required to do so. The AER is, therefore, required to approve a forecast that allows AusNet Services to discharge this obligation under the NER.

Since the submission of the Revenue Proposal, the cyber security landscape has continued to evolve rapidly. With the threat level expected to continue to increase throughout the forthcoming period, base year expenditure alone is not sufficient to maintain the security of the transmission system.

Accordingly, as the step change expenditure is not accounted for in the base year, the rate of change or any other element of the opex forecast, not providing for the proposed step change in the opex forecast results in a forecast that is insufficient to achieve the opex objectives and, hence, does not reasonably reflect the opex criteria.

The step change expenditure is material

AusNet Services disagrees with the AER that the step change is a relatively small increase that can be funded through the base level of opex through reductions in other expenditure.¹²⁵

The proposed opex of \$0.7 million per annum equates to around 1% of AusNet Services' controllable opex¹²⁶ of \$81 million in 2015-16 and is hence a material amount. The AER has approved a number of step changes of lower materiality in recent price resets, including:

- The adoption of the Chapter 5A connections framework for AusNet Services' 2016-20 EDPR (\$0.3 million p.a., or 0.2% of base year opex);
- A demand management step change for Jemena's 2016-20 EDPR (\$0.15 million p.a., or 0.2% of base opex);
- The impact of new regulatory guidelines for TransGrid's 2014-18 TRR (\$0.6 million p.a., or 0.40% of base opex).

In making its decision to approve or reject the step changes identified above, as well as other step changes approved by the AER in recent price resets, the AER did not consider materiality – and therefore the extent to which a service provider could fund the step change through base opex through reductions in other expenditure – to be a relevant factor. Instead, the AER

¹²⁴ NER 6A6.6(a)(3).

¹²⁵ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 63.

¹²⁶ Total opex less easement land tax, self-insurance, AIS rebates, NCIPAP opex and movements in provisions.

focused its assessment on whether the driver of the step change was not accounted for in either the base year or the rate of change and, therefore, whether it warranted an increase in the opex forecast

This same approach should be applied consistently to all step change assessments, regardless of the materiality of the step change and whether it is being driven by a change in an explicit regulatory obligation or a changing operating environment. If a step change is for prudent and efficient expenditure, it should be included in the opex forecast given the expenditure will be funded through regulated opex.

Furthermore, as already noted, the costs of the step change are not immaterial and the AER has no reasonable basis for concluding that it can be financed through savings in discretionary opex. In fact, the AER's new approach to forecasting productivity improvements (which AusNet Services does not accept) already requires the achievement of efficiency gains compared to current performance.

For the above reasons, AusNet Services maintains its proposal for a step change for the establishment of an IT security team.

Table 4.7: Forecast opex for establishment of IT security team (\$m, 2016-17)

Establishment of IT security team	2017-18	2018-19	2019-20	2020-21	2021-22	Total
24/7 operations team	0.5	0.5	0.5	0.5	0.5	2.4
Operating systems and network device patching analyst	0.1	0.1	0.1	0.1	0.1	0.5
Software maintenance cost	0.1	0.1	0.1	0.1	0.1	0.4
Total	0.7	0.7	0.7	0.7	0.7	3.3

Source: AusNet Services

Smart Aerial Image Processing roll out

The AusNet Services does not accept the Draft Decision on the Smart Aerial Image Processing (SAIP) roll out.

This step change, which comprises opex of \$0.9 million, was proposed to allow AusNet Services to conduct a full assessment of its entire network using SAIP in order to better predict the extent and optimal timing of future conductor replacements, and avoid initiating replacement works before they are necessary. As discussed in the Revenue Proposal, the proposed expenditure is net of inspection cost savings expected to result from SAIP deployment.

The Revenue Proposal showed that deferring the replacement of 30km of 500 kV conductor by two years in five years' time would economically justify the proposed opex. This represents less than 1% of the length of AusNet Services' 500 kV transmission network of around 3,900km. This was considered a conservative estimate of the potential capex deferral benefits SAIP would facilitate.

The Draft Decision acknowledged that SAIP generally is an effective technique for condition monitoring, but rejected the step change. The AER stated:

"We accept that SAIP generally is an effective technique for monitoring the condition of a network but note that AusNet Services has not provided any evidence from the assessments conducted to date that there is a particular need to focus on the replacement (or deferral) of conductors that would warrant this step change. Given the lack of robust evidence to

support the benefits of any capex savings, we consider a step change in opex is not required in order for our forecast of total opex to meet the opex criteria.”¹²⁷

AusNet Services considers the Draft Decision is inconsistent with the AER’s EFA Guideline, which provides for the approval of opex step changes where they result in a capex/opex trade-off. This section provides further information on the assessments conducted to date and on the capex saving benefits offered by SAIP.

SAIP assessments conducted to date

Since 2009 AusNet Services has successfully completed a number of SAIP trials on different parts of its transmission network. This includes covering approximately 500 and 1,000 kilometres of the network in 2014-15 and 2015-16, respectively, to confirm the effectiveness of SAIP with respect to identifying signs of deterioration, minor faults and defects and providing an improved mechanism for assessing condition and predicting remaining life of the asset.

In 2013, approximately 62 km of ground-wire between Hazelwood Terminal Station and South Morang Terminal Station was replaced at a cost of approximately \$4.6 million.¹²⁸ This project was carried out after SAIP analysis conducted during 2012 revealed the existing ground-wire was in poor condition due to severe corrosion.

While in this instance SAIP did not result in the deferral of capex, it facilitated the replacement of line assets that posed a material safety risk to lines workers. Furthermore, it would have been significantly more costly to refurbish/replace these assets at a later date, due to the further corrosion damage expected to take place.

This case demonstrates the range of benefits offered by SAIP. These benefits are expected to increase significantly if SAIP analysis of the entire transmission network was conducted, due to the detailed information this would provide on signs of deterioration, minor faults and defects and ultimately, the remaining life of line assets. More robust information on the remaining life of line assets will result in more targeted replacement of these assets over the long-term, thereby generating material capex savings.

If SAIP can inform the early replacement of lines by revealing poorer than expected condition, it can also defer the replacement of lines due to better than expected condition.

In light of the potential risk of delaying replacement too long, there is considerable scope for more targeted and prioritised conductor replacement over the long-term. Without accurate condition data, there would be a need to adopt a more conservative, higher cost, age-based approach to conductor replacement.

In the Draft Decision, the AER stated:

“There is a relatively large stock of conductors and towers commissioned in the 1960’s 1970’s and 1980’s. Based on information provided by AusNet Services we note that for the majority of transmission assets (transmission towers, transmission tower support structures, conductors and transmission cables) the number of assets in service beyond their expected mean economic life is relatively immaterial. This is consistent with AusNet Services’ proposal, which has proposed minimal replacement of conductors and towers.”¹²⁹

This foreshadows a significant conductor replacement program in future regulatory periods. Delaying these works too long increases the failure risk and associated health and safety risks to AusNet Services’ workers and potentially members of the public. SAIP is crucial to ensuring that future conductor replacement is limited only to those lines that are found to be in poor

¹²⁷ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, pp. 66-67.

¹²⁸ This cost is below the cost per km assumed in the NPV analysis for 500kV conductor replacement due to the fact that ground-wire is significantly less costly to replace than 500kV conductor.

¹²⁹ AER, *AusNet Services Draft Decision*, Attachment 6 – Capital expenditure, July 2016, p. 64.

condition and therefore pose such risks, rather than adopting a more conservative, age-based approach.

The benefits of SAIP are robust

The Revenue Proposal demonstrated the net economic benefits of SAIP through a cost-benefit analysis. This analysis showed that if SAIP can defer the replacement of 30km of 500kV conductor (with an estimated project cost of \$30 million) by two years, in five years' time (e.g. in 2020), these cost savings would outweigh the opex required to roll out SAIP across the network.

The AER rejected the proposed step change as it did not consider the cost-benefit analysis demonstrating the benefits of SAIP to be sufficiently rigorous. The AER stated:

“Having assessed AusNet Services' proposed SAIP roll out, we do not consider it has sufficiently identified or quantified the capex savings that will accrue as a result of the increase in opex it has proposed.”¹³⁰

AusNet Services disagrees with the Draft Decision as the analysis above is sufficiently robust to justify the proposed opex. More granular and precise quantification of the capex savings expected to accrue from SAIP is inherently difficult as this would require the condition data that the SAIP roll out will obtain. However, further high level analysis supports our understanding that the proposed opex will result in an efficient capex/opex trade-off and, therefore, is prudent and efficient. This analysis is set out in the Box below, and is also provided in a supporting document to this proposal (Appendix 4C).

Box 4.4: Net economic benefits of SAIP

AusNet Services' transmission network includes around 1,500km¹³¹ of 500kV conductor, of which around 400km was installed in the early 1970s and is therefore at or near the end of its 45 year design life.

Accordingly, it is expected most of this conductor will be replaced in the coming decade. The cost of this replacement will be expensive – capex of approximately \$1 million per kilometre. If SAIP is able to defer the replacement of just 10% of this conductor (i.e. 40km) from 2024 to 2026 (i.e. a deferral of just two years), this will generate capex savings of \$3.1 million in present value (PV) terms. Given the proposed SAIP roll out opex of \$1.6 million in PV terms, the net benefits of SAIP deployment are \$1.5 million.

Net economic benefits of SAIP roll out, 40km of replacement deferred (\$m, 2016-17)

PV terms		2018	2019	2020	2021	2022	2023	2024	2025	2026
Cost of replacement – 40km		40.0	37.7	35.6	33.6	31.7	29.9	28.2	26.6	25.1
Capex saving of two-year deferral				4.4	4.2	3.9	3.7	3.5	3.3	3.1
SAIP roll out costs		0.5	0.5	0.2	0.2	0.2				
PV of capex savings	3.1									
PV of total SAIP roll out costs	1.6									
Net economic benefit	1.5									

The net economic benefit shown above is based on a highly conservative estimate of the potential capex savings SAIP will enable.

As shown below, if the replacement of 50% of the 400km of 500kV conductor (i.e. 200km) is deferred by two years from 2024 to 2026, capex savings of \$15.5 million will be achieved,

¹³⁰ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 66.

¹³¹ The Revenue Proposal stated the 500kV transmission network is around 3,900km. That figure included both conductor (1,500km) and ground-wire (2,400km).

creating a net economic benefit of \$13.9 million. This translates to an annual net economic benefit of \$1.4 million,¹³² significantly outweighing the proposed opex of approximately \$300,000 per annum.

Net economic benefits of SAIP roll out, 200km of replacement deferred (\$m, 2016-17)

PV terms	2018	2019	2020	2021	2022	2023	2024	2025	2026
Cost of replacement - 200km	200.0	188.7	178.0	167.9	158.4	149.5	141.0	133.0	125.5
Capex saving of two-year deferral			22.0	20.8	19.6	18.5	17.4	16.4	15.5
SAIP roll out costs	0.5	0.5	0.2	0.2	0.2				
PV of capex savings	15.5								
PV of total SAIP roll out costs	1.6								
Net economic benefit	13.9								

Source: AusNet Services

Note: Assumes WACC of 6% and cost of replacement of \$1 million per km; assumes SAIP roll out costs are as per Revenue Proposal

The analysis above shows that SAIP has the potential to generate substantial net economic benefits. Hence, failing to include the proposed opex in the total opex forecast is inconsistent with both the AER's EFA Guideline and the NER, which state that in forming a view on whether the opex forecast reasonably reflects the opex criteria, the AER must have regard to the substitution possibilities between operating and capital expenditure.¹³³

Furthermore, the regulatory framework does not provide incentives for opex/capex trade-offs spanning multiple periods. Under the current framework, a service provider is only incentivised to increase opex in order to decrease capex if the capex savings fall within the same regulatory period. This is because capex savings in a subsequent period that have been facilitated by the opex increase will be factored into the capex forecast set for that period. Accordingly, an opex step change is required to fund the opex increases associated with capex/opex trade-offs spanning multiple periods.

Finally, AusNet Services notes that the Draft Decision appears to be contradictory in its assessment of SAIP. The AER accepted that SAIP generally is an effective technique for condition monitoring, but did not approve the opex that will allow AusNet Services to deploy this technique on the grounds that the proposed benefits were not sufficiently identified. The primary purpose of condition monitoring is to ascertain the optimal timing for asset replacement, which is the basis of the capex saving benefits identified by AusNet Services. The AER's position is particularly concerning in light of the incentive issues outlined above.

For the above reasons, AusNet Services considers the SAIP roll out step change is consistent with a total opex forecast that reasonably reflects the opex criteria. AusNet Services is therefore proposing a step change for roll out of SAIP.

¹³² Equal to the total net economic benefits of \$13.9 million in PV terms, annualised over the period 2016 to 2026.

¹³³ NER 6A.6.6 (e)(7).

Table 4.8: Forecast opex for SAIP roll out (\$m, 2016-17)

SAIP roll out	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Roll out	0.5	0.5	0.3	0.3	0.3	1.8
Less: costs in base year	-0.1	-0.1	-0.1	-0.1	-0.1	-0.7
Less: saving on inspection costs	-0.1	-0.1	-0.1	-0.1	-0.1	-0.3
Total	0.3	0.3	0.1	0.1	0.1	0.9

Source: AusNet Services

Synchronous condensers

AusNet Services does not accept the Draft Decision on the decommissioning of the synchronous condensers (SCOs).

This step change, which comprises opex of \$4.3 million, was proposed to fund the decommissioning costs of the three SCOs installed on AusNet Services' network. The SCOs, which regulate the voltage on the network, have reached the end of their design lives. As the Victorian transmission planner, AEMO has advised that these assets can be retired as the service they provide is no longer required.

AEMO also noted its expectation that AusNet Services' opex forecast will be reduced by the operating and maintenance costs of the SCOs (provided as Appendix 4D to this Proposal).¹³⁴ As discussed further in this section, the step change being proposed has been adjusted to remove the operating and maintenance costs that will be avoided with the retirement of the SCOs. The removed costs include \$84,000 of avoided O&M for the Brooklyn Terminal Station SCO, which have been removed from 2016-17.

The Draft Decision agreed that the proposed expenditure to decommission the SCOs was prudent and efficient, but rejected the step change on the basis that the opex is already provided in the base year. The AER considered the costs to be a part of normal operations and would offset by reductions in other areas of expenditure as variations in non-recurrent opex tend to offset each other so that total opex is relatively stable.

AusNet Services considers that by rejecting the SCO step change, the AER has determined a total opex forecast that does not reasonably reflect the opex criteria. This is because the AER's assumptions with respect to the historical treatment of asset decommissioning costs are incorrect and as a result, the decommissioning costs have not been accounted for in any element of the opex forecast. This issue is discussed in further detail below.

Furthermore, the costs are being driven by a change in AusNet Services' obligations under its Network Services Agreement (NSA) with AEMO and, therefore, are justified as a step change under the AER's EFA Guideline approach.

There is a need to set a precedent for the appropriate funding of asset decommissioning, as, given the changing requirements of the network, this is likely to occur more frequently. By not allowing these costs, the incentives that allow TNSPs to make efficient asset management decisions to efficiently retire assets are blunted.

Furthermore, these costs are one-off in nature and do not lead to a permanent increase in opex but rather a permanent decrease in ongoing opex and capex upon removal.

The AER's assumptions with respect to asset decommissioning are incorrect

The Draft Decision stated:

¹³⁴ AEMO, Letter to AusNet Services, dated 10 August 2016.

“We consider asset management, whether it is to prolong the life of an asset (refurbishment) or to end the life of an asset is business as usual for a network service provider. Generally, an efficient base level of opex (rolled forward each year with an appropriate rate of change) is sufficient for a prudent and efficient service provider to manage its assets and in doing so maintain the quality, safety, reliability and security of supply of its network.”¹³⁵

The AER has incorrectly assumed that the cost of routine decommissioning is classified as opex, not capex. When delivering routine replacement capital works, the existing assets being replaced are decommissioned before being replaced with assets that typically provide an equal or increased level of service. As the decommissioning costs form part of a capital project, they are normally capitalised and not expensed.

Accordingly, while AusNet Services acknowledges that asset decommissioning is business as usual, this has historically been carried out solely as part of capital projects. In contrast, the SCOs will be decommissioned and not replaced, and therefore represent costs that are not able to be capitalised. AusNet Services can confirm that projects of this nature are **not** a part of normal operations. In fact, this is the first instance where major assets have been decommissioned without a need for replacement.

Therefore, it is unreasonable to assume that the historical costs used to forecast opex are sufficient to account for the cost of decommissioning the SCOs.

Importantly, as transmission assets age and demand patterns change, situations where assets are decommissioned as standalone projects are expected to become more frequent. The Draft Decision sets a precedent of service providers being unfunded for these costs in future, distorting the incentives for networks to efficiently retire redundant assets.

The decommissioning costs have not been accounted for in the AER’s opex forecast

The AER’s EFA Guideline states that “any other costs base opex and the rate of change do not compensate [sic] can be added as a step change. When assessing step changes particular consideration must be given to whether the costs are already compensated for elsewhere in the opex forecast.”¹³⁶

The AER’s decision on the SCOs is inconsistent with its Guideline. This is because the proposed step change costs, which reflect the efficient costs of achieving the operating expenditure objectives, have not been accounted for any in any element of the opex forecast approved in the Draft Decision. This has resulted in an opex forecast that fails to meet the opex criteria.

The Draft Decision stated that:

“Generally, an efficient base level of opex (rolled forward each year with an appropriate rate of change) is sufficient for a prudent and efficient service provider to manage its assets and in doing so maintain the quality, safety, reliability and security of supply of its network.”¹³⁷

This fails to recognise that base year opex rolled forward each year by the rate of change will not be sufficient to achieve the opex objectives in the case where an abnormal event is forecast to occur in the forthcoming regulatory period. As established above, the decommissioning of assets such as the SCOs is such an abnormal event.

Unless similar events occurred in the base year, or the real price change, output growth or productivity change components of the rate of change account for such events, the opex forecast will preclude the recovery of at least efficient costs. Indeed, the use of the word “generally” implies an acknowledgement that simply rolling forward base year opex will not be sufficient in all cases.

¹³⁵ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 69.

¹³⁶ AER, *Expenditure Forecast Assessment Guideline: Explanatory Statement*, p. 69.

¹³⁷ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 69.

The AER has stated it accepts “that there are activities that were not undertaken in the base year but may be required in other years. However, there are similarly activities that were undertaken in the base year that will not be required in subsequent years.”¹³⁸

The AER also stated, in reference to comments made in AusNet Services’ Revenue Proposal, that:

*“We agree with AusNet Services’ assumption that individual items of non-recurrent expenditure will rise and fall such that total opex is broadly consistent from year to year.”*¹³⁹

The comments made in the Revenue Proposal were specific to the method used to forecast ‘asset works’ opex – which in some previous resets had been forecast on a category-specific basis – and not to forecasting total opex. The approach adopted in the Revenue Proposal implicitly assumes that the level of non-recurrent asset works opex in the base year is sufficient to fund future asset works projects in the forthcoming period.

However, this should not be taken to mean that the base year and hence the total opex forecast is sufficient to fund the non-recurrent activities that have not occurred in the base year, such as SCO decommissioning. AusNet Services does not consider that, by virtue of being a non-recurrent rather than a recurrent cost, the costs of these activities are already captured in the base year.

Neither AusNet Services nor the AER has undertaken an activity-by-activity review of base opex to determine which activities will reoccur over the forthcoming period. This type of exercise would be highly resource intensive and be severely limited by the availability of granular data on individual activities. Nonetheless, it is untrue that decommissioning activities have occurred in the base year.

These circumstances do not mean the assumptions that “there are similarly activities that were undertaken in the base year that will not be required in subsequent years” and hence, forecast opex attributable to abnormal events will be fully offset by cost reductions, are valid assumptions. These assumptions are particularly concerning given the materiality of the decommissioning costs – around 5% of annual controllable opex.¹⁴⁰

The AER has provided no evidence to support its approach, other than identify changes in individual opex categories occurring between 2013-14 and 2014-15:

*“For instance, between 2013–14 and 2014–15, network overheads allocated to opex increased by \$2.8 million between 2013 and 2014. However AusNet Services’ opex only increased by \$1.6 million. AusNet Services was able to limit the reduction in network overheads by reducing its maintenance expenditure by \$1.9 million.”*¹⁴¹

It is reasonable to expect that individual categories of expenditure will vary between years, just as the drivers of expenditure change from year to year. However, it does not logically follow these changes are at the discretion of AusNet Services and that such changes will allow it to absorb a 5% increase in controllable opex.

In contrast, it is clear that an amount of decommissioning costs will be incurred in relation to the SCOs that:

- Is not accounted for in base opex, nor in any element of the forecast; and
- Is material to AusNet Services’ total controllable opex.

¹³⁸ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 69.

¹³⁹ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 70.

¹⁴⁰ Total opex less easement land tax, self-insurance, AIS rebates, NCIPAP opex and movements in provisions.

¹⁴¹ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 69.

The AER has, therefore, determined a total opex forecast that does not reasonably reflect the opex criteria.

The decommissioning costs are being driven by a change in AusNet Services' obligations

As noted by the AER, AEMO has confirmed the synchronous condensers are no longer justified by market benefits and can be retired.¹⁴²

AEMO has also provided formal notice that, under its NSA with AusNet Services, the network services provided by AusNet Services may be reduced to reflect the retirement of the SCOs. AEMO also noted its expectation that AusNet Services' Revised Revenue Proposal opex forecast will be reduced by the operating and maintenance costs of the SCOs.¹⁴³

Under the provisions of its Victorian Transmission Licence, AusNet Services is required to enter into an NSA with AEMO.¹⁴⁴ This makes the NSA a quasi-regulatory instrument with which AusNet Services must comply. The NSA in place between AEMO and AusNet Services sets out the network services AusNet Services is obligated to provide, for which it is compensated by AEMO. Where the scope of these network services is varied, as confirmed by AEMO in the case of the SCOs, this equates to a change in AusNet Services' regulatory obligations.

In its EFA Guideline, the AER states "forecast opex should provide sufficient expenditure to comply with all applicable regulatory obligations or requirements."¹⁴⁵ This is also a requirement of the NER, which stipulate the AER must approve a total opex forecast that reasonably reflects, among other things, the efficient costs of achieving the opex objectives, which include compliance with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services.¹⁴⁶

AusNet Services considers that whether a cost is non-recurrent or recurrent in nature is irrelevant for the purposes of providing for all applicable regulatory obligations in the opex forecast.

Furthermore, not approving the proposed step change would be inconsistent with the precedent set by the AER in recent regulatory reviews. For example, in its recent determination for AusNet Services' electricity distribution network, the AER approved non-recurrent expenditure in 2020 for defining and developing new tariffs as part of the Power of Choice cost reflective pricing rule change.¹⁴⁷

For the reasons set out above, AusNet Services is proposing a step change for the decommissioning costs of the SCOs. The forecast expenditure has been adjusted to remove the operating and maintenance costs that will be avoided with the retirement of the SCOs.¹⁴⁸

¹⁴² AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 68.

¹⁴³ AEMO, Letter to AusNet Services, dated 10 August 2016.

¹⁴⁴ Clause 7 of the Transmission Licence issued to AusNet Services.

¹⁴⁵ AER, *Expenditure Forecast Assessment Guideline: Explanatory Statement*, p. 72.

¹⁴⁶ NER cl. 6A.6.6(a)(2) and 6A.6.6(c)(1).

¹⁴⁷ AER, *AusNet Services distribution determination final decision*, Attachment 7 – Operating expenditure, May 2016, p. 87.

¹⁴⁸ Avoided O&M costs are as per AusNet Services response to AER IR#006. The avoided costs in 2017-18 are higher to reflect a true-up of the O&M avoided in 2016-17 for the Brooklyn Terminal Station synchronous condenser.

Table 4.9: Forecast opex for synchronous condensers (\$m, 2016-17)

Synchronous condenser decommissioning	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Fishermans Bend Terminal Station	1.5	0.0	0.0	0.0	0.0	1.5
Brooklyn Terminal Station	1.4	0.0	0.0	0.0	0.0	1.4
Templestowe Terminal Station	1.5	0.0	0.0	0.0	0.0	1.5
Less: avoided O&M costs	-0.4	-0.3	-0.3	-0.3	-0.3	-1.4
Total	4.0	-0.3	-0.3	-0.3	-0.3	2.9

Source: AusNet Services

Morwell Power Station assets

AusNet Services does not accept the Draft Decision on the decommissioning of Morwell Power Station assets. These costs are the result of the first ever decommissioning of a major connection point to the transmission system.

This step change, which comprises opex of \$1.9 million, was proposed to fund the decommissioning costs of transmission assets located at Morwell Power Station (MPS). The closure of MPS in August 2014 has meant that power is being provided to Energy Brix Australia Corporation's (EBAC) briquette manufacturing facility from Morwell Terminal Station, until the Morwell zone substation is established in 2018 to supply EBAC's load. At this time, AusNet Services' connection assets at MPS will no longer be required. Consequently, AusNet Services proposed expenditure to decommission and make safe the relevant assets, remove them from EBAC's land and restore the site.

The Draft Decision relied upon the same arguments discussed above in relation to SCOs to reject the MPS assets step change. That is, the AER agreed that the proposed expenditure to decommission MPS assets was prudent and efficient, but rejected the step change on the basis that the opex is already provided in the base year.

AusNet Services considers that by rejecting the MPS step change, the AER has determined a total opex forecast that does not reasonably reflect the opex criteria. This is because:

- The AER's assumptions with respect to asset decommissioning being a part of normal operations are incorrect, as these costs have historically formed part of capex, not opex; and
- The decommissioning costs have not been accounted for in the opex forecast because the AER has not presented any robust evidence to demonstrate they will be offset by reductions in other opex categories.

These points are discussed further above in relation to SCOs, and are repeated and relied upon with respect to the MPS assets step change. AusNet Services is, therefore, proposing a step change for the decommissioning costs of MPS assets. The forecast expenditure has been adjusted to remove the operating and maintenance costs that will be avoided with the retirement of MPS transmission assets.¹⁴⁹

¹⁴⁹ Avoided O&M costs are approximately \$2,000 per annum. Most O&M at MPS is associated with distribution assets, rather than transmission assets.

Table 4.10: Forecast opex for Morwell Power Station assets (\$m, 2016-17)

Morwell Power Station decommissioning	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Decommissioning of assets	0.5	0.0	0.0	0.0	0.0	0.5
Removal of assets	0.9	0.0	0.0	0.0	0.0	0.9
Site restoration	0.5	0.0	0.0	0.0	0.0	0.5
Less: avoided O&M costs	0.0	0.0	0.0	0.0	0.0	-0.01
Total	1.9	0.0	0.0	0.0	0.0	1.9

Source: AusNet Services

West Melbourne Terminal Station mobile switchboard

AusNet Services does not accept the Draft Decision on the West Melbourne Terminal Station (WMTS) mobile switchboard step change.

This step change, which comprises opex of \$2 million, was proposed to allow AusNet Services to lease a mobile switchboard to ensure the safe operation and maintenance of WMTS switchroom assets until they are taken out of service.

The Draft Decision relied upon the same arguments discussed above in relation to SCOs to reject the WMTS mobile switchboard step change. That is, the AER agreed that the proposed expenditure to lease the switchboard was prudent and efficient, but rejected the step change on the basis that the opex is already provided in the base year.

AusNet Services considers that by rejecting the WMTS mobile switchboard step change, the AER has determined a total opex forecast that does not reasonably reflect the opex criteria. This is because the AER's assumptions with respect to leasing a mobile switchboard being a part of normal operations are incorrect and as a result, the decommissioning costs have not been accounted for in any element of the opex forecast.

Furthermore, the costs are being driven by a decision to avoid capex and, therefore, are justified as a step change under the AER's EFA Guideline approach.

The costs are driven by a decision to avoid capex

The proposed step change, which requires opex of \$2 million over five years, is a significantly more prudent and efficient solution than the full replacement of the switchroom. The cost of replacing the switchroom, which would provide a long-term solution to address the risks outlined above, is estimated at \$17.2 million.

Hence, failing to include the proposed opex in the total opex forecast is inconsistent with both the AER's EFA Guideline and the NER, which state that in forming a view on whether the opex forecast reasonably reflects the opex criteria, the AER must have regard to the substitution possibilities between operating and capital expenditure.¹⁵⁰

The circumstances surrounding the WMTS rebuild are unique

The Draft Decision stated:

"We consider asset management, whether it is to prolong the life of an asset (refurbishment) or to end the life of an asset is business as usual for a network service provider. Generally, an efficient base level of opex (rolled forward each year with an appropriate rate of change)

¹⁵⁰ NER cl. 6A.6.6 (e)(7).

*is sufficient for a prudent and efficient service provider to manage its assets and in doing so maintain the quality, safety, reliability and security of supply of its network.*¹⁵¹

The AER has incorrectly assumed the circumstances around leasing a mobile switchboard are reflective of normal operations. AusNet Services has determined that it is currently economic to replace the WMTS 22kV switchroom based on the safety and supply risk presented by an asset failure. However, due to CitiPower's plans to retire its 22kV network, this is not a prudent and efficient solution, creating a significant safety risk until the 22kV WMTS assets are taken out of service.

These circumstances are not reflective of a typical station rebuild, which normally involve the replacement of all assets that are in a deteriorated condition and, hence, would not require a mobile switchboard solution to manage the short-term risks of failure. In fact, this is the first time AusNet Services has been required to lease a mobile switchboard.

Therefore, it is unreasonable to assume that the historical costs used to forecast opex are sufficient to account for the WMTS mobile switchboard costs.

The costs have not been accounted for in the AER's opex forecast

As discussed above in relation to SCOs, the mobile switchboard costs have not been accounted for in the opex forecast because the AER has not presented any robust evidence to demonstrate they will be offset by reductions in other opex categories.

AusNet Services agrees with the AER that individual categories of expenditure will move from year to year, as will total opex. This fact alone is not evidence that AusNet Services' will be able to make reductions in some opex categories in 2017-18 such that it can absorb \$2 million to lease a mobile switchboard, as the AER has assumed when rejecting the proposed step change.

The AER has, therefore, determined a total opex forecast that does not reasonably reflect the opex criteria.

For the above reasons, AusNet Services considers the WMTS mobile switchboard step change is consistent with a total opex forecast that reasonably reflects the opex criteria. AusNet Services is therefore proposing a step change for the WMTS mobile switchboard.

Table 4.11: Forecast opex for WMTS mobile switchboard (\$m, 2016-17)

WMTS mobile switchboard	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Switchboard lease and transport costs	0.26	0.25	0.25	0.25	0.00	1.00
Overhaul	0.00	0.05	0.00	0.00	0.05	0.10
Cabling	0.45	0.00	0.02	0.45	0.00	0.92
Total	0.71	0.30	0.27	0.70	0.05	2.02

Source: AusNet Services

4.6.3 Revised Proposal

AusNet Services' revised step change opex for the current regulatory period is \$11 million. Step changes account for 1% of the total opex forecast.

¹⁵¹ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 69.

Table 4.12: Total forecast step change opex (\$m, real 2016-17)

Step change	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Establishment of IT security team	0.7	0.7	0.7	0.7	0.7	3.3
SAIP roll out	0.3	0.3	0.1	0.1	0.1	0.9
Synchronous condensers	4.0	-0.3	-0.3	-0.3	-0.3	2.9
Morwell Power Station assets	1.9	0.0	0.0	0.0	0.0	1.9
WMTS mobile switchboard	0.7	0.3	0.3	0.7	0.1	2.0
Total	7.6	1.0	0.7	1.2	0.5	11.0

Source: AusNet Services

4.7 Self-Insurance

AusNet Services does not accept the AER's approach to forecasting self-insurance costs as part of base year opex, and proposes to forecast these costs on a category-specific basis.

4.7.1 Draft Decision

The Draft Decision rejected AusNet Services' proposed approach of forecasting its self-insurance costs for the current period, which involved:

- Removing 2014-15 self-insurance costs (being the self-insurance allowance approved for the current regulatory period) from base year opex; and
- Including a category-specific forecast of self-insurance costs in the opex forecast, based on actuarial modelling carried out by Aon.
- The AER did not include the self-insurance allowance approved for the current period in the base year, which is included in reported opex through a regulatory adjustment.¹⁵² Instead, the AER forecast self-insurance costs by leaving 2014-15 self-insurance losses in the base year and excluding AusNet Services' category-specific forecast from its opex forecast.
- The AER stated:

*"We have not included a category specific forecast for insurance or self-insurance in our total opex forecast. Instead we have left insurance and self-insurance costs in the base year and applied a revealed cost forecasting approach."*¹⁵³

The AER also stated:

"The NER requires us to form a view on total opex, rather than on components such as self-insurance. Consequently, we make our assessment about the total forecast opex amount and not about particular categories or projects in the opex forecast. Within total opex we would expect some variation in the composition of expenditure from year to year. That is, expenditure for some categories would be higher than usual in a given year while other categories would be lower than usual. However, these variations are expected to offset each other so that total opex is relatively stable. This expectation is consistent with AusNet Services' past opex which has been relatively stable since 2010–11 (see Figure 7.1). We would generally expect that a prudent and efficient service provider would reallocate resources between different projects and between different categories in response to its changing business needs. In this context, using a category specific forecasting method may

¹⁵² This adjustment, which remove actual self-insurance losses from opex and add the self-insurance provision, is explained in worksheet 'PTS Adj' of the 2014-15 Regulatory Accounts.

¹⁵³ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 33.

produce a better forecast of expenditure for a particular category but we do not consider it produces a better forecast of total opex.”¹⁵⁴

4.7.2 Response to Draft Decision

AusNet Services does not accept the AER’s approach to forecasting its self-insurance costs for the forthcoming regulatory period.

The Revenue Proposal’s self-insurance forecast was determined using the same methodology approved by the AER for the current transmission determination, where it approved a self-insurance allowance of \$1.7 million per annum (real 2016-17).

By forecasting self-insurance using the losses in the base year – approximately \$0.9 million – the AER has produced a total forecast of opex that does not reasonably reflect the opex criteria. This is because the AER has:

- Inconsistently treated self-insurance and insurance;
- Failed to recognise the impact of self-insurance losses on total opex;
- Not accounted for up to date information on self-insurance costs; and
- Inconsistently treated self-insurance in the opex forecast and the EBSS calculation.

Each of these issues is discussed further below.

Consistent treatment of self-insurance and insurance

The Draft Decision reflects a misunderstanding of the mechanics and purpose of self-insurance. Self-insurance losses are by nature volatile and can vary markedly from year to year.

For this reason, the quantification of these losses is best suited to an actuarial analysis that forecasts self-insurance based on expected losses determined from historical data, rather than on actual losses in a single year. The AER’s approach will not result in a more accurate forecast of total opex than such an analysis, particularly when base year opex is materially influenced by losses due to abnormal events.

Indeed, self-insurance is analogous to insurance, with the “premium” being an actuarial assessed self-insurance allowance, and the costs of actual self-insured events being equivalent to insurance losses that are claimed under an insurance policy. Therefore, just like for insurance, the relevant cost in the base year to be assessed is the allowance, or premium, not the self-insurance losses incurred.

Given either insurance or self-insurance, or a combination of both, can be used to manage a given risk class (e.g. bushfire liability), the costs of both risk management options should be assessed on a consistent basis. The Draft Decision on self-insurance is analogous to the inclusion of the amount paid out on insurance settlements in the opex allowance, rather than the insurance premium.

By accepting that insurance premiums are a cost that should be allowed for in opex forecasts, but not adopting the same position on self-insurance, the Draft Decision provides a perverse incentive to rely solely on insurance, rather than self-insurance, to manage insurable risks. This has the potential to result in an inefficient level of insurance coverage being obtained.

For example, the AER’s approach incentivises AusNet Services to minimise its exposure to tower failure risk by taking out insurance on its towers and conductors. This would result in inefficient insurance costs that would ultimately be funded by customers, thereby running counter to the NEO. A consistent approach to both insurance and self-insurance provides balanced incentives to TNSPs with respect to the risk management measures they choose to

¹⁵⁴ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 35.

employ, and is more likely to minimise the total cost of insurable risk than an approach that asymmetrically encourages insurance or self-insurance. This promotes the long-term interests of customers through lower opex allowances. In addition, in the unlikely event that an incident occurred that eroded all of AusNet Services' insurance cover, the AER may be placed in the position of being asked to approve a pass-through of excess costs to customers. It is implicit in this feature that an NSP must prudently and efficiently manage its exposure to the risk of liabilities, commensurate with the size and nature of its operations. A necessary component of this is self-insurance.

The Draft Decision is also at odds with the regulatory accounting treatment mandated in the transmission sector, where self-insurance payments are held in a provision that is then drawn down for events (losses). The AER's submission guidelines for TNSPs state the following:

"E. The annual regulatory accounts must record the cost of self-insurance as an operating expense and establish a self-insurance reserve

*F. When a claim against self-insurance is made, an appropriate deduction to the self-insurance reserve must be recorded."*¹⁵⁵

Accordingly, the Draft Decision is not consistent with the long-established practices the AER has required AusNet Services to comply with in relation to the treatment and reporting of self-insurance costs.

The impact of self-insurance losses on opex

The AER rejected the category-specific self-insurance forecast because it considered that a revealed cost approach is consistent with the NER requirements for it to determine a total opex forecast, which do not require it to "consider exactly how AusNet Services will allocate opex to programs and projects in the next regulatory control period".¹⁵⁶ This implies that AusNet Services has control over the self-insurance losses it incurs, which it clearly does not given the uncontrollable nature of self-insurance events (e.g. bushfires, storms, etc).

While the AER has stated that categories of expenditure vary from year to year and that these variations tend to offset each other, it has not presented evidence that this is the case with respect to AusNet Services' self-insurance costs. In fact, self-insurance is quite deliberately aimed at infrequent high cost events, therefore, the likelihood that the base year or even an average over one regulatory period would be reflective of annual self-insurance premiums set through an actuarial approach is unlikely.

AusNet Services acknowledges that the composition of its opex will vary from year to year and there may be some offsetting effects of this variation. However, whether these offsetting effects mean that total opex is broadly recurrent from year to year depends on the quantum of individual expenditure categories. Where an individual opex category has a high degree of volatility and may be significant from time to time, relying on offsetting effects between categories is unlikely to result in the best forecast of total opex.

Furthermore, if AusNet Services had incurred large self-insurance costs in 2014-15 (the base year for the forthcoming period), its opex forecast for the current period would be materially higher under the AER's self-insurance approach. Because self-insurance losses are excluded from the EBSS for the current period, this would have resulted in a windfall gain for AusNet Services and higher prices for customers.

This potential outcome highlights the shortcomings of forecasting self-insurance opex based on the amount incurred in a single year.

¹⁵⁵ AER, *Electricity transmission network service providers, submission guidelines: Final*, September 2007, pp. 20-21.

¹⁵⁶ AER, *AusNet Services Draft Decision*, Attachment 7 – Operating expenditure, July 2016, p. 36.

However, self-insurance costs in 2014-15 were \$0.9 million, compared with Aon’s annual self-insurance forecast of \$2.7 million, which AusNet Services proposed in its Revenue Proposal. Accordingly, the AER appears to have forecast AusNet Services’ self-insurance costs based on its actual 2014-15 losses because these costs were not significant in that year, rather than based on a robust actuarial analysis.

Because of the intrinsic volatility of self-insurance costs, and their potential significance to total opex, an actuarial approach to forecasting these costs based on their expected value will result in a total opex forecast that meets the opex criteria, compared to an approach that forecasts using a single year of losses.

Finally, the AER has stated that by including self-insurance in the EBSS for the forthcoming period, self-insurance losses will be shared with consumers, including those occurring in the base year. While this point is true, the fact that self-insurance losses not accounted for in the opex forecast will be shared with customers through the EBSS does not absolve the AER of its obligation to approve a total opex forecast that is sufficient to meet the opex objectives.

Up to date information on self-insurance costs

The Revenue Proposal self-insurance forecast of \$13.5 million was based on Aon’s expert actuarial assessment of expected self-insurance costs over the forthcoming period. The AER approved this approach to forecasting self-insurance in its current transmission determination.

The annual self-insurance allowances approved for the current period, and those being proposed for the forthcoming period, are shown in the Table below.

Table 4.13: Annual self-insurance allowance, by risk class (\$m, real 2016-17)

Risk class	2014-17 final decision	2017-22 forecast
Tower failure	0.3	1.1
Machinery breakdown	0.8	0.7
Property damage	0.5	0.4
Fire liability	0.1	0.1
Risk margin	0.0	0.4
Total	1.7	2.7

Source: AusNet Services’ Revenue Proposal; AER final decision for 2014-17 regulatory control period, Part 3 – confidential appendices, p. 7.

With the exception of tower failure and risk margin (which the AER did not approve at the last reset), the proposed self-insurance allowances are similar to those approved for the current period. The increased tower failure forecast reflects:

- The latest available information on the costs associated with a tower failure, based on the costs incurred when five towers collapsed in November 2014 during a severe storm; and
- The correction of an error in the 2014-17 analysis that resulted in only some tower failure costs being included in the risk quantification.

This is explained in Aon’s report as follows:

“For the current reset period (2014 – 2017), the tower failure self-insurance analysis performed in 2013 utilised an average tower cost of \$350K (2013 values). In obtaining updated information for this analysis, it was determined that the previous tower cost estimates were misstated as ‘replacement cost’, which in fact only catered for the recovery cost of a tower and did not include the replacement cost of a tower (recovery costs representing the cost relating to labour and equipment required to reinstate the line back into

service, traffic management and site security during construction, survey and inspection of conductor and site works to keep the area safe).

Consequently, in this analysis, the average cost of a tower (\$874k, which is made up of \$746k replacement cost and \$128k recovery cost, in 2015 values) includes both the estimated replacement cost of a tower and associated recovery cost.¹⁵⁷

As discussed in section 4.3 in relation to productivity, the AER has expressed a preference for using up to date information where possible:

“We have indicated in previous decisions and in defending those decisions our preference to use up to date information where possible. The Tribunal has endorsed this approach and indicated a similar preference.”¹⁵⁸

The self-insurance forecast being proposed is based on the best available information on self-insurance costs obtained from recent events. Consequently, it reflects the most accurate assessment of AusNet Services’ self-insurance costs for the forthcoming period.

Self-insurance in the opex forecast and the EBSS calculation

AusNet Services notes that the opex amounts in the AER’s EBSS model relate to the self-insurance allowance approved for the current period, rather than self-insurance losses. Accordingly, the AER has treated self-insurance costs correctly in its EBSS decision. AusNet Services considers this correct treatment should also be applied to the opex forecast to ensure consistency between the various building blocks of the AER’s decision.

AusNet Services’ proposed EBSS carryover amount is discussed in Chapter 8: Incentive Schemes.

4.7.3 Revised Proposal

For the reasons set out above, AusNet Services considers the proposed self-insurance forecast is required to form a total opex forecast that reasonably reflects the opex criteria.

AusNet Services is, therefore, proposing a self-insurance forecast of \$13.5 million, based on the Aon forecast submitted in its Revenue Proposal. Self-insurance costs account for 1.3% of the total opex forecast.

Table 4.14: Forecast self-insurance costs (\$m, real 2015)

Risk class	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Tower failure	1.1	1.1	1.1	1.1	1.1	5.5
Machinery breakdown	0.7	0.7	0.7	0.7	0.7	3.6
Property damage	0.4	0.4	0.4	0.4	0.4	2.0
Fire liability	0.1	0.1	0.1	0.1	0.1	0.3
Risk margin	0.4	0.4	0.4	0.4	0.4	2.1
Total	2.7	2.7	2.7	2.7	2.7	13.5

Source: AusNet Services

4.8 Easement Land Tax

AusNet Services accepts the Draft Decision on easement land tax.

¹⁵⁷ Aon, *Self-Insurance Risk Quantification – AusNet Transmission Group*, October 2015, p. 16.

¹⁵⁸ AER, *Ergon Energy preliminary determination 2015–20 | Attachment 7 – Operating expenditure*, April 2015, p. 85.

4.8.1 Draft Decision

AusNet Services proposed an easement land tax forecast of \$576.4 million for the forthcoming period, based on the tax assessment notice received for 2015-16.

The AER accepted this as a reasonable basis for forecasting, but approved a forecast of \$571.6 million due to a different approach to escalating to real 2016-17 dollars.

4.8.2 Response to Draft Decision

AusNet Services accepts the Draft Decision on easement land tax. Where the actual tax paid in the forthcoming period materially differs from the allowance provided as part of the revenue determination, AusNet Services can apply for a pass through.

4.8.3 Revised Proposal

Table 4.15: Forecast easement land tax (\$m, real 2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Easement land tax	114.3	114.3	114.3	114.3	114.3	571.6

Source: AusNet Services

4.9 Total Opex Forecast

The Table below shows AusNet Services' total forecast operating expenditure for the current period of \$1,057.6 million.

Table 4.16: Forecast total opex (\$m, real 2016-17)

Component	2017-18	2018-19	2019-20	2020-21	2021-22	Total	
						\$	%
Base opex	87.0	87.0	87.0	87.0	87.0	434.9	41.1%
Real price change	0.3	0.9	1.6	2.3	3.0	8.2	0.8%
Productivity	0.0	0.0	0.0	0.0	0.0	0.0	0.0%
Group 3 assets	2.1	2.1	2.1	2.1	2.1	10.4	1.0%
Step changes	7.6	1.0	0.7	1.2	0.5	11.0	1.0%
Self-insurance	2.7	2.7	2.7	2.7	2.7	13.5	1.3%
Easement land tax	114.3	114.3	114.3	114.3	114.3	571.6	54.0%
Debt raising costs	1.6	1.6	1.6	1.6	1.6	8.0	0.8%
Total	215.6	209.7	210.0	211.1	211.2	1057.6	100.0%

Source: AusNet Services

4.10 Supporting Documents

The following Appendices are provided to support this Chapter:

- Appendix 4A – CIE Labour Forecasts.
- Appendix 4B – Analysis of Ukrainian cyber-attacks.
- Appendix 4C – SAIP NPV analysis.
- Appendix 4D – AEMO letter to AusNet Services re retirement of SCOs.

Technical supporting document Actual, Estimated and Forecast Expenditure contains a breakdown of operating expenditure for the current and forecast regulatory control period.

5 Depreciation

This chapter sets out AusNet Services' response to the Australian Energy Regulator's (AER's) Draft Decision with respect to depreciation as set out in Attachment 5 of the Draft Decision. AusNet Services' initial positions were set out in Chapter 9 of the Revenue Proposal.

In the event of inconsistency between information contained in this chapter and AusNet Services' Revenue Proposal, the information contained in this chapter prevails.

5.1 Key Points

- AusNet Services is forecasting total depreciation costs of \$624.2 million (nominal) for the forthcoming regulatory control period.
- In line with the Draft Decision, AusNet Services is no longer proposing to apply diminishing value (DV) depreciation to new assets installed from 1 April 2017.
- AusNet Services proposes to continue to apply straight-line depreciation to its existing asset base and assets to be commissioned in the 2017-22 regulatory period.
- AusNet Services accepts the AER's decision to accelerate the depreciation of assets that are to be decommissioned in the current or forthcoming regulatory period.
- AusNet Services proposes accelerated depreciation to other selected network assets that are no longer expected to be required in the medium-term (i.e. 5-10 years) due to changes in Victoria's generation mix.
- The proposed approach:
 - Results in a depreciation schedule that reflects the nature of the assets over the economic life because it aligns the recovery of the value of these assets with the time period during which they are expected to provide services; and
 - Ensures the depreciation of these assets does not distort future price levels.
- AusNet Services agrees with the AER that under the current regulatory framework it will recover the full cost of assets that may have become stranded, and notes that the "regulatory compact" referred to in the Draft Decision benefits consumers through a lower rate of return than what would otherwise apply and, therefore, lower prices.

5.2 Summary

5.2.1 Draft Decision

The AER's Draft Decision approved \$521.3 million of regulatory depreciation (nominal) for the 2017-22 regulatory control period, a reduction of 13.5% compared to AusNet Services' proposed depreciation allowance of \$602.8 million.

The key driver of the \$81.4 million reduction was the AER's rejection of AusNet Services' application of DV depreciation to assets installed from 1 April 2017 because it considered this approach did not reflect the nature of these assets over their economic lives.

AusNet Services' Revenue Proposal:

- Applied straight line (SL) depreciation to assets in the existing RAB using the year-by-year tracking approach;
- Applied DV depreciation to new assets installed from 1 April 2017; and

- Accelerated the depreciation of assets that will be decommissioned in the current or forthcoming period by fully depreciating their remaining values over the forthcoming period.

The Draft Decision accepted the year-by-year tracking approach to calculating SL depreciation and the associated standard lives. The Draft Decision also accepted the full depreciation of assets that will be decommissioned in the current or forthcoming period, reflecting this approach in the Tax Asset Base in addition to the Regulated Asset Base. While the AER considered that an asset unused for some time may be utilised in the future, it accepted AusNet Services' approach, noting AEMO's advice that the relevant assets are not required and may be retired.¹⁵⁹ The AER described AusNet Services' approach of fully depreciating these assets as follows:

*"This is a targeted approach to dealing with the issue that some assets may no longer be utilised. We consider it is reasonable that such assets, which have not been fully depreciated and therefore have a remaining value, be subject to accelerated depreciation reflecting its reduced economic life. We therefore accept this aspect of AusNet Service's proposal in principle."*¹⁶⁰

While the Energy Users Coalition of Victoria did not support AusNet Services' proposal and considered that businesses should bear the cost of asset stranding, the AER considered the NER do not allow for this, stating:

*"..., we consider it reasonable to depreciate assets that have been removed from service relatively quickly so they don't impact revenues and distort prices well into the future. Such an approach also leads to a depreciation profile consistent with the nature of the assets no longer being used, as required by the NER."*¹⁶¹

The AER recognised AusNet Services is not exposed to financial stranding risk under the current regulatory framework.¹⁶² The AER was of the view that the NER provide for the recovery of a prudently acquired asset's value regardless of its utilisation, recognising that this provides the certainty required for NSPs to make large sunk investments:

*"However, we do not consider the NER allows such uncompensated adjustments to the RAB. We agree with the EUCV's statement that the regulatory framework allows service providers certain benefits that may not be available in competitive markets such as being allowed a return on assets that may only be partially utilised. However, such benefits are a trade-off so that service providers are willing to make large sunk investments in the first place. That is, such benefits are part of the 'regulatory compact' as some economists have labelled it."*¹⁶³

5.2.2 Revised Revenue Proposal

AusNet Services has reconsidered its approach to accelerated depreciation. In summary, AusNet Services is proposing to:

- Accelerate depreciation of assets that:
 - Will be decommissioned in the current or forthcoming period, as approved by the AER;
 - Are expected to no longer be required in the medium-term (i.e. 5-10 years) due to changes in Victoria's generation mix, where this is consistent with the requirements of the NER.¹⁶⁴

¹⁵⁹ AER, *AusNet Services Draft Decision*, Attachment 5 – Regulatory depreciation, July 2016, p. 32.

¹⁶⁰ AER, *AusNet Services Draft Decision*, Attachment 5 – Regulatory depreciation, July 2016, p. 32.

¹⁶¹ AER, *AusNet Services Draft Decision*, Attachment 5 – Regulatory depreciation, July 2016, p. 32.

¹⁶² AER, *AusNet Services Draft Decision*, Attachment 5 – Regulatory depreciation, July 2016, p. 22.

¹⁶³ AER, *AusNet Services Draft Decision*, Attachment 5 – Regulatory depreciation, July 2016, p. 22.

¹⁶⁴ Note that NER clause 6A.6.3(c) prevents accelerated depreciation for assets serving a specific customer or customer group with a RAB value exceeding \$20 million.

- Apply SL depreciation to all other assets using the year-by-year tracking approach.

AusNet Services is no longer proposing to apply DV depreciation to new assets installed from 1 April 2017.

Having regard to the above changes, AusNet Services forecasts depreciation of \$624.2 million (nominal) for the forthcoming regulatory period. On a like-for-like basis (i.e. removing the impact of the Revenue Proposal's higher inflation forecast), this is a \$77 million, or 11% reduction on the Revenue Proposal.

AusNet Services agrees with the AER that under the current regulatory framework it will recover the full cost of assets that have or will become stranded, and notes that the “regulatory compact” referred to in the Draft Decision benefits consumers through a lower rate of return than what would otherwise apply and, therefore, lower prices.

The remainder of this chapter is structured as follows:

- Section 5.3 sets out the considerations that have shaped the Revised Revenue Proposal for depreciation;
- Section 5.4 provides an overview of the proposed depreciation approach;
- Section 5.5 discusses the accelerated depreciation being proposed; and
- Section 5.6 lists the supporting documents that are relevant to this Chapter.

The information set out in this chapter accords with all the applicable requirements of the National Electricity Rules (NER).

5.3 Considerations shaping the Revised Revenue Proposal for Depreciation

The NER states that the depreciation schedules used to determine the annual depreciation allowance must depreciate the value of the asset ‘using a profile that reflects the nature of the assets or category of assets over the economic life of that asset or category of assets’.¹⁶⁵

The depreciation allowance included in this Revised Revenue Proposal reflects consideration of the appropriate timing of the return of investment in the transmission network over the life of the assets.

In principle, if an asset will continue to provide an effective service for 50 years into the future it is important that future generations contribute to the cost of the initial investment. Conversely, future customers should not pay for assets that have been retired and no longer provide a service, as they will not receive the benefits of that service.

This principle, which underpinned the Revenue Proposal's accelerated depreciation of assets that will be decommissioned in the current or forthcoming regulatory periods, has also guided the development of the Revised Revenue Proposal's depreciation forecast.

Box 5.1: Response to stakeholder feedback on the uptake of disruptive technologies

Some stakeholders expressed concern that accelerated depreciation may have the unintended consequence of encouraging consumers to invest in disruptive technology sooner rather than later

AusNet Services considers that any short-term price increases would not reduce utilisation because disruptive technologies are currently not economic compared to the grid alternative. This period was described as a “window of opportunity” in theoretical research

¹⁶⁵ NER cl. 6A.6.3(b)(1).

conducted on the implications of competition and technological change for economic depreciation for a regulated firm.¹⁶⁶

This research found that regulators are averse to taking action during such a period, and that this is inappropriate given the nature and rate of technological change. Also known as 'regulatory lag,' this concept of regulation failing to keep speed with industry change is not new.

Accordingly, AusNet Services considers the Revenue Proposal's accelerated depreciation proposal was timely, having regard to the current economics of disruptive technologies.

However, AusNet Services is no longer proposing to accelerate the depreciation of new assets as the level of confidence or certainty required by the AER cannot be provided in the current environment.

While the Draft Decision did not approve the adoption of DV depreciation of new assets installed from 1 April 2017, AusNet Services maintains that this approach has economic efficiency and intergenerational equity benefits. The AER has set a high threshold for the evidence it requires before approving accelerated depreciation based on declining future utilisation. The AER stated:

*"Given depreciation is a blunt instrument great confidence in the size and direction of any expected trends would be needed before a particular depreciation profile adopted."*¹⁶⁷

And:

*"We would require a high level of certainty on the size and direction of expected utilisation trends across all assets before such a change could be justified."*¹⁶⁸

AusNet Services does not consider this level of confidence or certainty can be provided in the current environment and, therefore, is no longer proposing to accelerate the depreciation of new assets. This also aligns with the strong stakeholder feedback received opposing the initial proposal's form of accelerated depreciation.

However, AusNet Services has identified a number of assets that are expected to no longer be required in the medium-term due to changes in Victoria's generation mix. It is, therefore, proposing to reduce the remaining lives applying to these assets.

This approach results in a depreciation schedule that reflects the nature of the assets over their economic life and aligns the recovery of the value of these assets with the time period during which they are expected to provide services. This also ensures the depreciation of these assets does not distort future price levels and avoids future price shocks that may arise due to the value of the assets being recovered in a condensed timeframe in the case of a sudden reduction in their use. Such an approach is a clear reflection of the NEO and the revenue and pricing principles of the NER.

As discussed in section 5.2.1, the AER has accepted this approach in relation to assets that will be decommissioned in the current or forthcoming period:

*"Against this backdrop, we consider it reasonable to depreciate assets that have been removed from service relatively quickly so they don't impact revenues and distort prices well into the future. Such an approach also leads to a depreciation profile consistent with the nature of the assets no longer being used, as required by the NER."*¹⁶⁹

¹⁶⁶ M Crew and P Kleindorfer, *Economic depreciation and the regulated firm under competition and technological change*, Journal of regulatory economics, Vol. 4, Iss. 1, March 1992, pp. 51–61.

¹⁶⁷ AER, *AusNet Services Draft Decision*, Attachment 5 – Regulatory depreciation, July 2016, p. 53.

¹⁶⁸ AER, *AusNet Services Draft Decision*, Attachment 5 – Regulatory depreciation, July 2016, p. 28.

¹⁶⁹ AER, *AusNet Services Draft Decision*, Attachment 5 – Regulatory depreciation, July 2016, p. 32.

This approach also aligns with the views of some of the stakeholders AusNet Services consulted in developing its Revenue Proposal. While stakeholders were critical of applying accelerated depreciation to all new assets, some suggested that targeting existing assets that were most likely not to be required in future (such as Latrobe Valley assets) was most appropriate. Some stakeholders suggested that AusNet Services requires more reliable, locational specific data to underpin its depreciation proposal to more accurately match the expected level of future service provided by the asset and the depreciation profile applied to it.

AusNet Services considers the Revised Revenue Proposal's approach aligns with these views because it is targeted to those assets that are least likely to be required in the future, and is based on a credible assessment of the future utilisation of these assets.

AusNet Services is also proposing accelerated depreciation of specific assets as this approach has strong economic merits. It will result in future customers paying only for those assets that are providing services to them and hence, face more efficient price signals. It also complies with the regulatory framework, which requires the forecast depreciation schedules to reflect the nature of the assets over their economic lives.

The reasons for AusNet Services' revised accelerated depreciation proposal are discussed further in section 5.5.

Box 5.2: Response to stakeholder feedback on the future role of the Victorian transmission network

Stakeholders were interested in AusNet Services' views on the future role of the Victorian transmission network

Some stakeholders considered the Revenue Proposal's accelerated depreciation proposal did not clearly define the future role of the Victorian transmission network. They considered this was an important issue to have regard to when presenting the case for accelerated depreciation.

AusNet Services considers that the depreciation profiles applied to its asset base should align with the future role of that asset base. Accordingly, this section sets out AusNet Services' high level views on the future role and use of the Victorian transmission network, taking account of views expressed by the network planner, AEMO, and AusNet Services' own position as the network owner and operator.

While the transmission network will remain highly relevant into the long-term, the nature of its use will evolve to reflect two key needs of the Victorian community:

- Continued provision of reliable, secure and stable supply to customers; and
- Reduced greenhouse gas emissions via efficient transmission of large scale renewable energy.

The first point reflects the fact that the core role of the network – the provision of prescribed transmission services – will continue to be required over the long-term. As outlined in its Revenue Proposal, AusNet Services considers there is uncertainty regarding future utilisation trends, including due to location-specific changes in asset utilisation, as well as broader changes in energy consumption as a result of disruptive technologies (e.g. solar and battery technology). However, these changes are not expected to result in the transmission network overall no longer being required.

The second point reflects the significant changes in Victoria's generation mix that are expected over the coming decade as a result of:

- Increased renewable generation in order to meet Australian and Victorian energy policies, including Victoria's Renewable Energy target of 40% renewable generation by 2025; and
- A reduction in brown coal fired generation due a range of factors, including:

- Renewable energy policies; and
- Decisions by asset owners to divest or shutdown brown coal generation assets.

These two trends will result in substantial changes in the utilisation of different segments of the transmission network.

Firstly, the transmission lines connecting the Latrobe Valley to Melbourne will experience reductions in utilisation as a result of decreased reliance on brown coal generation.

Secondly, the connection of further renewable energy generation into the transmission network will increase the utilisation of this part of the network, and likely require major augmentation.

While the network currently allows access to renewable generation, including wind energy from South Australia and hydro generation from Tasmania, AusNet Services understands there is significant amount of proposed renewable generation in Victoria, particularly in the north-west region.

For this reason, AEMO will commence a Regulatory Investment Test for Transmission (RIT-T) for augmentation in North West Victoria later this year. AEMO has indicated that the market benefits of connecting more than 400 MW in this area could justify major augmentation of the transmission network.

AusNet Services, therefore, considers that the Victorian transmission network will remain relevant long into the future, but will be subject to material changes in use as the state's generation mix and consumption patterns evolve.

5.4 Proposed Depreciation Approach

AusNet Services adopts the Draft Decision in relation to DV depreciation. AusNet Services has reconsidered its approach to accelerated depreciation and is proposing to:

- Accelerate depreciation of assets that:
 - Will be decommissioned in the current or forthcoming period, as approved by the AER; and
 - Are expected to no longer be required in the medium-term due to changes in Victoria's generation mix.
- Apply SL depreciation to all other assets using the year-by-year tracking approach.

The depreciation methodology proposed to apply to each of these asset groups is discussed further below.

A number of the conclusions in the Draft Decision in relation to the DV approach are also explored in Attachment 5A, particularly where they are not supported by evidence or are based on a misinterpretation of information.

These comments have been provided to ensure there continues to be robust debate on the economic merits on the use of accelerated depreciation as a response to expected changes in the energy landscape.

Assets that will be decommissioned in the current or forthcoming period

AusNet Services accepts the AER's decision to fully depreciate the value of:

- Transmission assets at Morwell Power Station (MPS) that will be decommissioned due to the closure of MPS; and
- Synchronous condensers (SCOs) at the Fishermans Bend (FBTS), Brooklyn (BLTS) and Templestowe Terminal Stations (TSTS) that AusNet Services is proposing to retire.

AusNet Services also accepts the AER’s method of correcting the double counting of depreciation which had inadvertently occurred in its Revenue Proposal.

For the reasons set out in the Revenue Proposal, the full depreciation of these assets over the forthcoming period conforms to the requirement of the NER.

Assets expected to no longer be required

As discussed in section 5.3, AusNet Services has identified a number of additional assets that are expected to no longer be required in the medium-term due to changes in Victoria’s generation mix. These assets are connection assets located at Yallourn Power Station (YPS) and Hazelwood Power Station (HWPS).

AusNet Services is proposing to reduce the remaining lives of the YPS connection assets for the purposes of calculating an appropriate regulatory depreciation allowance.

Assets at HWPS are valued at more than \$20 million and, therefore, are depreciated on a straight-line basis in accordance with the requirements of the NER clause 6A.6.3(c).

While the value of connection assets at the other Latrobe Valley brown generators – Loy Yang A and B – has been calculated at less than \$20 million, AusNet Services is not proposing to accelerate the depreciation of these assets because the currently available information does not provide sufficient certainty around the future of these assets. However, AusNet Services considers this issue should be revisited at the next transmission determination.

AusNet Services also expects that the 500kV double circuit lines connecting Heywood Terminal Station to Alcoa’s Portland Smelter will no longer be required over the forthcoming period, due to the likely closure of the smelter. However, again because their value also exceeds \$20 million, AusNet Services does not propose to accelerate depreciation of these assets. AusNet Services understands a number of prospective wind generation projects are also considering this line as a potential connection point to the Victorian transmission network.

The opening asset classes, opening RAB values and proposed remaining lives of AusNet Services’ connection assets at YPS are set out in the Table below.

Table 5.1: YPS connection assets (\$m, real 2016-17)

Asset class	Opening RAB value	Proposed remaining life
Switchgear	7.5	8
Secondary	5.3	8
Total / Average	12.8	8

Source: AusNet Services

The opening RAB values for these assets have been calculated by:

1. Escalating the depreciated value of assets established in 1994 to March 2017 dollars;
2. Calculating the depreciated value of these assets as at 1 April 2017 using the remaining lives based on the relevant service dates and standard economic lives; and
3. Depreciating capex incurred since 1994 using standard economic lives.

The inputs and calculations used to derive the opening RAB values have been provided as an attachment to this proposal (Attachment 5B).

The proposed remaining lives reflect an assessment by AusNet Services of the likely period during which the assets will provide transmission services and, therefore, the period during which the remaining asset values should be recovered. The details of this assessment, including the justification for the remaining lives shown above, are discussed in section 5.5.

Box 5.3: Response to stakeholder feedback on consumption forecasts and accelerated depreciation**Stakeholders were generally of the view that the choice of depreciation framework should be informed by accurate consumption forecasts**

AusNet Services considers that forecasts of consumption and/or asset utilisation are key inputs to any accelerated depreciation proposal. However, due to the the potential impact of disruptive technologies over the long lives of most transmission assets, a high level of confidence cannot always be attached to long-term forecasts.

This is demonstrated by successive AEMO forecasts, which have continued to present lower forecasts of Victorian energy throughput as new information comes to light, with the latest forecasting showing flat consumption out to 2035.¹⁷⁰

The Draft Decision has set a high threshold for the evidence the AER's requires before approving accelerated depreciation based on declining future utilisation. The current body of evidence is not sufficiently developed, given the fast pace of change over the last few years, nor specific to AusNet Services' transmission network, to meet this threshold.

Instead, AusNet Services' Revised Proposal's accelerated depreciation proposal is specific to parts of the network where a higher degree of confidence with respect to future utilisation can be obtained.

All other assets

AusNet Services accepts the Draft Decision with respect to the year-by-year tracking methodology and associated standard lives.

AusNet Services also accepts the AER's adjustment to true up the asset values between the RFM opening RAB and the depreciated values calculated under the year-by-year tracking approach.

Forecast depreciation

Based on the depreciation methodology described above for each asset group, AusNet Services' total forecast depreciation for the forthcoming regulatory control period is \$627 million (nominal). Depreciation amounts for each asset group are presented in the Table below.

Table 5.2: Revised Proposal forecast depreciation (\$m, nominal)

Asset group	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Decommissioned assets	2.2	2.2	2.3	2.4	2.5	11.6
YPS connection assets	1.4	1.5	1.5	1.6	1.6	7.6
All other assets	117.2	119.3	126.4	129.6	112.6	605.1
Total	120.8	123.0	130.3	133.5	116.7	624.2

Source: AusNet Services

5.5 Assets expected to no longer be required

AusNet Services is proposing to reduce the remaining lives applying to connection assets located at YPS.

¹⁷⁰ AEMO, 2016 National Electricity Forecasting Report, June 2016.

This section sets out AusNet Services' assessment of the likely period during which the assets will provide transmission services and, therefore, the period during which the remaining asset values should be recovered.

5.5.1 YPS connection assets

Located in the Latrobe Valley, YPS is a base-load brown coal generator consisting of four units with a capacity of around 1,480 MW. YPS, which provides around 22% of Victoria's electricity needs, was commissioned throughout the 1970's and early 1980's.¹⁷¹

AusNet Services owns and maintains assets (e.g. transformers, circuit breakers, protection and control equipment) that connect YPS to the Victorian transmission network.

These assets, which are known as connection assets, were included in the RAB that was established for the Victorian electricity system when it was privatised in the early 1990s and, therefore, have been funded by Victorian electricity consumers. If these assets were built today, under the current NER, they would be funded by the power stations.

Because these assets exclusively provide connection services to YPS, the closure of the power station would render these assets redundant.

5.5.2 Victoria's future generation mix

Victoria's generation mix will undergo significant changes over the coming decade, including during the forthcoming regulatory period.

Recent Victorian and Federal Government policies indicate that significantly increasing the share of renewable generation is a key priority for government. These policies include the:

- **Victorian Renewable Energy Target (VRET)**, which requires that 25% of Victoria's generation come from renewable sources by 2020, and 40% by 2025; and
- **Australia's commitment under the COP21 Paris Agreement**, which requires Australia to reduce its greenhouse gas emissions by 26-28% below 2005 levels by 2030.

Should these targets be achieved, in particular the VRET, Victoria's generation mix will be substantially different in 2025 than it is today. The Victorian Government has stated that:

"It's anticipated that by 2025, up to 5400 megawatts of new large-scale renewable energy capacity will be built in Victoria – representing an estimated \$2.5 billion of investment in the state."¹⁷²

Victoria's current installed generation capacity is around 11,550MW, of which brown coal generation accounts for 6,230MW (54%). Conversely, renewable energy sources (i.e. wind and hydro generation) account for around 2,950MW, or 25%.¹⁷³

Accordingly, substantial changes are required to Victoria's generation mix in order to achieve the targets set for the Australian and Victorian economies.

Already the market is responding to these changes, most recently with the commissioning of the 240MW Ararat Wind Farm expected in May 2017. Furthermore, over 4,700MW of new generation is proposed in Victoria, concentrated in the north west of the State, comprising more than 70% wind.¹⁷⁴

¹⁷¹ <https://www.energyaustralia.com.au/about-us/what-we-do/generation-assets/yallourn-power-station>

¹⁷² <http://www.premier.vic.gov.au/renewable-energy-targets-to-create-thousands-of-jobs/>

¹⁷³ AEMO, 2016 *Electricity Statement of Opportunities*, August 2016.

¹⁷⁴ AEMO, 2016 *Electricity Statement of Opportunities*, August 2016.

There is wide consensus that in order to meet the Victorian Government’s policy targets, substantial brown coal closures will be required. It is expected that HWPS will close by 2020 and YPS by 2025 to achieve the 40% renewable generation targets set by the Government.

The additional 15,000 GWh of renewable energy required under the VRET is around 1.5 times the annual output of HWPS. Consequently, the likely closure of HWPS in 2020 will not be sufficient to provide for the additional renewable energy required by 2025, suggesting YPS closure is required to achieve this target. In June 2016, a Macquarie Securities research note considered that the achievement of the 40% renewable energy target¹⁷⁵ reflected the closure of YPS.¹⁷⁶

AEMO’s 2016 Electricity Statement of Opportunities (ESOO) confirms that generator shutdown is a likely outcome over the forthcoming period, showing that up to 1,600MW of brown coal shut down will occur in Victoria from 2017-18 to 2021-22.¹⁷⁷ This exceeds the 1,450MW generation capacity of YPS.

Figure 5.1: AEMO modelling of generator withdrawals, reproduced

	Retirements by Fuel Type	Capacity (MW)	Region
Neutral economic and consumer outlook			
2017–18	Brown coal	400	Victoria
2020–21	Black coal	560	Queensland
	Brown coal	400	Victoria
Strong economic and consumer outlook			
2018–19	Brown coal	400	Victoria
2020–21	Black coal	560	Queensland
Weak economic and consumer outlook			
2017–18	Brown coal	400	Victoria
2018–19	Brown coal	400	Victoria
2019–20	Brown coal	400	Victoria
2020–21	Black coal	560	Queensland
	Brown coal	400	Victoria

Source: AEMO, 2016 Electricity Statement of Opportunities, August 2016, p. 6.

Importantly, the ESOO projections incorporate only renewable energy targets that have been legislated. Accordingly, the COP21 target is captured in AEMO’s forecasts but the VRET – which will drive significantly more renewable generation – is not. Given this, AEMO’s forecast is a conservative estimate of the magnitude of brown coal generation withdrawals that will occur over the coming decade.

In July 2016, the Victorian Government announced that the VRET would be achieved through a Victorian Renewable Energy Auction Scheme (VREAS), aimed at incentivising renewable energy investment in Victoria. It is possible also that the legislation will incorporate a mechanism designed to expedite the closure of major coal-fired power generation plants, which may well incentivise the owners of those assets to withdraw them from use, but is unlikely to compensate other businesses for loss of associated revenue streams.

Once the relevant VREAS legislation has been passed, AusNet Services expects that the ESOO would show substantially more brown coal generation withdrawal.

¹⁷⁵ While the Macquarie Securities note referred to the 40% VRET being achieved in 2040 and, therefore, YPS closing at that time, correspondence with Macquarie Securities confirmed this was an error and should have stated 2025.

¹⁷⁶ Macquarie Research, *AGL Energy – Retail prices now following C&I*, June 2016, p. 4.

¹⁷⁷ AEMO, 2016 Electricity Statement of Opportunities, August 2016.

For the above reasons, AusNet Services considers that YPS closure by 2025 is a likely outcome, and is proposing remaining asset lives for the relevant connection assets that reflect this timeframe. AusNet Services considers its proposed remaining lives better reflect the nature of the assets over their economic lives, compared to remaining lives based on the economic lives originally assigned to these assets.

Furthermore, adjusting remaining lives ensures the sum of the real value of the depreciation attributable to these assets is equivalent to the value at which those assets were first included in the RAB.

Accordingly, AusNet Services' proposal complies with the attainment of the NEO and other requirements of the NER.¹⁷⁸

5.5.3 Consistency with previous regulatory decisions and the NER

As discussed in section 5.2, the Draft Decision approved the accelerated depreciation of assets that may no longer be utilised to ensure they don't impact revenues and distort prices well into the future.

In its 2016-20 electricity distribution determination for AusNet Services, the AER approved accelerated depreciation for assets that have been replaced, or would be replaced in the 2016-20 period, as part of bushfire safety replacement capital works.¹⁷⁹ The AER considered that the effective economic life of the replaced assets had been reduced and, therefore, accepted AusNet Services' proposal to change its depreciation schedule for these assets to align with the reduced economic life.¹⁸⁰

The Commerce Commission of New Zealand (CCNZ) recently set a regulatory precedent for accelerated depreciation, approving a 15% reduction to remaining lives for all assets as a precautionary measure to respond to a changing energy landscape.¹⁸¹

The evidence available at the time of this Proposal suggests that YPS connection assets will not be utilised over the original lives assigned to them. Reducing asset lives to reflect the likely closure date set out above will align depreciation profiles with the nature of the assets over their economic lives and, therefore, contribute directly towards the attainment of the NEO and meet the requirements of the NER. This approach is also consistent with previous regulatory decisions made by the AER.

5.6 Supporting Documents

The following Appendices are provided to support this Chapter:

- Appendix 5A – The Diminishing Value Approach.
- Appendix 5B – Yallourn Power Station asset values.
- Appendix 5C – Macquarie Securities research note (confidential).

¹⁷⁸ NER cl. 6A.6.3(b)(1) and cl. 6A.6.3(b)(2).

¹⁷⁹ AER, *AusNet Services distribution determination final decision | Attachment 5 – Regulatory depreciation*, May 2016, p. 14.

¹⁸⁰ AER, *AusNet Services distribution determination preliminary decision | Attachment 5 – Regulatory depreciation*, October 2015, p. 14.

¹⁸¹ <https://www.comcom.govt.nz/dmsdocument/14332>

6 Rate of Return and Forecast Inflation

This chapter sets out AusNet Services' response to the Australian Energy Regulator's (AER's) Draft Decision with respect to the rate of return and forecast inflation as set out in Attachment 3 of the Draft Decision. AusNet Services' initial positions were set out in Chapter 10 of the Revenue Proposal.

In the event of inconsistency between information contained in this chapter and AusNet Services' Revenue Proposal, the information contained in this chapter prevails.

6.1 Key Points

- AusNet Services' proposed rate of return maintains flat transmission prices.
- Consistent with the Australian Competition Tribunal's first decision on the AER's Rate of Return Guideline, AusNet Services has adopted the fundamental steps of the AER's Guideline approach for estimating the cost of equity. This approach warrants a higher Market Risk Premium than has recently been applied by the AER, due to the current lowest ever risk free rate. Its proposed cost of equity of 7.2% is among the lowest cost of equity ever allowed by the AER.
- AusNet Services has also applied an alternative (immediate) transition path for implementing the new cost of debt approach. This reflects the Tribunal's finding that the appropriate transition path should reflect the financing practices of an unregulated entity.
- The AER's inflation forecasting methodology does not produce realistic results. The value applied in the Draft Decision (2.44%) is far higher than inflation over the last 12 months (1.0%) and expectations observed in financial markets. At the current time, application of the AER's forecast would result in a negative real risk free being applied to AusNet Services. However, investors can access a positive real risk free return in Australian markets today. Therefore, the AER's inflation forecast does not reflect market realities.
- To achieve consistency in the expected inflation inputs into the revenue model, either:
 - A market-based methodology should be applied; or
 - The nominal WACC should be derived using the real return available in the market and converted to a nominal rate using the AER's inflation forecast.

6.2 Summary

6.2.1 Draft Decision

The AER's Draft Decision on the Rate of Return is 6.16%. The AER broadly applied the approach set out in its Rate of Return Guideline to estimate the allowed rate of return. This is summarised as follows:

- Return on equity – the AER applied the Sharpe-Lintner CAPM as its foundation model. This was parameterised by an equity beta of 0.7 and a Market Risk Premium of 6.5%. The placeholder risk free rate was set before the recent dramatic decline in Commonwealth Government bond yields, and therefore the Draft Decision does not consider how the Guideline should be applied when Commonwealth Government bond yields are at all-time lows.
- Return on debt – the AER estimated the return on debt based on a benchmark credit rating of BBB+ and a benchmark term of 10 years. It applied an average of Bloomberg and RBA yield data over a placeholder averaging period. The AER applied its Guideline transition.

The AER applied its standard methodology to forecasting inflation. This approach takes the geometric average of two years of inflation forecast by the RBA in its most recent statement of monetary policy and eight years of the mid-point of the RBA's target inflation range, being 2.5%.

6.2.2 Revised Revenue Proposal

AusNet Services does not accept the AER's approach to setting the rate of return. The proposed rate of return applied in this Revised Revenue Proposal is 7.41%.

AusNet Services adopts the Guideline approach to estimating the cost of equity, following the Australian Competition Tribunal's first decision on the Rate of Return Guideline. Consistent with the Guideline approach, AusNet Services has relied on multiple sources of evidence in estimating the Market Risk Premium (MRP). Following the recent decline in the risk free rate, estimates of the AER's Dividend Growth Model indicate that the MRP has increased. Cross checks on the cost of equity indicate that there has not been a material decline in the overall cost of equity. The range of evidence set out in the Guideline indicates that a reasonable value of the MRP is 7.50%, resulting in a proposed cost of equity of 7.2%. This proposed cost of equity is amongst the lowest cost of equity ever applied by the AER.

AusNet Services has not applied the AER's Guideline transition, but has reflected the Tribunal's view that the appropriate transition should reflect the financing practices of an unregulated entity. Therefore, this Revised Revenue Proposal adopts an immediate transition to the trailing average cost of debt.

AusNet Services does not accept the use of Bloomberg's BVAL data series to estimate the return on debt, as it has demonstrated that BVAL does not reflect the return debt investors in a benchmark efficient entity require. Recently, the 10 year BVAL curve has relied almost exclusively on the yields of a single bond.

Instead, AusNet Services considers that the RBA data series is more robust and should be applied exclusively. The RBA data series is based on a larger sample of bonds and has moved far in line with expectations over recent periods.

AusNet Services does not accept the AER's approach to estimating expected inflation. It maintains the position in its Revenue Proposal that a market-based estimate provides much more realistic forecasts. It is essential that the two inflation forecasts that feed into the PTRM (the expected inflation input and expected inflation embedded in the nominal WACC) match, to maintain the real value of the RAB, as required by the NER. Therefore, if the AER continues to adopt its approach to estimating expected inflation, the nominal rate of return should be estimated by combining the real market return and the AER's estimate.

The remainder of this chapter is structured as follows:

- Section 6.3 provides background on the Revised Revenue Proposal rate of return and forecast inflation approach;
- Section 6.4 sets out the legislative framework for determining the allowed rate of return and forecast inflation;
- Section 6.5 presents the Revised Revenue Proposal return on equity;
- Section 6.6 presents the Revised Revenue Proposal return on debt;
- Section 6.7 presents the Revised Revenue Proposal on expected inflation;
- Section 6.8 describes the interrelationships between aspects of the rate of return and other building blocks;
- Section 6.9 summarises the Revised Revenue Proposal positions included in this Chapter; and
- Section 6.10 lists the documents submitted to support this Chapter.

6.3 Background

This chapter deals with the allowed rate of return, to be determined as a weighted average of the return on equity and the return on debt on a nominal vanilla basis consistent with the estimate of the value of imputation credits¹⁸² (see Chapter 7 – Tax and the Value of Imputation Credits).

Interrelated with the rate of return is the expectation of inflation used to adjust revenue in order to maintain a real rate of return. Accordingly the methodology for estimating expected inflation is also addressed in this chapter. Relevant interrelationships are also addressed at the end of this chapter.

Network service providers require capital to invest in their business. These funds are provided by the owners (through equity) or lenders (through debt). Both the owners and lenders require a return on the funds they provide and this return reflects the single largest cost to networks.

In order to promote the National Electricity Objective it is crucial that the rate of return is set to enable a network to attract necessary capital and undertake efficient investment in the network in the long term interests of its customers. To promote efficient investment, a regulated network must be provided with a reasonable opportunity to recover its efficient costs, which includes its financing costs. Specifically in relation to the allowed rate of return, this requires:

- The allowed rate of return to be estimated such that it achieves the allowed rate of return objective (**ARORO**), being a rate of return commensurate with the efficient financing costs of a benchmark efficient entity (**BEE**) with a similar degree of risk as that which applies to the network service provider in respect of the provision of the services.
- The return on equity must reflect the returns required by owners in order to invest in the BEE and in doing so have regard to prevailing market conditions.
- The return on debt must provide the network with a reasonable opportunity to recover at least its efficient debt financing costs of the BEE.

The AER published its Rate of Return Guideline in December 2013 (Guideline). The AER has, with some exceptions, largely applied its Guideline approach in its decisions made since 2013.

Since that time, a number of networks have sought merits (and judicial) review of the AER's determinations, including in relation to the return on equity and the return on debt. The Tribunal handed down its decision on a number of reviews in February 2016. The AER has sought judicial review of the Tribunal's decision by the Full Federal Court. This is scheduled to be heard in October 2016.

In addition, a number of merits and judicial review applications remain on foot.¹⁸³

AusNet Services relies upon the following expert reports submitted as Appendices relating to the return on equity and the return on debt submitted in support of this Revised Revenue Proposal:

- Appendix 6A – CEG, Replication and Extension of Henry's beta analysis, September 2016;
- Appendix 6B – Frontier Economics, The market risk premium, September 2016;
- Appendix 6C – CEG, The AER's Current Interpretation of the ARORO, September 2016;
- Appendix 6D – CEG, Criteria for Assessing Fair Value Curves: An Update, September 2016;
- Appendix 6E – CEG, Review of AER Position on Curve Selection;

¹⁸² NER 6A.6.2(d)

¹⁸³ In particular, merits review applications by SA Power Networks (ACT11 of 2015), United Energy Distribution Pty Ltd (ACT 3 of 2016), CitiPower Pty Ltd (ACT 4 of 2016), Powercor Australia Ltd (ACT 5 of 2016), ActewAGL Distribution (ACT 6 of 2016), Jemena Electricity Networks (Vic) Ltd, ACT 7 of 2016 and AusNet Electricity Services Pty Ltd (ACT 8 of 2016).

Other supporting documents submitted and relied upon are listed in Section 6.10. The expert reports relied upon in relation to expected inflation are listed in that section.

6.4 Legislative Framework

The return on capital building block must be calculated by applying a rate of return determined in accordance with NER 6A.6.2 to the value of the regulatory asset base as at the beginning of the relevant regulatory year.¹⁸⁴

The allowed rate of return must be determined such that it achieves the allowed rate of return objective (**ARORO**), being:

“That the rate of return for a Transmission Network Service Provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the Transmission Network Service Provider in respect of the provision of prescribed transmission services.”¹⁸⁵

The rate of return must be a weighted average of the return on equity and the return on debt and determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits.¹⁸⁶

In determining the allowed rate of return, regard must be had to:¹⁸⁷

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

The overarching requirements on the AER in estimating the rate of return are to:

- Perform its regulatory functions in a manner that will or is likely to contribute to the achievement of the NEO, being to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to price, quality, safety, reliability and security of supply of electricity.¹⁸⁸
- Where there are two or more possible decisions open to the AER that will contribute to the achievement of the NEO, the AER must make the decision that it is satisfied will or is likely to contribute to the achievement of the NEO to the greatest degree.¹⁸⁹
- Take into account the Revenue and Pricing Principles (RPP), being relevantly:
 - That a network service provider should be provided with a reasonable opportunity to recover at least the efficient costs the operator incurs in providing direct control network services and complying with a regulatory obligation or requirement or making a regulatory payment.¹⁹⁰
 - A service provider should be provided with effective incentives in order to promote economic efficiency with respect to network services the service provider provides. The

¹⁸⁴ NER 6A.6.2(a)

¹⁸⁵ NER 6A.6.2(c)

¹⁸⁶ NER 6A.6.2(d)

¹⁸⁷ NER 6A.6.2(e)

¹⁸⁸ NEL s16(1)(a)

¹⁸⁹ NEL s16(1)(d)

¹⁹⁰ NEL Section 7A

economic efficiency that should be promoted includes efficient investment in, or in connection with, a transmission system with which the operator provides network services, the efficient provision of electricity network services and the efficient use of the transmission system.

- A price or charge should allow for a return commensurate with the regulatory and commercial risks involved in providing the network service to which that price or charge relates.
- Regard should be had to the economic costs and risks of the potential for under and over investment by a service provider in a transmission system with which the service provider provides network services.
- Regard should be had to the economic costs and risks of the potential for under and over utilisation of a transmission system with which a service provider provides network services.

6.4.1 The Benchmark Efficient Entity (BEE)

A key concept in the determination of the allowed rate of return is the definition of the BEE. The ARORO requires that the rate of return be commensurate with the efficient financing costs of the BEE with a similar degree of risk as that which applies to, in this case, AusNet Services, in respect of the provision of the prescribed transmission services.

In its Guideline and AusNet Services' Draft Decision, the AER defined the BEE as a *pure play, regulated energy network business operating within Australia acting efficiently*.¹⁹¹

This is notwithstanding that the Australian Competition Tribunal has recently found this definition of the BEE to be incorrect. In particular, the Tribunal found that the BEE referred to in the ARORO is not a regulated entity.¹⁹² Rather, the BEE is likely to refer to the hypothetical efficient competitor in a competitive market for those services.¹⁹³ The Tribunal also found that the BEE will not necessarily be identical for all service providers.¹⁹⁴

In this Revised Revenue Proposal, AusNet Services adopts the definition of the BEE that reflects the Tribunal's findings. This is addressed in more detail in AusNet Services' submissions on return on debt below.

6.4.2 Gearing

AusNet Services proposes a gearing ratio of 60%, as applied by the AER in its Guidelines and its recent decisions.

6.5 Return on Equity

6.5.1 The Approach in the AER Guideline

The AER published Rate of Return Guidelines on 17 December 2013 (**Guideline**). In its Guideline, the AER estimates the cost of equity using the "foundation model approach". The AER uses the SL-CAPM to provide what it describes as a starting point estimate. It then uses other relevant material to inform the parameter estimates for the SL-CAPM and to determine the final return on equity estimate.

¹⁹¹ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 24.

¹⁹² *Application by PIAC, Ausgrid*, [2016]ACCompT1, [907].

¹⁹³ *Ibid* at [914].

¹⁹⁴ *Ibid* at [907] and [916].

6.5.2 AusNet Services' Revenue Proposal

In its Revenue Proposal AusNet Services noted that the reforms adopted by the AEMC in 2012 had re-written the NER governing the rate of return allowance and had removed the tightly specified requirements for the AER to adopt the SL-CAPM. In AusNet Services' view, those new NER required the AER to have regard to all the relevant models and other available inputs, not just the sub-set of material that the NER previously required.

AusNet Services expressed its concern that the AER's approach set out in the Guideline and its then recent determinations neither conformed to the new NER, nor provided a market reflective allowed rate of return. AusNet Services argued that in substance the approach adopted by the AER delivered outcomes that are barely distinguishable from, and could have been produced by, the previous regulatory regime. Further, the AER's approach was delivering returns on equity well below the prevailing market conditions.

Having presented independent expert material in support of its views, AusNet Services estimated the cost of equity based on the multi-model approach as it considered this methodology to be the most appropriate and consistent with the requirements of the NER. Under the multi-model approach the expected return on equity is estimated by combining different estimates from a number of models. AusNet Services submitted that extensive research had shown that there is no single financial model which can accurately estimate the return on equity in all economic circumstances and that combining several different models, each with particular strengths, provides a more robust estimate in different economic conditions.

AusNet Service also made a number of specific submissions that in the Guideline (and its then recent determinations):

- The AER made significant errors in relation to the beta value and value for the market risk premium as inputs to the SL-CAPM;
- There is substantial evidence¹⁹⁵ that the SL-CAPM model is significantly downwardly biased when estimating returns for stocks assigned a beta of less than 1.0. There is no sound basis to conclude that the AER's approach of selecting equity beta and MRP from the upper ends of its ranges will numerically compensate for that bias which also undermines the achievement of the rate of return objective and is contrary to the revenue and pricing principles; and
- The Ibbotson and Wright approaches to establishing the MRP are equally valid and each should be used when the SL-CAPM estimate is derived.

6.5.3 The Decision in Ausgrid and the AER's Draft Decision

At the time of AusNet Services' Revenue Proposal, the AER had applied its Guideline approach in the NSW distribution determinations, and a number of others, which were then the subject of applications for review to the Australian Competition Tribunal. In essence, the argument was made that the AER's reliance on the SL-CAPM was inconsistent with the new NER and that the AER instead should have regard to the 'multi-model' approach.

On 26 February 2016 the Tribunal published its determination and reasons on those applications and did not find error in the AER's approach.

In the Draft Decision for AusNet Services the AER noted that the Tribunal's decision and continued with its foundation model approach.

¹⁹⁵ Handley, J., Report prepared for the Australian Energy Regulator: Advice on the return on equity, University of Melbourne, October 2014, p. 5; NERA, Empirical Performance of Sharpe-Lintner and Black CAPMs, February 2015, pp. 42, 51 and 52; NERA, Empirical Performance of Relevant Models for Estimating the Return on Equity, February 2015.

6.5.4 Revised Revenue Proposal

AusNet Services maintains its view that the SL-CAPM has significant shortcomings and that a broader and deeper consideration of other models would be more consistent with the intention behind the AEMC's reforms. However, AusNet Services acknowledges that the Tribunal's decision in *Ausgrid* found the AER's foundation model approach is not an incorrect application of the NER. Accordingly, for the purposes of this proposal AusNet Services applies the foundation model approach and estimates the return on equity using the SL-CAPM.

6.5.5 Parameter Estimates

Risk Free Rate

Consistent with the Guideline, AusNet Services proposes that the risk free rate be estimated based on the average yield on Commonwealth Government Securities (CGS) with a 10 year term over its proposed averaging period.

Equity Beta

In its initial Revenue Proposal AusNet Services submitted that the AER's estimate of the equity beta in the Guideline and its recent decisions was incorrect. In particular, AusNet Services submitted that the AER's estimate based on a very small sample of domestic firms did not take account of broader evidence which suggested an equity beta estimate above 0.7.

Instead, AusNet Services proposed an equity beta of 0.82 based on the opinion of Professors Gray and Hall. Since that time, the Tribunal has found that the AER's approach to estimating equity beta is not subject to error.¹⁹⁶

In its Draft Decision the AER has continued to estimate equity beta to be 0.7, from a range of 0.3 to 0.7. The AER relies primarily on empirical estimates set out in Professor Henry's 2014 report.

AusNet Services continues to hold the view that the AER's estimate of equity beta of 0.7 does not reflect a reasonable estimate of the equity beta of the BEE. One reason for this is that the AER's range is based on a very small sample of empirical estimates which is not a reliable basis on which to estimate equity beta. Further, the AER's approach does not adequately take into account the low beta bias in the SL-CAPM. However, AusNet Services acknowledges the Tribunal's decision finding no error in the AER's approach and for the purposes of this proposal applies the AER's estimate of equity beta of 0.7.

The AER's Draft Decision

The AER relies on Professor Henry's 2014 report which presented empirical estimates of equity beta for a set of nine Australian energy network firms using data from 29 May 1991 to 28 June 2013.

In its Draft Decision for AusNet Services, the AER considered a number of Professor Henry's regression permutations and concluded that the empirical analysis supported a range for equity beta of 0.4 to 0.7.¹⁹⁷

The AER also concluded that Henry's 2014 results indicated a best empirical estimate of approximately 0.5 for a benchmark efficient entity because most of the estimates are clustered around 0.5.¹⁹⁸

The AER states that it also considered other empirical studies using different econometric techniques and comparator sets. The AER considered international empirical estimates and

¹⁹⁶ *In Application by PIAC and Ausgrid*, [2016] ACompT1.

¹⁹⁷ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 234.

¹⁹⁸ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return p. 236.

concluded that it was satisfied that an equity beta of 0.7 reflects a similar degree of systematic risk as AusNet Services is exposed to in providing regulated services because:

- *Our range and point estimate are based on direct measurements (that is, empirical estimates) of the equity beta that businesses with a similar degree of risk as AusNet Services have exhibited in the past. We consider these are reliable indicators of the prevailing, forward-looking equity beta for an efficient business (or benchmark efficient entity) with a similar degree of risk as AusNet Services.*
- *Our range and point estimate are consistent with our conceptual analysis. This suggests the systematic risk of AusNet Services¹⁹⁹ would be less than the systematic risk of the market as a whole (that is, its equity beta would be less than 1.0). Our conceptual analysis is supported by McKenzie and Partington.²⁰⁰*
- *The theoretical principles underpinning the Black CAPM are reasonably consistent with an equity beta towards the upper end of our range. For firms with an equity beta below 1.0, the Black CAPM theory may support using a higher equity beta than those estimated from businesses with a similar degree of risk as AusNet Services when used within a Sharpe-Lintner CAPM. This is a result of the Black CAPM relaxing an assumption underlying the Sharpe-Lintner CAPM, which allows for unlimited borrowing and lending at the risk free rate.²⁰¹ However, we do not consider the theory underlying the Black CAPM warrants a specific uplift or adjustment to the equity beta point estimate. The reasons for our use of the Black CAPM theory are set out in more detail in section B.2.3.*
- *We recognise the importance of providing stakeholders with transparency and predictability in our rate of return decisions, which we consider is consistent with the achievement of the ARORO.²⁰² In this context, a point estimate of 0.7 is consistent with our Guideline (which was developed following extensive consultation) and is a modest step down from previous regulatory determinations.²⁰³*

The AER notes that its direct measurements referred to in the first dot point above are primarily based on Professor Henry's 2014 report.²⁰⁴

Updated Henry Estimates of Equity Beta

The empirical estimates in Henry's 2014 report relied upon by the AER are now three years old. AusNet Services retained CEG to update Henry's empirical estimates to 2016.

CEG replicated and updated Table 3-30 in the AER's Draft Decision which sets out the average of re-levered equity beta estimates from Henry's 2014 analysis (OLS, Weekly)²⁰⁵. CEG extended the analysis from the Henry report to June 2016. The results of CEG's replication and extension of Henry's analysis on individual firm betas over the longest available period, the period excluding the GFC and the "last five years" are set out below:²⁰⁶

¹⁹⁹ More precisely, an efficient business (or benchmark efficient entity) with a similar degree of risk as that which applies to AusNet Services in the provision of standard control or prescribed transmission services.

²⁰⁰ See: McKenzie and Partington, *Report to the AER, Part A: Return on equity*, October 2014, pp. 10–12; Partington, *Report to the AER: Return on equity (Updated)*, April 2015, p. 31; Partington and Satchell, *Report to the AER: Return on equity and comment on submissions in relation to JGN*, May 2015, p. 6; Partington & Satchell, *Report to the AER: Analysis of criticism of 2015 determinations*, October 2015.

²⁰¹ However, the Black CAPM replaces this with an assumption of unlimited ability to short sell stocks.

²⁰² Stakeholders, particularly service providers, sought greater certainty of process. See: AER, *Explanatory statement: Rate of return guideline*, December 2013, p. 51; AEMC, *Final rule determination*, November 2012, pp. 42–43, 45, 50; RARE Infrastructure Limited, *Submission to AER's rate of return guidelines consultation paper*, June 2013; The Financial Investor Group, *Response to the AER's rate of return guidelines consultation paper*, June 2013, p. 1; ENA, *Submission to AER's rate of return guidelines issues paper*, February 2013, p. 4; PIAC, *Submission to AER's rate of return guidelines issues paper*, February 2013, p. 17.

²⁰³ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 64.

²⁰⁴ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 64-65.

²⁰⁵ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 234.

²⁰⁶ Appendix 6A – CEG: *Replication and extension of Henry's beta analysis*, September 2016, Table 13, p. 15.

Table 6.1: Summary of extension results for re-levered OLS weekly individual beta estimates

	Longest available period	Longest available period (excl. tech boom and GFC)	Last five years
Henry original results	0.52	0.56	0.46
CEG extension results	0.60	0.66	0.65
Change	0.08	0.10	0.19

Source: Bloomberg data, CEG analysis

CEG has also replicated and extended Professor Henry's portfolio analysis which forms the basis of the AER's Table 3-31. The updated portfolio analysis is set out in the following Table:²⁰⁷

Table 6.2: Summary of extension results for re-levered OLS weekly portfolio beta estimate

	P1	P2	P3	P4	P5	P6 ²⁰⁸
Equal weighted						
Longest available period	0.52	0.56	0.52	0.53	0.52	0.54
Increase vs Henry	0.06	0.04	0.02	0.05	0.13	N/A
Longest available period (excl. tech boom and GFC)	0.56	0.56	0.58	0.61	0.61	0.64
Increase vs Henry	0.07	0.04	0.03	0.08	0.16	N/A
Value weighted						
Longest available period	0.61	0.76	0.44	0.46	0.54	0.55
Increase vs Henry	0.11	0.06	0.00	0.04	0.15	N/A
Longest available period (excl. tech boom and GFC)	0.66	0.76	0.53	0.56	0.65	0.66
Increase vs Henry	0.12	0.06	0.01	0.06	0.17	N/A

Source: Bloomberg data, CEG analysis

²⁰⁷ Ibid, Table 14 at p. 16.

²⁰⁸ Portfolio 6 was added by CEG and is the same as Portfolio 5, but excluding Envestra (now Australian Gas Networks) because it has been de-listed.

As noted above, the AER considers an equity beta of 0.7 reflects a similar degree of systematic risk as AusNet Services. A primary reason why it holds this view is because its range and point estimate are based on direct measurements of the equity that businesses with a similar degree of risk as AusNet Services have exhibited in the past (being Professor Henry's estimates updated by CEG above). CEG's update of Henry's 2014 empirical estimates show that equity betas have increased since the 2014 report. More recent estimates also show an increase in equity beta. In addition to updating Henry's estimates, CEG has undertaken analysis of the last 52 weeks individual beta estimates (using the same approach as Professor Henry). This shows an average re-levered equity beta of 0.775.²⁰⁹

The AER, in choosing its point estimate of 0.7 from the top end of the range, acknowledges the theoretical principles underpinning the Black CAPM are consistent with an equity beta towards the upper end of its range. That is, for firms with an equity beta below 1, the Black CAPM theory may support using a higher equity beta than those estimated from businesses with a similar degree of risk as AusNet Services when used within a SL-CAPM. The AER says that it does not consider the theory underlying their Black CAPM warrants a specific uplift or adjustment to the equity beta point estimate but it does acknowledge that it is consistent with an equity beta towards the upper end of its range.

As noted above, it remains AusNet Services' position that the AER's approach to equity beta does not give rise to the best estimate. It also does not consider adequate regard is given to the low beta bias in the SL-CAPM. But even on the AER's own approach, using updated Henry 2014 estimates, equity beta has increased.

While AusNet Services has applied an equity beta of 0.7 in the Revised Regulatory Proposal, it still considers the best estimate of equity beta for the BEE is higher than 0.7.

Market Risk Premium

In response to the Draft Decision approach for estimating the MRP and in light of the Tribunal's decision in Ausgrid, AusNet Services adopts the fundamental steps of the Guideline approach of establishing a range of MRP estimates and then selecting a point estimate from within that range. Given the NER require the required return on equity to reflect prevailing market conditions for equity funds, and the risk free rate is currently at historically low levels, AusNet Services has improved the approach taken by the AER in both these steps to establish an estimate for the MRP of 7.5 per cent. In making these improvements, AusNet Services relies on relevant aspects of the Guideline.

The AER's Draft Decision

In its Draft Decision, the AER's estimate for MRP is 6.5 per cent. However, in reaching this estimate the AER has wrongly taken into account averages from historical data and has wrongly and inappropriately used the DGM outputs.

The AER commences by establishing a range of MRP estimates from 4.8 to 8.84 per cent from the bottom of its historical averages and the top of its construction of the DGM. It then derives its point estimate from within this range.

The historical excess returns relied upon by the AER are said to range from 4.8 per cent to 6.0 per cent. The AER refers to a baseline estimate for the MRP of 5.5 to 6.0 apparently reflecting a range based on arithmetic averages.

The AER's DGM estimates indicate a market risk premium estimate above this baseline with a range of 7.57 to 8.84 per cent. The AER considers its DGM model to be theoretically sound but to be subject to certain limitations in practically implementing it. The AER considers the DGM estimates provide some support for a point estimate above the range from historical returns.

²⁰⁹ CEG, Table 12 at p. 13.

Despite these apparent limitations, the AER still uses its DGM estimate to establish the upper point of its range of MRP estimates. Moreover, the AER says it has not changed the weight it applies to the DGM,²¹⁰ but this is difficult to reconcile with its conclusions.

Consistent with the Guideline the AER gives limited consideration to other evidence but broadly concludes it supports its MRP estimate of 6.5 per cent.

Historical Excess Returns

In the Guidelines and its decisions up to April 2015 the AER's view was that the mean historical excess returns supported an MRP range of 5.0% to 6.5%. The bottom of that range was set to 20 basis points above the highest geometric mean estimate and the top of that range was set slightly above the highest arithmetic mean estimate. However, in the Draft Decision the AER appears to change its approach to reporting the evidence from historical excess returns. The AER says:

*"Historical excess returns provide our baseline estimate and indicates a market risk premium of approximately 5.5 to 6.0 per cent from a range of 4.8 per cent to 6.0 per cent. We consider both geometric and arithmetic averages of historical returns. However, we consider there may be evidence of bias in the geometric averages. Therefore, our range for historical returns is based on arithmetic averages."*²¹¹

The AER provides no explanation of why it now adopts 6.0% rather than 6.5% as the top of its range based on arithmetic averages when the arithmetic averages that it has recently reported range between 5.2% and 6.2%, depending on which historical period is considered,²¹² and when two of the five arithmetic mean estimates are above 6.0% and four of the five are above 5.7%. The 4.8% figure is a geometric mean estimate and is therefore irrelevant to a range that is based on arithmetic averages.

Frontier Economics has proposed a corrected arithmetic mean point estimate range of 5.5% to 6.5%. Frontier Economics notes that its range is consistent with the estimates recently reported by the ERA for corresponding time periods. For the reasons set out in section 4.2 of the Frontier Report, AusNet Services adopts a range for historical excess returns of 5.5% to 6.5%.²¹³

DGM Estimates

Like the AER in both the Guideline and the Draft Decision, AusNet Services applies DGM estimates to establish the top of the range for the estimates for the MRP.

The DGM estimate is set by using the AER's most recent DGM estimates of the required return on the market and subtracting the current 10-year government bond yield of 1.9%. This gives a range of 8.4% to 9.4%.²¹⁴

The Range of MRP Estimates

Consistent with the AER's approach in both the Guidelines and the Draft Decision, AusNet Services establishes a combined range from the historical excess returns and DGM ranges. This is set out in the Figure below.

²¹⁰ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 207.

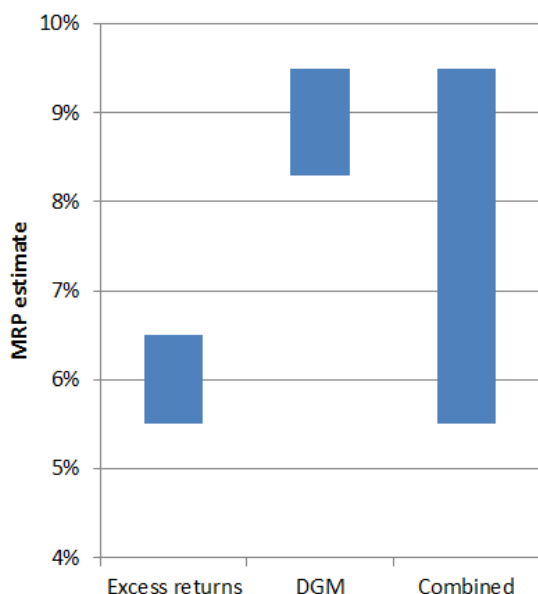
²¹¹ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 59.

²¹² AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, Table 3-22, pp.191-192.

²¹³ Appendix 6B – Frontier Economics: The market risk premium, September 2016 – current p. 29, paragraph 115.

²¹⁴ Appendix 6B – Frontier Economics: The market risk premium, September 2016, p. 72, paragraph 273.

Figure 6.1: Current MRP range – AER Guideline approach



Source: Frontier Economics calculations based on estimates set out in the AusNet Draft Decision, Attachment 3.²¹⁵

A point estimate for the MRP

Having established the combined range, the next step is to select a point estimate for the MRP. The AER's Guideline approach is to select a point estimate from within the combined range where:

"This point estimate lies between the historical average range and the range of estimates produced by the DGM. This reflects our consideration of the strengths and limitations of each source of evidence."²¹⁶

However, in the Draft Decision the AER appears to have altered its approach. This seems to primarily arise from the AER's view that the DGM estimates are not reliable on their own, but that they provide some support for a point estimate above the range from historical returns.

Reliability of DGM estimates

The AER says:

"We are not confident that the recent increases in estimates of the market risk premium from these models necessarily reflect an increase in the 'true' expected ten-year forward looking market risk premium. We consider our, and other, dividend growth models are likely to produce upward biased estimates in the current market. We also consider our, and other, models may not accurately track changes in the return on equity for the market. For these reasons, we do not consider that the dividend growth model estimates are reliable on their own, but that they do provide some support for a point estimate above the range from historical returns."²¹⁷ [footnotes removed]

It is not clear why the AER's view on its own DGM approach has changed so markedly since the Guideline. In the Guideline, the AER stated that the DGM approach has the attractive features of being a forward-looking estimate that is more likely to reflect the prevailing market conditions than other approaches and that its then expressed concerns about the reliability of input parameters were mitigated by its preferred implementation.

²¹⁵ Appendix 6B – Frontier Economics: The market risk premium, September 2016, p. 11, paragraph 35

²¹⁶ AER, *Rate of Return Guideline*, Explanatory Statement, p. 97.

²¹⁷ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 59.

For the reasons expressed in section 7.2 of the Frontier Report, AusNet Services submits that the concerns the AER raises in its Draft Decision are not new or have not intensified since then and there is no reason to suggest that the AER's concerns are any more or less important than at the time of the Guideline. Since the Guideline, the only thing that has changed in relation to the AER's DGM estimates is that they are now higher.

A point estimate above the range from historical returns

Even if the DGM estimates only provide some support for a point estimate above the range from historical returns, once that range is corrected to be 5.5% to 6.5%, it is clear that on the AER's own analysis a MRP estimate of 6.5% is too low.

A point estimate from the combined range

Frontier Economics has identified the sorts of considerations that the AER applied when selecting its Guideline MRP of 6.5%. Applying those same sorts of considerations to the current evidence that the AER has compiled, the result is an estimate of 7.5%.²¹⁸

Frontier identifies the following factors that appear to be relevant to the AER's adoption of a point estimate MRP of 6.5% in the Guideline at that time:

- a) The AER's historical excess returns mid-point estimate is 6.0%²¹⁹ and its mid-point three-stage DGM estimate is 7.1%.²²⁰ The mid-point of these two estimates is 6.55%;
- b) The AER adopted an upper bound of 6.5% from its historical excess returns approach and a lower bound of 6.7% from its three-stage DGM approach. The mid-point of this gap between the two ranges is 6.6%;
- c) The AER's historical excess returns range and two-stage DGM range overlapped in the region of 6.1% to 6.5%. The mid-point of this region of overlap is 6.3%;
- d) The combined range adopted by the AER was 5.0% (the lower bound of the excess returns range) and 7.5% (the upper bound of the DGM range). The mid-point of the combined range is 6.3%; and
- e) If the historical excess returns range is based on arithmetic means (which is consistent with the AER's subsequent decisions) the combined range is 5.7%²²¹ to 7.5%, with a mid-point of 6.6%.

Frontier reaches an estimate for the MRP adopting these factors as follows:

- a) The AER stated that its preferred historical excess returns estimate is 6.0%²²² and its mid-point three-stage DGM estimate is now 9.0%. The mid-point of these two estimates is 7.5%;
- b) The upper bound of the AER's historical excess returns approach is 6.5% and the lower bound from the AER's three-stage DGM approach is 8.4%. The mid-point of this gap between the two ranges is 7.5%;
- c) At the time of the Guideline, the AER's historical excess returns range and its two-stage DGM range overlapped. In the current market conditions, the upper bound of the historical excess returns range is 6.5% and the lower bound of the two-stage DGM range is 8.2%. The mid-point of the gap between these two ranges is 7.4%; and

²¹⁸ Appendix 6B – Frontier Economics: The market risk premium, September 2016, pp. 71-73, paragraphs 270-274.

²¹⁹ AER, *Rate of Return Guideline*, Explanatory Statement, p. 93.

²²⁰ The AER has subsequently stated its preference for the three-stage specification of the DGM. See, for example, JGN, *Draft Decision*, Attachment 3, Appendix C, p. 222.

²²¹ AER, *Rate of Return Guideline*, Explanatory Statement, p. 93.

²²² AER, *Rate of Return Guideline*, Explanatory Statement, p. 97.

- d) The combined range is from 5.5% (the lower bound of the excess returns range) and 9.4% (the upper bound of the DGM range).²²³ The mid-point of the combined range is 7.5%.

For the reasons set out in section 8 of the Frontier Report, AusNet Services adopts this point estimate of the MRP of 7.5%.

Other relevant material

The AER states:

“Survey evidence supports a market risk premium around 6.0 to 6.5 per cent. Other regulators’ estimates are used as a cross check and indicate a market risk premium estimate of around 6.5 per cent is reasonable. Conditioning variables indicate that there has not been a material change in market conditions since our October and November 2015 decisions.”²²⁴

In AusNet Services’ view, this material should either be given no weight or alternatively regarded as supporting an MRP of 7.5%.

The AER’s reliance on survey evidence

Survey evidence is unreliable and should be given no material weight because of methodological shortcomings relating to such issues as the nature of the respondents, the survey response rate and any potential bias in the response rates of different groups, when the survey was conducted and the level of government bond yields at the time, the content and relevance of the questions asked and how and for what purpose the MRP is used.

Moreover, the MRP figures reported in surveys are ex-imputation estimates – they have not been grossed-up to reflect the AER’s assumed value of imputation credits. Consequently, before they can be compared to the AER’s (with-imputation) 6.5% allowance, they must be adjusted. By way of example, the QCA has concluded that this adjustment requires the addition of 83 basis points.²²⁵

Other regulator’s decisions

Other regulator’s decisions indicate that a market risk premium estimate exceeding 6.5 per cent is reasonable.

When regulatory decisions made under regulatory regimes with characteristics similar to the NER (or decisions are adjusted to be comparable to decisions made under the NER) are given appropriate weight, these decisions support a MRP of over 7% and in some cases over 8%.²²⁶

Conditioning variables

In the Guideline and its recent final decisions the AER has regard to a number of ‘conditioning variables’ as a qualitative cross check of its return on equity allowance. These include:

- Dividend yields – used as a directional indicator of the market risk premium;
- Volatility implied by option prices – this approach assumes that the market risk premium is the price of risk multiplied by the volume of risk; and
- Yield spreads – includes credit spreads, to inform estimates of the market risk premium, and the spread between the AER’s estimated equity risk premium and debt risk premium.

AusNet Services submits that no reliance should be placed on the conditioning variables in the absence of a formal econometric mapping of these conditioning variables to a point estimate of the MRP. In the prevailing market conditions of record low government bond yields, the

²²³ Note that the upper bound is currently the same for the AER’s two-stage and three-stage DGM approaches.

²²⁴ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 59.

²²⁵ Appendix 6B – Frontier Economics: *The market risk premium*, September 2016, pp. 34-35, paragraphs 128-130.

²²⁶ Appendix 6B – Frontier Economics: *The market risk premium*, September 2016, p. 13, paragraph 39.

challenge of mapping conditioning information to a point estimate of the MRP is particularly difficult. This is because some of the conditioning variables relate to required returns whereas others relate to risk premiums. For example, the dividend yield is related to overall required returns – a higher yield implies that a given set of dividends is being discounted at a higher rate. By contrast, corporate bond spreads relate to risk premiums.

When government bond yields are near their long-run average levels, this distinction is much less important as risk premiums in the current and the historical data are computed by subtracting the same base risk-free rate. The analysis in the prevailing market conditions is complicated by the fact that current government bond yields are so far below the historical average over the period for which conditioning information is available.²²⁷

However, to the extent reliance is placed on conditioning variables, they are generally consistent with a stable required return on equity and a higher MRP than estimated by the AER.

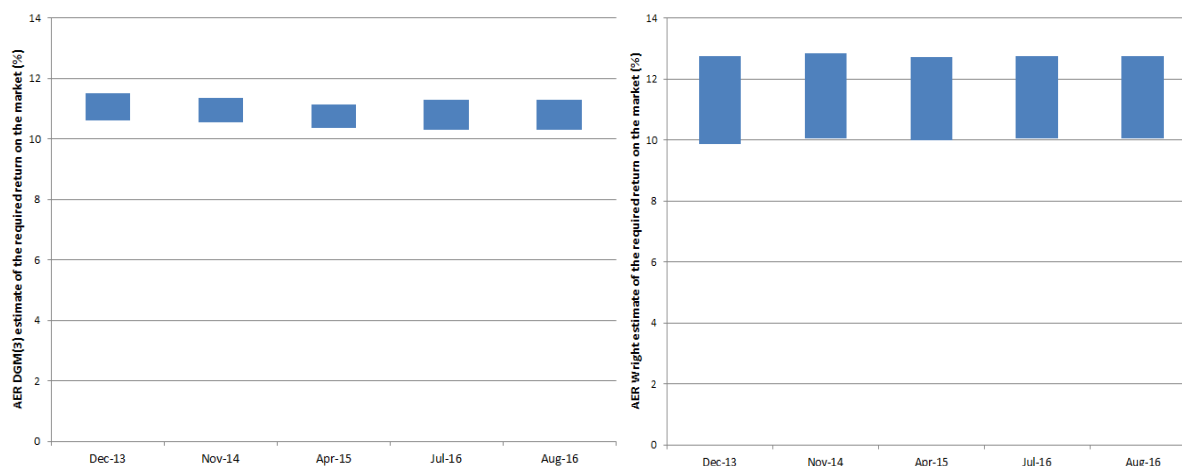
Market and other evidence of the required return on equity

The DGM and Wright estimates of the required return on equity

For the reasons discussed above, AusNet Services considers that the AER's view that the DGM estimates of the required return on equity are unreliable is wrong.

Applying the AER's three-stage DGM suggests that the overall required return on equity has remained remarkably stable since the Guideline, even as government bond yields have fallen sharply. This is illustrated in Figure 6.2 below. The AER also reports that its Wright estimates of the required return on the market have remained stable since the Guideline, as summarised in Figure 6.3 below

Figures 6.2 and 6.3: AER three-stage DGM and Wright estimates of the required return on the market



Source: AER Rate of Return Guideline; AER Ausgrid Draft Decision; AER Ausgrid Final Decision; AER Citipower Final Decision; Frontier Economics updated calculations.

Moreover, evidence from a range of respected market participants is consistent with the weight of evidence set out above – that the required return on equity has remained relatively stable even as government bond yields have fallen. This position is supported by:²²⁸

- Central banks such as the Reserve Bank of Australia and the Federal Reserve Bank of New York;
- Other regulators such as Ofgem, FERC, the ERA, and IPART;

²²⁷ Appendix 6B – Frontier Economics: The market risk premium, September 2016, paragraph 149.

²²⁸ Frontier Economics: The market risk premium, September 2016 pages 46-54-, paragraphs 170-199.

- Corporate advisory firms such as McKinsey and NERA-US; and
- Independent expert firms such as EY, KPMG, Deloitte, and Lonergan Edwards.

The AER's Draft Decision on MRP does not achieve the ARORO

The requirements of the NER

The NER require a forward-looking estimate of the MRP that is commensurate with the prevailing conditions in the market for equity funds.

Historical excess return estimates

The historical excess returns approach estimates the MRP by taking the mean excess return over a long historical period. Self-evidently, this estimate must reflect the average market conditions over the historical period that was used. Logically, this approach can only produce a forward-looking estimate that is commensurate with the prevailing conditions in the market in two circumstances:

- Investors always require the same MRP in all market conditions; or
- The current market conditions are the same as the average market conditions over the historical period.

Neither of these conditions is likely to hold.

The prospect that investors always require the same risk premium in all market conditions is inconsistent with the generally accepted view that risk premiums are higher during recessions and financial crises and lower during economic expansions. It is also inconsistent with the AER's own view that the MRP likely varies over time.²²⁹

The alternative motivation for the use of mean historical excess returns is that the current market conditions are the same as the average market conditions over the historical period. However, the prevailing market conditions are very different from the average historical conditions in that the current government bond yield (to which the MRP is added to produce the allowed return on equity) is at all-time historical lows.

For the reasons set out in section 3.3 of the Frontier Report, in these circumstances it is illogical to use historical excess return estimates in the manner adopted by the AER in its Draft Decision. There is no reason to conclude that the AER's use of a consistent historical excess returns approach would, in the current circumstances, produce a forward-looking MRP that is commensurate with the prevailing conditions in the market for equity funds.

A consistent MRP allowance

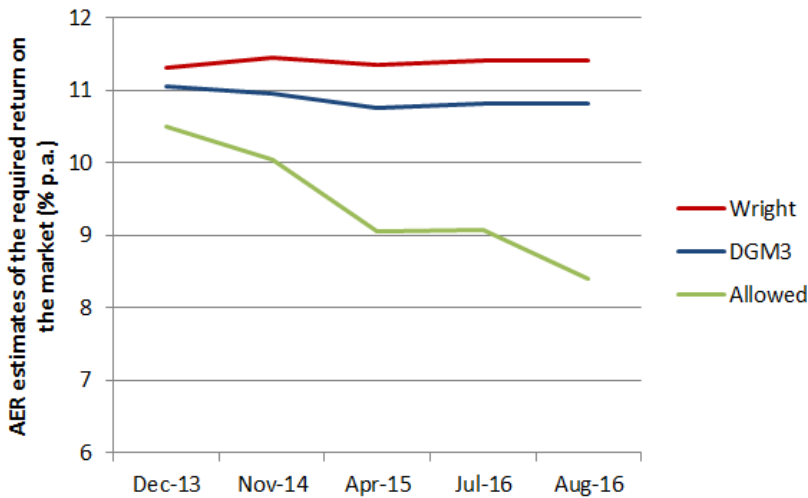
Since the Guideline, the AER has allowed an MRP of 6.5% in every one of its draft and final decisions.

As Frontier discusses in section 6 of its Report, the consequence of this is that the allowed return on equity falls one-for-one with falls in government bond yields. The AER adds its risk premium to the contemporaneous government bond yield and the sum is adopted as the allowed return on equity. Since government bond yields have fallen sharply since the Guideline, the AER's allowed return on equity has also fallen correspondingly.

However, as shown above, the forward looking evidence, not the MRP, is that the required return on equity has remained stable since the Guidelines. The distinction between the AER's estimates and its regulatory allowance is summarised in the Figure below.

²²⁹ AER (2013), *Rate of Return Guideline*: Explanatory Statement, p. 91.

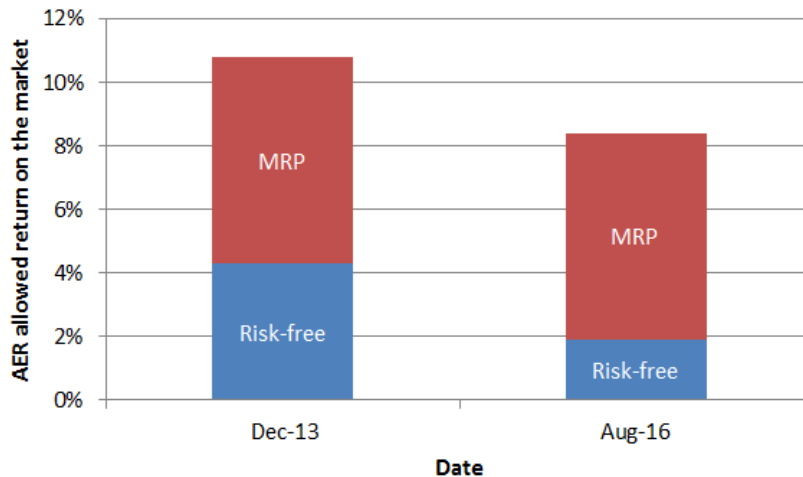
Figure 6.4: The required return on the market – AER estimates and allowances



Source: Rate of Return Guideline, Explanatory Statement, Appendix; Ausgrid Draft Decision Attachment 3; Ausgrid Final Decision Attachment 3; AusNet Services Draft Decision Attachment 3.

Since its Guideline in December 2013, the yield on 10-year Commonwealth government bonds has fallen from 4.1% to 1.9%.²³⁰ However, the AER has maintained the same 6.5% MRP in its decisions since December 2013. Thus, the AER considers that the required return on equity for the average firm²³¹ has fallen from 10.6%²³² in December 2013 to 8.4%²³³ now. This represents a decline of more than 25% over the last two and a half years, as illustrated in the Figure below.

Figure 6.5: AER estimate of the required return on equity for an average firm



Source: AER Rate of Return Guideline, December 2013; MRP allowance from AusNet Services' Draft Decision, May 2016; RBA current 10-year government bond yield August 2016.

By contrast, there is a substantial body of evidence to support the propositions that:

- Real-world investors do not determine the return that they require by simply adding a constant figure to the contemporaneous government bond yield; and

²³⁰ <http://www.rba.gov.au/statistics/tables/xls/f02hist.xls>.

²³¹ Which, under the CAPM, is equal to the sum of the risk-free rate and the MRP.

²³² 4.1% + 6.5%.

²³³ 1.9% + 6.5%.

- The required return on equity has not fallen by over 25% in the last two and a half years.

The AER's approach to setting the MRP to date produces implausible outcomes in some market conditions, including the current market conditions. These implausible outcomes arise because the AER's estimation approach produces a consistent estimate of the MRP. This results in an allowed return on equity that is volatile – it rises and falls one-for-one with every change in government bond yields.

In some market conditions, the true required return on equity may well fall when government bond yields fall. However, in other market conditions the required return on equity may stay constant, or even rise, as government bond yields fall. It depends on the reasons why the government bond yield has fallen.

The application of the AER's approach assumes that the required return on equity always falls one-for-one with every decline in government bond yields. This assumption leads to implausible estimates in some market conditions, including the current market conditions.

6.5.6 Cross Checks on the Overall Return on Equity

In its Draft Decision, the AER forms the view that, on the whole, the other material supports its foundation model estimate of the return on equity. AusNet Services disagrees.

The AER considers that in conducting cross checks the relevant matter is the equity risk premium. However, this is an extension of its approach of simply adding a fixed premium to the contemporaneous government bond yield and is therefore flawed and unreasonable for the reasons discussed above. Moreover, under the NER, it is the return on equity that is relevant. The cross checks should be conducted at the return on equity level, not the equity risk premium level, as the equity risk premium is only one part of the overall return on equity.

As Frontier notes²³⁴, even if it were the case that the equity risk premium allowed by the AER were consistent with that adopted by some market practitioners, the task would not finish there – it would still be necessary to consider the other elements of the return on equity. There is evidence that market practitioners regularly adopt higher risk-free rates and apply other uplifts to the return on equity. Moreover, these adjustments and uplifts tend to increase in frequency and magnitude as government bond yields fall – as they have in the prevailing market conditions. Thus, a cross check that ignores these elements will be incomplete.

In any event there are a number of problems with the AER's approach. Frontier gives two examples.²³⁵ Firstly, that the AER's conclusion that its allowed equity risk premium lies within the Grant Samuel range fails to recognise that Grant Samuel specifically disavowed its mechanistic range as being inappropriate for current market conditions and, for use in its valuation, Grant Samuel corrected that range to one (adjusted for imputation) that the AER's equity risk premium falls outside and below. Second, an example is given of an adjustment to the risk-free rate which, when taken into account, also produces a premium materially above the AER's allowance.

The AER's stated reasons for disregarding this material is based upon supposition that these adjustments may be made in a manner that is inconsistent with the ARORO. However, the AER's conjecture is without foundation, whereas the evidence is clear that market practitioners make uplifts to mechanistic CAPM estimates and risk free rates in order to reflect prevailing conditions in the market for equity funds.

6.5.7 Return on Equity Averaging Period

AusNet Services accepts the cost of equity averaging period included in the Draft Decision.

²³⁴ Appendix 6B – Frontier Economics: *The market risk premium*, September 2016, p. 44, paragraph 165.

²³⁵ Appendix 6B – Frontier Economics: *The market risk premium*, September 2016, pp. 41-43, paragraphs 154-160.

6.5.8 SL CAPM Parameter Estimates

AusNet Services' Revised Revenue Proposal adopts the SL CAPM parameter estimates set out in the Table below.

Table 6.3: SL CAPM Parameter Estimates

Parameters	Revised Revenue Proposal
Risk free rate	1.97%*
Equity beta	0.7
Market Risk Premium	7.5%
Cost of Equity	7.2%**

* Observed over a placeholder averaging period of 1 to 28 July 2016.

** Rounded to 1 decimal place consistent with the Rate of Return Guideline.

6.6 Return on Debt

6.6.1 Summary

AusNet Services agrees with, and accepts, the AER's approach to determining the return on debt using a trailing average approach on the basis that this approach recognises that, in practice, the actual return on debt of a benchmark efficient entity (**BEE**) will be determined by historical rates at the time of debt issue. This approach better reflects the actual practice of energy networks and other businesses that raise debt with staggered maturities, and is a more replicable approach, than the "on-the-day" methodology previously adopted by the AER. AusNet Services also agrees with the AER's use of a 10-year debt term in estimating the return on debt.

AusNet Services notes the Tribunal does not agree that the transition (from the previous "on-the-day" approach to a trailing average approach to estimating the return on debt) applied by the AER complies with the NER, the NEO or the ARORO, nor does it agree with some other discrete aspects of the AER's implementation of the trailing average approach.

In its Revenue Proposal, AusNet Services noted that a decision of the Australian Competition Tribunal (**Tribunal**) on the appropriate form of transition was about to be handed down,²³⁶ and that AusNet Services would consider that decision. In that decision, the Tribunal found error in the transition applied by the AER (being the same transition applied by the AER in its Draft Decision for AusNet Services). In its Draft Decision, the AER addressed different forms of transition, as it recognised that AusNet Services may 'consider[s] these positions relevant in light of the recent Tribunal decisions'.²³⁷

Consistent with the reasoning of the Tribunal in *Ausgrid*, AusNet Services submits that the BEE required to be considered in the context of the ARORO is an unregulated firm operating in a competitive market.²³⁸

²³⁶ *Applications by Public Interest Advocacy Centre Ltd and Ausgrid* [2016] ACompT 1 (**Ausgrid**); *Applications by Public Interest Advocacy Centre Ltd and Endeavour Energy* [2016] ACompT 2; *Applications by Public Interest Advocacy Centre Ltd and Essential Energy* [2016] ACompT 3; *Application by ActewAGL Distribution* [2016] ACompT 4; *Application by Jemena Gas Networks (NSW) Ltd* [2016] ACompT 5.

²³⁷ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 94.

²³⁸ *Ausgrid*, [907] and [914].

It follows that the unregulated BEE would not have structured its debt financing in such a way as to respond to the previous regulatory framework – or, therefore, to hedge its debt in such a way as to respond to the AER’s previous “on-the-day” approach to estimating the return on debt. Rather, the unregulated BEE would already have a portfolio of staggered debt,²³⁹ and there is no need for any transition (other than an immediate one) from the “on-the-day” approach to a trailing average approach to estimating the return on debt.

Further and in any event, the Tribunal has found that the transition adopted by the AER is not appropriate, and does not satisfy the requirements of the NER, as it is not an approach that is replicable by the BEE or any regulated service provider (as a business cannot, as assumed by the AER’s transition, hedge the debt risk premium (**DRP**) component of its debt portfolio).

AusNet Services has not adopted the reasoning provided by the AER in its Draft Decision justifying the transition, given the Tribunal’s view on debt transition. That reasoning, which is based on the “zero NPV investment condition” as interpreted by the AER, differs from the AER’s previous justification for the imposition of a transition (as set out in the Rate of Return Guideline and in its 2014 and 2015 decisions), is internally inconsistent, and is inconsistent with its own interpretation of the “zero NPV investment condition” in previous decisions. It also fails to address the key question posed by the ARORO – namely, what are the efficient financing costs of a BEE.²⁴⁰

Alternatively, if a transition to the trailing average approach is justified, AusNet Services does not agree that the form of transition proposed by the AER best satisfies the NER or the ARORO. The transition assumes that the BEE can hedge the DRP component of its debt portfolio which the AER itself recognises is not possible. Any transition should only be applied to the base rate component of the return on debt (**hybrid transition**).

AusNet Services notes that the Tribunal has recently heard an application by SA Power Networks (**SAPN**) in which SAPN sought merits review of the AER’s decision to impose its transition in place of SAPN’s proposed hybrid transition.²⁴¹

AusNet Services also disagrees with the AER’s reliance on a simple average of Reserve Bank of Australia (**RBA**) and Bloomberg data to calculate the return on debt in circumstances where the RBA continues to outperform Bloomberg in terms of the appropriateness and size of the datasets, the transparency of its bond selection and curve fitting methodologies and its track record for accuracy.

While this issue was discussed briefly in the Tribunal’s decision in *Ausgrid* (and no reviewable error found in the AER’s decision), AusNet Services submits that further evidence has come to light since the AER’s 2015 decisions that further establishes the superiority of the RBA data as compared to Bloomberg. The Bloomberg curve has, since about July 2015, been disproportionately influenced by, and moved almost in ‘lock step’ with, the yield of a single bond (the Asciano bond). More recently, the Bloomberg curve has been impacted by the addition of two newly issued bonds to the sample (by Jemena and Mirvac), which have caused erratic movements in Bloomberg’s yield estimates. These issues emphasise the difficulties that arise from the small dataset utilised by Bloomberg and the lack of transparency of its bond selection and curve fitting methodologies.²⁴²

The consequence of the AER’s approach to transition and data sources is that the AER’s approach to estimating the return on debt underestimates the efficient debt financing costs of a BEE with a similar degree of risk as that which applies to AusNet Services and therefore does not

²³⁹ Appendix 6C – CEG, *The AER’s current interpretation of the ARORO*, September 2016, section 9.

²⁴⁰ Appendix 6C – CEG, *The AER’s current interpretation of the ARORO*, September 2016.

²⁴¹ ACT 11 of 2015, heard in August 2016, decision reserved.

²⁴² Appendix 6D – CEG, *Criteria for assessing fair value curves: an update*, September 2016.

comply with the NER. As a result, AusNet Services will not be able to recover at least its efficient costs (as required by the NEL).

It is acknowledged that the AER has sought judicial review of the Tribunal's decision in *Ausgrid* and the other decisions delivered on the same day. The AER has continued to apply its approach to transition in subsequent decisions, contending that the Tribunal decisions on the return on debt are incorrect.

AusNet Services has adopted the approach to estimating the return on debt involving the immediate implementation of the trailing average approach (with no transition), based on the data published by the RBA. Alternatively:

- If a transition is justified, then AusNet Services submits that the appropriate form of transition is a hybrid transition of just the base rate component of the return on debt; and
- If data from Bloomberg is to be used in calculating the trailing average cost of debt, data from Reuters should also be included (and given equal weight to Bloomberg) in any averaging of third party data sources (on the basis that Reuters' performance is at least as good as Bloomberg's and there is no justifiable reason to give equal weight to data from RBA and Bloomberg and zero weight to data from Reuters).²⁴³

6.6.2 Background

Prior to the issue of its Rate of Return Guideline in December 2013 (**Guideline**), the AER's approach to estimating the cost of debt involved the use of an "on-the-day" approach, under which a fixed prevailing rate of return on debt was estimated and applied throughout the regulatory control period.

In the Guideline, the AER proposed to move to a trailing average approach to estimating the cost of debt under which:

"...The trailing average will be calculated using a simple 10 year average and will be updated annually. The yearly average will be calculated over a period of 10 or more consecutive business days using yield estimates from an independent third party service provider for a 10 year debt term and the closest proximate for a BBB+ credit rating. There will be a 10 year transition period from the current 'on the day' approach to the trailing average portfolio approach."²⁴⁴

Transition

The 10 year transition proposed by the AER involved a transition of the entire return on debt (i.e. not just the risk-free rate component) over a ten year period such that:

- In the first year, the return on debt would be based entirely on the prevailing rate of return (similar to the "on-the-day" approach);
- In the second year, the prevailing rate of return would be given 90% weight and 10% weight would be given to the observed rate in the first year;
- In the third year, the prevailing rate of return would be given 80% weight and 10% weight would be given to the observed rates in each of the first and second years; and
- So on, until in the tenth year the rate of return would be a full trailing average with equal weighting given to each of the observed rates over the previous ten years.²⁴⁵

²⁴³ Appendix 6D – CEG, *Criteria for assessing fair value curves: an update*, September 2016.

²⁴⁴ Guideline, p. 4.

²⁴⁵ Guideline, pp. 19-20.

The AER first implemented the trailing average approach to estimating the cost of debt, and its proposed 10 year transition, in a number of distribution determinations made under the NER in April 2015²⁴⁶ and an access arrangement final decision made under the National Gas Rules in June 2015.²⁴⁷

The businesses that were the subject of those determinations and decisions sought merits review of the AER's decisions in respect of the return on debt (amongst other things) and, on 26 February 2016, the Tribunal found error in the AER's decisions for each service provider and remitted the decisions "*in relation to the trailing average approach*" to the AER to be remade.²⁴⁸ Those remitters are yet to be completed by the AER.

The AER has sought judicial review of the Tribunal's decisions in *Ausgrid et al*, including in relation to the return on debt, which are yet to be heard by the Federal Court.

In its Draft Decision in respect of AusNet Services' Revenue Proposal, and notwithstanding the Tribunal's findings, the AER has maintained the same approach to a 10 year transition to the implementation of the trailing average, although it has sought to justify that approach on a different basis.

AusNet Services agrees with the change to using a trailing average approach to estimate the return on debt, but has not adopted the 10 year transition applied by the AER in its Draft Decision for the reasons set out in more detail below.

Data Sources

The Guideline provided that the trailing average would be calculated "[u]sing the published yields from an independent third party data service provider",²⁴⁹ but did not specify the third party provider or providers to be used. In its Draft Decision (as in other recent decisions since publication of the Guideline), the AER has determined to adopt a simple average of 10-year debt data published by the RBA and Bloomberg.

AusNet Services also disagrees with that approach.

6.6.3 Legislative Framework

NER 6A.6.2 provides that:

- The return on debt must be estimated such that it contributes to the allowed rate of return objective (ARORO) (NER 6A.6.2(h));
- The return on debt may be estimated using a methodology which results in the return on debt being the same or different (or potentially different) for each regulatory year in the regulatory control period (in the latter case, any resulting change to the annual revenue requirement must be effected through the automatic application of a formula specified in the revenue determination (NER 6A.6.2(l)) (NER 6A.6.2(i));
- The methodology adopted to estimate the return on debt may, without limitation, be designed to result in the return on debt reflecting either of, or a combination of, the following:

²⁴⁶ Distribution determination final decisions published on 30 April 2015 for each of Ausgrid, Endeavour Energy, Essential Energy and ActewAGL Distribution.

²⁴⁷ Final access arrangement decision published on 3 June 2015 for Jemena Gas Networks (NSW) Ltd.

²⁴⁸ *Ausgrid*, order 1(b); *Applications by Public Interest Advocacy Centre Ltd and Endeavour Energy* [2016] ACompT 2, order 1(b); *Applications by Public Interest Advocacy Centre Ltd and Essential Energy* [2016] ACompT 3, order 1(b); *Application by ActewAGL Distribution* [2016] ACompT 4, order 1(c); *Application by Jemena Gas Networks (NSW) Ltd* [2016] ACompT 5, order 1(a).

²⁴⁹ Guideline, p. 21.

- the return that would be required by debt investors in a BEE if it raised debt at the time or shortly before the making of the revenue determination for the regulatory control period;
- the average return that would have been required by debt investors in a BEE if it raised debt over an historical period prior to the commencement of a regulatory year in the regulatory control period.²⁵⁰
- Regard must be had to the following factors in estimating the return on debt:
 - the desirability of minimising any difference between the estimated return on debt and the return on debt of a BEE referred to in the ARORO;
 - the interrelationship between the return on equity and the return on debt;
 - the incentives that the return on debt may provide in relation to capital expenditure over the regulatory control period, including as to the timing of any capital expenditure; and
 - any impacts (including in relation to the costs of servicing debt across regulatory control periods) on a BEE that could arise as a result of changing the methodology that is used to estimate the return on debt from on regulatory control period to the next²⁵¹.

In relation to the return on debt, the AER is also required to make its decision in a manner that will or is likely to contribute to the achievement of the national electricity objective (**NEO**).²⁵² Further, where there are two or more possible decisions that will or will be likely to contribute to the achievement of the NEO, the AER must make the decision that it is satisfied will or is likely to contribute to the NEO to the greatest degree and specify the reasons as to the basis on which that is the case.²⁵³

The AER must also take into account the revenue and pricing principles (**RPP**) set out in section 7A of the NEL.

6.6.4 Revised Revenue Proposal

AusNet Services maintains its proposal that the return on debt be estimated using a trailing average approach, based on a benchmark credit rating of BBB to BBB+ derived from data published by the RBA, and using a 10 year term to maturity.

AusNet Services also proposes that the trailing average methodology be implemented immediately (i.e. in the first year of the regulatory control period) without any period of transition from the previous “on-the-day” approach. This represents a change as compared to the proposal in AusNet Services’ Revenue Proposal consistent with the decisions of the Tribunal in *Ausgrid et al* (which AusNet Services expressly noted it would consider once handed down). In its Draft Decision, the AER acknowledged that AusNet Services may ‘consider[s] these positions relevant in light of the recent Tribunal decisions’.²⁵⁴

This Revised Revenue Proposal gives rise to an indicative cost of debt of 7.56% in the first year of the regulatory control period calculated over AusNet Services’ placeholder averaging period.

6.6.5 The AER’s Approach to the Return on Debt

On 20 July 2016, the AER published its Draft Decision in respect of AusNet Services’ transmission determination for the period 2017-22.

²⁵⁰ NER 6A.6.2(j)

²⁵¹ NER 6A.6.2(k)

²⁵² Section 16(1)(a) of the NEL.

²⁵³ Section 16(1)(d) of the NEL.

²⁵⁴ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 94.

In its Draft Decision, the AER has adopted an indicative return on debt for the first regulatory year of the regulatory control period (based on AusNet Services' placeholder averaging period) of 5.54%.²⁵⁵ This is calculated:

- Using a 10 year transition from the “on-the-day” approach to a trailing average approach in the manner set out in the Guideline;²⁵⁶
- Adopting a 10 year debt term for the BEE (as per the Guideline);²⁵⁷
- Adopting a BBB+ credit rating for the BEE (as per the Guideline);²⁵⁸
- Using a simple average of two independent third party data sources, namely:
 - The 10 year estimate from the non-financial corporate BBB rated data series published by the RBA (adjusted to extrapolate the data series from a ‘target’ 10 year term to an ‘effective’ 10 year term, to interpolate the monthly data points to produce daily estimates, and to convert the estimates from semi-annual to an effective annual rate); and
 - The 10 year yield estimate from the Australian corporate BBB rated Bloomberg Valuation Service (BVAL) data series published by Bloomberg (adjusted to convert the estimates from semi-annual to an effective annual rate);²⁵⁹
- Without applying any “new issue premium” to the resulting estimates;²⁶⁰ and
- Adopting a gearing ratio of 60% for the BEE (as per the Guideline).²⁶¹

The AER and AusNet Services remain divided on the issues of:

- The need for (and form of) a transition to the trailing average approach; and
- The independent third party data sources to be used.

Each of these points are addressed below.

6.6.6 Transition

The Benchmark Efficient Entity (BEE)

The NER require that both the overall allowed rate of return be determined such that it achieves the allowed rate of return objective (**ARORO**),²⁶² and that the return on debt for each regulatory year be estimated such that it contributes to the achievement of the ARORO.²⁶³

The ARORO is that:

“...the rate of return for a Transmission Network Service Provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the Transmission Network Service Provider in respect of the provision of prescribed transmission services...”²⁶⁴

²⁵⁵ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 93.

²⁵⁶ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 93-104.

²⁵⁷ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 105-106.

²⁵⁸ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 106-109.

²⁵⁹ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 111-123.

²⁶⁰ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 123-124.

²⁶¹ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 128-129.

²⁶² NER 6A.6.2(b).

²⁶³ NER 6A.6.2(f).

²⁶⁴ NER 6A.6.2(c).

The AER stated in the Guideline, and continues to maintain (notwithstanding the recent decisions of the Tribunal to the contrary²⁶⁵) that the BEE referred to in the ARORO is a “*pure play, regulated energy network business operating within Australia*”.²⁶⁶

The Relevance of the BEE to any Transition

Prior to the Tribunal’s decision in *Ausgrid*, the assumption that the BEE was a regulated energy network business formed a key part of the AER’s reasoning for applying a full transition from the “on-the-day” approach to the trailing average approach. In the Explanatory Statement for the Guideline, the AER stated that one of the considerations in applying the transition was “*that the benchmark efficient firm is likely to need a transition in moving from the current ‘on the day’ approach to the trailing average approach*”.²⁶⁷

The AER also said (emphasis added):

“In section 7.3.3 we considered what would constitute the efficient debt financing practices of the benchmark efficient entity under the current ‘on the day’ approach. We considered it likely that holding a debt portfolio with staggered maturity dates and using swaps to hedge interest rate exposure for the duration of a regulatory control period would constitute such an efficient debt financing practice. Further, we consider that holding a (fixed rate) debt portfolio with staggered maturity dates to align its return on debt with the regulatory return on debt allowance is likely to be an efficient debt financing practice of the benchmark efficient entity under the trailing average portfolio approach. That is, it is likely that the benchmark efficient entity would need to unwind its hedging contracts in moving from the current ‘on the day’ approach to the trailing average portfolio approach. Therefore, if transition is immediate (that is, if there is no transitional arrangement), the benchmark efficient entity is likely then to face costs or practical difficulties, as:

- *It would have likely entered hedging contracts to manage its interest rate risk in the past.*
- *It would be impossible for it ‘to go back and lock in rates that applied some time ago’.*
- *Without transition there would be, therefore, a mismatch between the expected return on debt of the benchmark efficient entity and the regulatory return on debt allowance set according to the trailing average portfolio approach. This mismatch could potentially be significant.*

*A gradual transition, on the other hand, can take into account the efficient financing practices under the current ‘on the day’ approach. It can also address the need for the benchmark efficient entity to unwind its historical hedging contracts...”*²⁶⁸

The rationale, therefore, in the Guideline for the transition was that the BEE had previously adopted efficient financing practices in response to the previous “on-the-day” approach (such as entering into hedging contracts) that would need to be unwound in moving to the trailing average approach. This rationale, of course, is only valid if the BEE is assumed to be a regulated entity that structured its debt financing practices to meet the requirements of the previous method of regulation. An unregulated BEE would have engaged in efficient financing practices unaffected by the AER’s previous regulatory practice.

In *Ausgrid*, the Tribunal considered this rationale for the AER’s proposed transition (emphasis added):

“Underlying the adoption of the trailing average approach, commonly accepted, is the fact that companies usually structure their debt by refinancing a portion of their debt each year at fixed rates prevailing at the time of renewal. At any given time, a company will therefore have a portfolio of fixed rate debt entered into in different years in the past and at interest rates

²⁶⁵ *Ausgrid et al.*

²⁶⁶ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, see pp. 24, 33, 256 and 257.

²⁶⁷ Explanatory Statement – Rate of Return Guideline, p. 120.

²⁶⁸ Explanatory Statement – Rate of Return Guideline, pp. 121-122.

prevailing at the date of entry into each facility referred to in the submissions as a staggered portfolio of fixed rate debt. As older facilities come up for renewal, they are replaced by new debt at current rates.

One consequence of the previous on-the-day methodology was that **regulated businesses** took steps to partially align one component of their cost of debt (the risk free rate component) to the regulatory allowance for that component under the on-the-day approach by entering into floating rate debt rather than fixed rate debt (or alternatively by entering into fixed rate debt and converting this to floating rate debt using fixed-to-floating interest rate swaps), and then entering into hedge transactions during the averaging period to fix part of their cost of debt at the prevailing rate. It is common ground that businesses could not hedge the DRP component of their debt. It is also clear that some DNSPs did not enter into such hedge transactions. That included each of the Networks NSW businesses, and (for different reasons) ActewAGL.

The AER's transitional approach, adopted in each of the Final Decisions under review and apparently in all regulatory decisions for the current regulatory period, was based on a regulated entity as the BEE which (it considered) would have a portfolio of floating rate debt that, had the on-the-day approach continued, it would have swapped into fixed rate debt during the relevant averaging period. Consequently, the BEE would have unwound its hedging contracts in moving from the current on-the-day approach to the trailing average portfolio approach.²⁶⁹

The Tribunal went on to find that the assumption underlying the AER's rationale for the transition was incorrect, and the BEE referred to in the ARORO should be considered to be an unregulated entity (emphasis added):

“It is the Tribunal's view that the BEE referred to in the RoR Objective is not a regulated entity. It need not necessarily be the one entity for the purpose of all regulatory decision-making in a particular regulatory period for all regulated service providers.

The general underlying purpose of economic regulation of regulated service providers under the NEL, the NGL and the Rules is canvassed earlier in these reasons. It is common ground. It is to secure, so far as practicable, the NEO and the NGO in accordance with the RPP. To achieve that, the AER is required to make its regulatory determinations in relation to a regulated service provider, in an environment where there is no competition for the services it provides, but broadly speaking as if the relevant provider were operating in a competitive environment.

As the AER said, its decision on this topic (and on other topics) is to be made by reference to the efficient financing costs of a BEE, rather than the actual financing costs of the particular regulated service provider. Once those costs or allowances are fixed, they provide the economic incentive to the provider to operate more efficiently.

The relevant rules support that overall approach, rather than (as would be the effect of the AER's contention) support the measurement of performance and the fixing of the return on capital (including the return on debt) by reference to a regulated efficient entity.

The particular features of the NER (and the equivalent provisions in the NGR) which, in the view of the Tribunal, are significant are:

- (a) the definition of the RoR Objective in r 6.5.2(c);
- (b) the reference to the return required by debt investors in r 6.5.2(i);
- (c) the interrelationship between the return on equity and the return on debt under r 6.5.2(j)(2);
- (d) the reference to incentives in r 6.5.2(k)(3); and
- (e) the reference to the impacts on a BEE that could arise as a result of changing the methodology used to estimate the return on debt from one regulatory control period to another in r 6.5.2(k)(4).

It is appropriate to address those provisions in turn.

²⁶⁹ Ausgrid at [865]-[867].

The RoR Objective directs the allowed rate of return on capital for the relevant DNSP to be applied to its regulatory asset base: r 6.5.2(a) and (b). When r 6.5.2(c) then defines the RoR Objective, it is directed to determining a rate of return for a DNSP by reference to (what the AER determines as) the relevant BEE. The relevant BEE is to be used to determine efficient financing costs to be allowed for. The BEE is to have a similar degree of risk as that which applies to the relevant DNSP in respect of the provision of standard control services.

The BEE, in the view of the Tribunal, is likely to refer to the hypothetical efficient competitor in a competitive market for those services. Such a BEE is not a regulated competitor, because the regulation is imposed as a proxy for the hypothetical unregulated competitor. Otherwise, the starting point would be a regulated competitor in a hypothetically regulated market. That would not be consistent with the policy underlying the purpose of the NEL and the NGL in relation to the fixing of terms on which monopoly providers may operate. Indeed, the concept of a regulated efficient entity as the base comparator would divert the AER from the role of fixing the terms for supply of services on a proxy basis compared to those likely to obtain in a competitive market, and focus its attention on some different and unidentified regulated market.

It may be observed that the AER, both in the RoR Guideline and in the relevant Final Decisions, imposed the trailing average methodology as that most likely to represent the proxy for the cost of debt for a supplier of the services in a competitive market.²⁷⁰

AusNet Services' proposal is consistent with the Tribunal's finding that the BEE referred to in the ARORO must be an unregulated entity, with a similar degree of risk as that which applies to the service provider in respect of the provision of prescribed transmission services. As to the latter point, the Tribunal noted in *Ausgrid*:

Secondly, it is necessary to focus on the characteristic that the BEE must have: a similar degree of risk to that of the relevant DNSP. The relevant DNSP is the DNSP for which the BEE is being determined by the AER. Once it is accepted that different DNSPs have in fact different degrees of risk... and so may have different efficient financing cost structures, it leads to the conclusion that there will not be an identical BEE for all DNSPs.²⁷¹

It follows that the BEE, in the current and previous regulatory control periods, would not have structured its debt financing strategy to respond to the AER's previous "on-the-day" approach (as an unregulated entity in the competitive market is not affected by the AER's regulatory approach).

Rather, the unregulated entity would have structured its debt financing strategy in such a way that mirrors the trailing average approach adopted by AusNet Services (and, subject to the need for a transition, accepted by the AER). This is because the unregulated BEE, operating in a workably competitive market, is likely to hold a staggered long term (i.e. approximately 10 year term) debt portfolio.²⁷² So much appears not to be disputed by the AER, given its previous comments on the efficient debt financing practices of the (regulated) BEE.²⁷³

In imposing the transition, the AER relies upon NER 6A.6.2(k)(4), which provides that, where estimating the return on debt, "*regard must be had to... any impacts (including in relation to the costs of servicing debt across regulatory control periods) on a benchmark efficient entity referred to in the allowed rate of return objective that could arise as a result of changing the methodology that is used to estimate the return on debt from one regulatory control period to the next*".

In *Ausgrid*, the Tribunal found (in relation to the equivalent rule for distribution service providers) that:

"...the compulsory consideration in r 6.5.2(k)(4) of the NER:

²⁷⁰ *Ausgrid* at [907]-[915].

²⁷¹ *Ausgrid* at [916].

²⁷² Appendix 6C – CEG, *The AER's current interpretation of the ARORO*, September 2016, section 9.

²⁷³ See, for example, Explanatory Statement – Rate of Return Guideline, pp. 102-109.

- (1) starts with the efficient financing costs of a BEE as described above (ie not a regulated BEE);
- (2) in the case of a changed methodology to estimate the return on debt, determines whether the BEE would suffer any impacts as a result of the changed methodology; and
- (3) if so, have regard to those impacts in deciding on the transition process to the new methodology.

*The starting point is not the actual financing costs of the relevant DNSP, but the efficient financing costs having regard to its degree of risk...*²⁷⁴

Applying the Tribunal's reasoning above:

- 1) The efficient financing costs of a BEE with the same degree of as risk as that which applies to AusNet Services in respect of the provision of prescribed transmission services are the financing costs of an unregulated entity with a staggered portfolio of debt;
- 2) The "changed methodology" being applied by the AER is a move to a trailing average approach to estimating the cost of debt, which is largely equivalent to the financing strategy already applied by the BEE; and
- 3) As a result, there is no impact on the BEE in moving to the "new methodology", and
- 4) As a result, NER 6A.6.2(k)(4) has no work to do in the current circumstances, and there is no need for any transition and the imposition of a transition would not contribute to, but rather would detract from, the achievement of the ARORO.

AusNet Services notes, consistent with the Tribunal's reasoning above (and as conceded previously by the AER)²⁷⁵, that NER 6A.6.2(k)(4) is directed to any impacts (of a change in methodology) on the BEE, not on the impacts on the individual service provider.

The "Hybrid Transition" Alternative

In its Draft Decision, the AER refers to "several proposed transition paths" it has considered, including:

- A full transition of both the base rate and DRP components of the return on debt over 10 years, as adopted by the AER in its Draft Decision;
- No transition (or an immediate move) to a trailing average, as adopted now by AusNet Services;
- A hybrid transition of just the base rate component of the return on debt over 10 years; and
- A hybrid transition under partial hedging of just a portion (representing the efficient portion of the base rate hedged by the business) of the base rate component of the return on debt over 10 years.²⁷⁶

It is accepted by the AER that businesses (and the BEE) cannot hedge, and have not hedged, the DRP component of the return on debt.²⁷⁷ The AER has also previously accepted (based on advice from Chairmont, who recommended the adoption of the hybrid transition²⁷⁸) that the hybrid transition would "provide a good match" between the allowed return on debt and the efficient financing costs of a BEE (being the focus of the ARORO).²⁷⁹

²⁷⁴ Ausgrid at [933]-[934].

²⁷⁵ See Ausgrid at [930].

²⁷⁶ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 99-100.

²⁷⁷ Explanatory Statement – Rate of Return Guideline, p. 105.

²⁷⁸ Chairmont, *Financing practices under regulation: Past and transitional*, October 2015.

²⁷⁹ See, for example, SAPN, *Final Decision*, Attachment 3-165.

There is therefore no need to transition the DRP component of the return on debt in any change of methodology. As set out above, the AER's original justification for a transition was the fact or assumption that the BEE "*would have likely entered hedging contracts to manage its interest rate risk in the past*",²⁸⁰ which hedging can only have related to the base rate component of the return on debt.

If a transition to the trailing average approach is deemed to be appropriate, AusNet Services submits that that the hybrid transition should be applied in preference to the full transition applied by the AER.

AusNet Services notes that a hybrid transition was proposed by SAPN, and rejected by the AER in favour of a full transition, in its distribution determination for 2015/16 to 2019/20. SAPN applied to the Tribunal for, and was granted leave to pursue, merits review of the AER's decision, including in relation to the transition.²⁸¹ The Tribunal heard that application for review in August 2016 and has reserved its decision.

The Draft Decision

In the Draft Decision, the AER concludes that, in the context of a change to a trailing average approach to estimating the return on debt, only a full transition would contribute to the achievement of the ARORO²⁸² and that, the only other approach that would satisfy the ARORO is the maintenance of the existing "on-the-day" approach.²⁸³

However, the AER has moved away from its previous rationale for the imposition of the transition (found to be in error by the Tribunal in *Ausgrid*). The AER now states that, even if the BEE was unregulated, it does not consider this would affect its conclusions in respect of the return on debt.²⁸⁴

In the Draft Decision, the AER states that the ARORO requires the allowed rate of return to compensate investors in an *ex-ante* sense and to minimise the long run costs of capital, and that *ex-ante* efficient compensation should result in the *ex-ante* allowed return on capital cash flows having a present value equal to the present value of the *ex-ante* efficient cost of capital cash flows required to finance the RAB – that is, the AER asserts that the allowed return on and of capital cash flows should have a present value equal to the statutory value of the RAB (referred to by the AER as the "*zero NPV investment condition*").²⁸⁵

The AER asserts that any change in debt estimation methodologies must be "*revenue-neutral (in a present value sense)*" and that an immediate transition from the on-the-day to the trailing average approach could only satisfy this criterion by chance (i.e. if the current cost of debt in the market equalled the average cost of debt over the past nine years).²⁸⁶

In AusNet Services' view, the AER's arguments in this respect are flawed and do not support its position. These issues are more fully discussed in the attached expert report by CEG.²⁸⁷ In brief:

- The AER's reasoning effectively supplants the ARORO with a (new) specific form of its "*zero NPV investment condition*" criterion, different to the NPV=0 criterion applied by the AER (and supported by its experts) in previous decisions. The AER provides no explanation or justification for its significant change in interpretation.

²⁸⁰ Explanatory Statement – Rate of Return Guideline, p. 121.

²⁸¹ ACT 11 of 2015, heard in August 2016, decision reserved.

²⁸² AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 93-95.

²⁸³ *Ibid.*

²⁸⁴ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 257.

²⁸⁵ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 95.

²⁸⁶ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 97.

²⁸⁷ Appendix 6C – CEG, *The AER's current interpretation of the ARORO*, September 2016, sections 2 to 8.

- The AER’s new interpretation of the “*zero NPV investment condition*” criterion assumes that “*efficient financing costs*” (as referred to in the ARORO) are not related to how a business would actually finance itself. Rather, the AER assumes that “*efficient financing costs*” are a hypothetical/conceptual concept not determined by reference to actual financing practices of, and associated costs incurred by, a BEE.
- The AER’s new interpretation of the “*zero NPV investment condition*” criterion also effectively assumes that the BEE is an entity that has not financed any assets in the past but, instead, is interested in purchasing the assets using finance available at current market rates. It looks to the perspective of a potential investor valuing access to the BEE’s expected future revenues net of efficient operating expenditures and taxes *but before efficiently incurred debt financing costs*.
- However, AusNet Services submits the correct interpretation of the ARORO does not allow the AER to ignore efficiently incurred debt financing costs when interpreting the ARORO. The AER’s new interpretation, in which (both past and future) efficient actual debt management practices are irrelevant, is not consistent with the ARORO, is counterintuitive and the AER’s own reasoning is confused and inconsistent as a result.
- In addition, the AER’s reasons for relying on prevailing rates as the basis for its new “*zero NPV investment condition*” criterion are also misplaced.
- The AER’s “*mathematic description*” as to why only a full transition satisfies the criterion is also flawed, including because it makes so-called simplifying assumptions (inconsistent with the AER’s other determinations) and does not hold if those unrealistic assumptions are not made.
- Further, the AER’s reasoning unnecessarily introduces a non-existent tension between the ARORO and the NEO (due to the AER’s failure to consider actual debt financing practices when interpreting the ARORO).
- The adoption of a trailing average approach is consistent with the proper interpretation of the ARORO, as is the adoption of a 10 year term for the cost of debt.

Return to the “on-the-day” approach

The AER also states that, in the absence of a full transition to the trailing average approach, the change in methodology would not be justified and would not achieve the ARORO. The AER goes on to say that, in the absence of a transition, it would maintain the “on-the-day” approach to estimating the return on debt.²⁸⁸

AusNet Services disagrees with this approach by the AER.

Firstly, for the reasons set out above, AusNet Services has adopted the Tribunal’s position that a transition is not required in order to achieve the ARORO and, in fact, the ARORO is compromised, rather than advanced, by the imposition of a full transition as proposed by the AER. Rather, the ARORO requires the return on debt to reflect the efficient financing costs of the BEE (which has financed assets in the past), which costs are appropriately estimated by a trailing average approach. The transition can only be, and is not for the reasons set out above, justified under NER 6A.6.2(k)(4).

Secondly, for the reasons set out in CEG’s attached report,²⁸⁹ the AER’s “*zero NPV investment condition*” and mathematical justification for the conclusion that the “on-the-day” approach meets the ARORO (or the AER’s new interpretation of the ARORO) is flawed.

Thirdly, the AER has previously acknowledged that the trailing average (as compared to the “on-the-day” approach) “*more closely aligns with the efficient debt financing practices of regulated*

²⁸⁸ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 93 and 98.

²⁸⁹ CEG, *The AER’s current interpretation of the ARORO*, September 2016.

businesses and means that prices are likely to be less volatile over time".²⁹⁰ The AER's change to this methodology was also described as "a major change in the regulatory framework... arrived at... through an extensive consultation process and analysis".²⁹¹

The trailing average approach is clearly better aligned with the actual financing practices of the BEE (whether regulated or unregulated)²⁹² than the "on-the-day" approach and therefore a better estimation of the efficient debt financing costs of the BEE.

As noted above, where there are two or more possible decisions that will or will be likely to contribute to the achievement of the NEO, section 16(1)(d) of the NEL requires the AER to make the decision that will or is likely to contribute to the NEO to the greatest degree. AusNet Services submits that the AER would not be acting in accordance with the NEO in returning to the "on-the-day" approach in circumstances where the trailing average approach better contributes to the NEO and to the achievement of the ARORO.

If the AER were to revert to the on-the-day approach in its Final Decision without providing AusNet Services with notice prior to its actual debt averaging period, there would be a detrimental financial impact resulting from procedural uncertainty. This would constitute a serious breach of the requirements of procedural fairness. The financing arrangements made by AusNet Services for its first averaging period will be consistent with the application of a trailing average approach to estimating the cost of debt. Were the on-the-day approach known to be continuing, different financial arrangements would have been made. Financial compensation must be provided for any unforeseen shift in the AER's approach.

Revised Revenue Proposal – Debt Transition

For the reasons set out above, AusNet Services' Revised Revenue Proposal is based upon the immediate adoption of the trailing average approach (with no transition).

In the alternative, if a transition is justified, AusNet Services submits that the correct transition is a hybrid transition.

6.6.7 Credit Rating

In its Draft Decision, the AER continues to adopt a BBB+ benchmark credit rating to estimate the return on debt.²⁹³ This is consistent with the Guideline.

AusNet Services considers that adopting a BBB+ credit rating assumption is highly conservative, in the sense that it is likely to understate the degree of risk faced by AusNet Services in the supply of prescribed transmission services.

The empirical evidence referred to by AER in support of a BBB+ rating, when correctly applied and interpreted, supports a BBB to BBB+ rating. As noted by the AER, the median credit rating over the past ten years (2006-2015) across all businesses in the AER's sample is BBB to BBB+.²⁹⁴ A credit rating of BBB to BBB+ is also consistent with the advice from Professor Lally to the AER.²⁹⁵ However, it is a departure from the Guideline.

Adoption of a BBB+ credit rating assumption is likely to lead to under-estimation of the efficient financing costs of a BEE facing a similar degree of risk as that which applies in to AusNet Services in respect of the supply of prescribed transmission. In short, AusNet Services

²⁹⁰ Explanatory Statement – Rate of Return Guideline, p. 12.

²⁹¹ Explanatory Statement – Rate of Return Guideline, p. 101.

²⁹² Appendix 6C – CEG *The AER's current interpretation of the ARORO*, September 2016, section 9.

²⁹³ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 106.

²⁹⁴ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 312, Table 3-39.

²⁹⁵ Lally, *Implementation issues for the cost of debt*, November 2014, p. 4.

may be inadequately compensated for efficient financing costs, creating a risk that AusNet Services cannot attract the capital required to undertake efficient investment.

AusNet Services notes that if a broad BBB band data series is available and is used to estimate the return on debt, then whether a BBB or BBB+ credit rating assumption is adopted is of little practical consequence. However if the AER were to start using a BBB+-specific data series (should one become available), it is likely that this would lead to under-estimation of the efficient financing costs of a BEE facing a similar degree of risk as that which applies to AusNet Services in respect of the supply of prescribed transmission services. This is because a BBB+-specific data series is likely to overestimate the cost of debt for businesses with a risk profile in the BBB to BBB+ band.

For the same reasons, given that the evidence supports a credit rating of BBB to BBB+, use of a broad BBB band data series is entirely appropriate.

6.6.8 Term

AusNet Services notes that the AER has accepted its proposal to adopt a 10 year benchmark term in estimating the return on debt.

6.6.9 Implementation – Debt Data Sources

Revenue Proposal

In its Revenue Proposal, AusNet Services proposed that the third party independent data source used for calculating the trailing average return on debt be solely the 10-year curve published by the RBA. Supported by the opinion of CEG, AusNet Services submitted that the Bloomberg 10 year curve should not be used at this time, including because:

- Bloomberg's new 10 year BVAL had been significantly understating the yields of recent debt issuances;
- Bloomberg itself made adjustments to its extrapolation methodology following observed discrepancies between one 10 year bond (issued by Asciano in May 2015) and the BVAL 10 year implied margin (which could not be entirely explained by a "new issue premium");
- There are key differences between Bloomberg's 10 year curve and the RBA's 10 year curve arising from the differing bond selection criteria, which results in Bloomberg using a more restrictive bond sample and no bonds with a term to maturity exceeding 7 years; and
- Bloomberg's 10 year figures are actually derived from extrapolating shorter term data, which underestimates the required returns for corporate debt.

Draft Decision

In its Draft Decision, the AER determined to apply a simple average of the Bloomberg and RBA curves on the basis that:

- Both curves have their unique strengths and weaknesses, but the AER is not satisfied that either is clearly superior to the other;
- Both curves require adjustments from their published form to make them fit-for-purpose, and the AER is not satisfied that either can be more simply or reliably adjusted to estimate the annual return on debt that the other;
- The AER's approach is consistent with expert advice from Dr Lally (from 2014) that it adopt a simple average of the BVAL and RBA curves, subject to the necessary adjustments to each curve;
- The two curves have regularly produced materially different results at particular points in time. Both curves have their strengths and shortcomings, but it is not clear to the AER that one approach is clearly superior to the other. When the curves depart, the AER considers it

is not easily discernible which curve produces estimates that better reflect the efficient financing costs of a BEE. The BVAL curve has produced estimates both higher than, lower than, and similar to, the RBA curve, so there is no clear indication that one curve produces systematically higher or lower estimates than the other;

- The AER’s approach is consistent with the Tribunal’s decision in Application by ActewAGL Distribution [2010] ACompT 4; and
- The AER’s approach will reduce the likely price shock if either curve becomes unavailable or produces erroneous estimates during the period.²⁹⁶

The AER also refers to eleven “*points of distinction*” discussed by Dr Lally in his 2014 report, of which:

- Three are said to favour the use of the BVAL curve (after April 2015);
- Two are said to favour the use of the RBA curve (after April 2015);
- Five are said to not favour one curve over the other; and
- One is said to be irrelevant.²⁹⁷

The AER also refers to the Tribunal’s decision in relation to the NSW electricity determinations which upheld its approach to apply a 50:50 weighting to each of the RBA and Bloomberg curves given the evidence available to it at the time.

The AER responded to the concerns raised by AusNet Services about the performance of the Bloomberg curve. It concluded that:

- AusNet Services’ concerns relate to a lack of available bonds in the BVAL curve beyond 7 years term to maturity. This has already been considered by the AER and does not raise material new issues;
- While there is a correlative relationship between the Asciano bond and BVAL 10 year estimate, there is no clear evidence that the BVAL 10 year curve is not fit for purpose. CEG’s regression analysis is not persuasive and the AER has had limited time to consider this since it was submitted in March 2016.

AusNet Services’ response to these concerns is set out below.

Revised Revenue Proposal

AusNet Services does not accept the Draft Decision to apply a 50:50 weighting of the Bloomberg (BVAL) and RBA curves to estimate the cost of debt. Instead, it considers that the RBA curve should be relied upon exclusively.

Overview

NER 6A.6.2(h) and (j)(1) together require the allowed return on debt to reflect that which would be required by debt investors in a benchmark efficient entity for a regulatory year.

AusNet Services has expressed concerns throughout both its recent distribution review process and this transmission review that the BVAL curve does **not** reflect the return a debt investor in a benchmark efficient entity requires.

Therefore, the AER’s decision to place reliance on the BVAL curve, even as part of an average, does not achieve the ARORO. As a more reliable curve is available (being the BBB 10 year curve published by the RBA), the use of the RBA curve alone will better achieve the ARORO.

²⁹⁶ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 112-113.

²⁹⁷ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp. 114-115

The AER's assessment of curves is only carried out once, at the beginning of each regulatory period. It would be incorrect to assume that, if one curve is performing poorly at the beginning of a regulatory period, a superior result will be achieved by applying an average of a currently poor performing curve and a currently well-performing curve. Instead, a superior and reliable outcome is more likely if only the well-performing (in terms of providing more accurate estimates) curve were relied upon.

Concerns about the Performance of the BVAL Curve

AusNet Services' key concerns about the performance of the BVAL curve are:

- Its reliance on a very small sample of bonds. This has been acknowledged by Bloomberg, which has confirmed that there is a 'real dearth in market observations beyond 5-7 years in the BBB corporate curve'.²⁹⁸ One factor which greatly limits the potential sample size of the BVAL curve is Bloomberg's exclusion of debt issued overseas by Australian entities, which accounts for approximately 80% of total debt issued. Therefore, the movements in the market faced by a debt investor in a benchmark efficient entity cannot be not fully reflected in the movements in the BVAL curve.
- The observed lag between the issuance of a bond meeting BVAL's selection criteria and any adjustment made to the BVAL curve to reflect this issuance. This lag indicates that there are periods where BVAL yields do not reflect prevailing market conditions.

In recent months these concerns have led to mismatches between the BVAL curve and the return required by debt investors in a benchmark efficient entity, as discussed below.

Between May 2015 and 28 July 2016, the Asciano bond was the only bond in the 10 year BVAL curve's sample with a term to maturity exceeding six years. Over this period, the BVAL curve placed an inappropriately high weighting on this bond. In AusNet Services' debt averaging period for the distribution network's Final Decision, a 91% correlation between changes in the BVAL 10 year spread and changes in the Asciano bond spread, was observed.

This was particularly problematic because Asciano was the subject of takeover activity over this period. The influence of takeover activity on the Asciano bond's yields reflects firm-specific factors that would have no relevance to the benchmark efficient firm, and is therefore not relevant to setting the return on debt faced by debt investors in a benchmark efficient entity.

As set out in AusNet Services' 24 March 2016 submission to the AER and supporting CEG memo (Appendix 6E – CEG, Review of AER Position on Curve Selection), over AusNet Services' distribution businesses' averaging period, all bonds included in the RBA's sample with tenors between 8 and 12 years (excluding the Asciano bond) exhibited very different movements in yields than the Asciano bond. At this time, there was a high degree of financial market volatility, which is consistent with the finding that there was a general rise in DRPs across the market. The Asciano bond was an outlier over this time period as its DRP did not increase by an amount commensurate with the general market. As the BVAL curve moved in (close to) lock step with the Asciano bond's yields, the BVAL curve did not reflect general market movements.

Superiority of RBA curve

As a more superior curve is available, being the RBA curve, and as the other curves distort the effect of applying the RBA curve, the ARORO can be best achieved by relying on this curve alone. Incorporating the other curves will detract from the achievement of the ARORO.

AusNet Services obtained advice from CEG on desirable characteristics of curve selection. CEG identified the five criteria below as those most relevant to estimating the cost of debt for a BEE:

- (a) Dataset that best matches the characteristics of debt issued by a BEE;
- (b) A large dataset that is consistent with criterion (a);

²⁹⁸ Email from Bloomberg to AusNet Services, 27 January 2016. Submitted to the AER on 4 February 2016.

- (c) Derived from a transparent and robust method;
- (d) Regularly published by an independent reputable organisation; and
- (e) Track record of accuracy.²⁹⁹

As described in CEG's report, the RBA curve fulfils all five of the criteria. This supports AusNet Services' proposal to rely exclusively on the RBA curve.

The Bloomberg and Reuters curves only fulfil criteria (d), and fail to satisfy each of the other criteria for the reasons identified in CEG's report and in the Table below.

Table 6.4: Assessment of Third Party Data Sources against Criteria

Criterion	Bloomberg	Reuters	RBA
(a) Dataset that best matches the characteristics of debts issued by a BEE	✘ Does not include bonds issued in foreign currency or with optionality features	✘ Does not include bonds issued in foreign currency or with optionality features	✔ Includes bonds issued in foreign currency and with optionality features
(b) A large dataset that is consistent with criterion (a)	✘ At times, only a single bond with a term to maturity beyond 7 years has been included in the sample	✘ At times, only a single bond with a term to maturity beyond 7 years has been included in the sample	✔ A sample size exceeding 10 bonds with terms to maturity beyond 7 years has consistently been observed
(c) Derived from a transparent and robust method	✘ The curve-fitting methodology is proprietary and so it is not possible to assess it	✘ The curve-fitting methodology is proprietary and so it is not possible to assess it	✔ Transparently describes its sample selection and estimation processes
(d) Regularly published by an independent reputable organisation	✔	✔	✔
(e) Track record of accuracy	✘ AusNet Services has submitted analysis to illustrate recent inaccuracies of the BVAL curve given its reliance on a very small number of bonds	✘ More difficult to assess as has only been available for a short period of time	✔ Generally considered to have been the most accurate data series over a historical period, including the GFC

Note: Further discussion is included in CEG – Criteria for assessing fair value curves, January 2016

By incorporating the Bloomberg and/ or Reuters curves in the cost of debt estimate, the application of the curves becomes distorted in a manner which undermines the objective of this exercise, which is to reflect the characteristics of a benchmark efficient entity, and will undermine the achievement of the ARORO.

²⁹⁹ CEG, Criteria for assessing fair value curves, January 2016.

Moreover, AusNet Services considers that the AER's reliance on the BVAL curve but not the Reuter's curve is even more unjustified. While our strongly held contention is that the BVAL curve should be given no weight at all, if it were to be relied upon, there is no reason why the Reuters curve should not be given an equal weight. While AusNet Services did not propose the application of the Reuters curve in its Revenue Proposal (as it was unaware of its existence at the time), the AER and AusNet Services have been aware of the Reuters curve since late 2015/early 2016 and have now had an opportunity to consider its merits.

We recognise that the AER and Lally have carried out an assessment of the BVAL and RBA curves based on certain criteria and found neither of these curves to be superior. While we acknowledge the matters raised in this assessment, it does not include a criteria that distinguishes between the curves when one relies on a single, or inappropriately small number of bonds. Therefore there is no safeguard for the situation that has occurred since mid- to late-2015, whereby the BVAL curve exclusively relies upon a single bond.

Response to Draft Decision analysis

The AER raised the concerns below about AusNet Services' submissions that the BVAL curve is not fit-for-purpose. These concerns were also raised in the AER's Final Decision for AusNet Services' electricity distribution network.

1. Criticisms of CEG's Regression Analysis

The AER criticised CEGs regression analysis on the basis that:

- It had not included a variable for an underlying base rate component in its regressions. The AER considered that the inclusion of such a variable is important, because the swap curve is a key driver of pricing. The AER 'mirrored' CEG's approach and regressed the BVAL 10 year spread-to-swap against the swap rate, which produced a higher R^2 value (0.95) compared to CEG's regression (0.93). The AER considered this result might indicate a degree of multicollinearity within CEG's regression, which casts doubt over its results.
- AusNet Services submits that the AER's conclusions are problematic for the following reasons:
 - The purpose of CEG's regression analysis was to examine whether the Asciano bond received a relatively higher weighting compared to the rest of the bonds in the sample, due to it being the only long-dated bonds. There may be a number of other variables that are correlated with the spread to swap of the Asciano bond (e.g. takeover activity), but including other variables in the regression would not help achieve the purpose of the test.
 - By definition, multicollinearity cannot be present in CEG's regression as it contains only a single variable. Multicollinearity can only be present in regressions containing multiple explanatory variables.
 - The AER did not report its regression results – it is therefore not clear what it has regressed. A simple interpretation of its description is that it has regressed the BVAL 10-year spread-to-swap estimate against the 10 year swap rate. However, this results in an R^2 of just 0.33. Alternatively, it may have regressed the BVAL 10 year spread-to-swap estimate on both the 10 year swap yield and the Asciano spread-to-swap. This does result in an R^2 of 0.95.
 - AusNet Services encourages the AER to transparently report the full results of its regression that it has relied upon in its Draft Decision. If reported, these results would show that both regressors are statistically significant, but the effect of the Asciano spread-to-swap is almost one-for-one (coefficient of 0.95) and is much more statistically significant compared to the swap rate.
- The AER criticised CEG's analysis as it had not tested the impact of the base rate (either the risk free rate or swap rate) on the 10 year BVAL yields. However, as explained above, the

purpose of CEG's regression was not to comprehensively examine all variables that could impact the 10 year BVAL yields, but to examine the contribution of the Asciano bond.

- The AER criticised CEG's analysis as CEG had not explained methodological choices and assumptions in its regression, including its reasons for combining the spread to swaps for individual bonds into weekly averages and averaging all bond data within term-to-maturity bands. CEG has advised AusNet Services that:
 - The use of a weekly average is standard practice when measuring the relationship between assets especially where daily data is noisy. Indeed, the AER's consultant, Professor Olan Henry, applied weekly data in Henry (2014)³⁰⁰, upon which the AER relies in its estimation of equity beta; and
 - Averaging bond data within term-to-maturity bands is appropriate given the purpose of CEG's regression was to establish the weight given to the Asciano bond relative to other bonds in the sample. As the Asciano bond is the only long dated bond in the sample, it makes sense to disaggregate the bond sample by term-to-maturity.

2. Comparison of 7 to 10 year margins of the BVAL and RBA curves

The AER states that 'if the 10 year spread-to-swap estimate is disproportionately and downwardly impacted by an influential and unrepresentative bond, we would expect to see this reflected in the margin between 7 and 10 year spread-to-swap estimates.'³⁰¹

However, this premise is flawed because it ignores the level of the whole curve. That is, the BVAL 7 year yields could also be biased downwards, in which case a comparison between the BVAL 7 and 10 year spreads-to-swaps will not lead to meaningful information regarding whether the BVAL 10 year estimate is biased. As all BVAL yield curves exclude debt issued overseas (which does not reflect the financing practices of a benchmark efficient entity), they cannot be assumed to properly reflect the financing practices of a benchmark efficient entity.

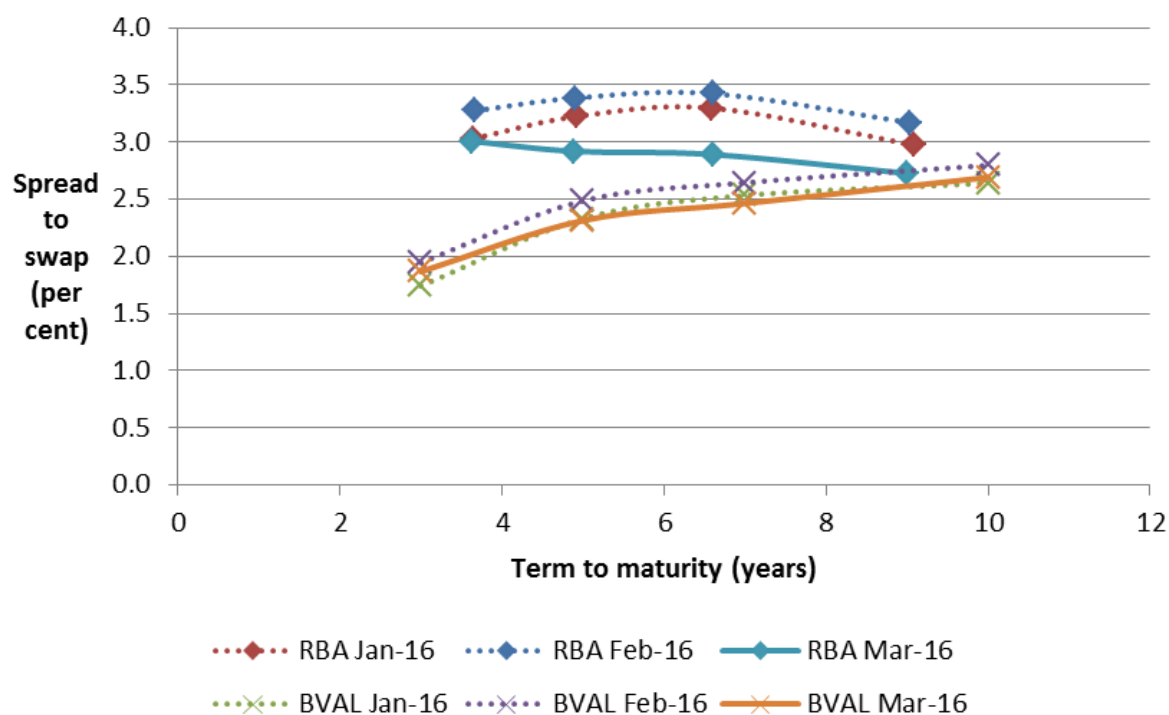
3. Representativeness of the Asciano bond

The AER considered that the Asciano bond's yields may have performed differently compared to the bonds CEG included in its comparison of yield movements for other longer-term bonds, all of which were issued in Europe or the US, due to the different circumstances present in these different markets. It also considered that the spread-to-swap profile across the entire term spectrum of the RBA curve appeared more 'typical' compared to that across the BVAL curve, as shown in the Figure below.

³⁰⁰ Henry 2014, Estimating beta: An Update.

³⁰¹ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 299.

Figure 6.6: Spread-to-swap Profile for Published Curves in 2016



Source: AER, AusNet Services Draft Decision, July 2016: Attachment 3 – Rate of Return, p. 300.

The bonds CEG included in its comparison were the only other long-dated bonds included in the RBA curve at the time. This was because there were no other AUD-denominated bonds with a term to maturity exceeding 8 years available at the time.

The relevant question is whether the movements in the yield of the Asciano bond, rather than the other bonds included in CEG's sample, are representative of the benchmark efficient entity. If a benchmark efficient entity issues debt in foreign markets (which it does), it follows that the benchmark efficient entity would be subject to the movements of bonds across these different markets.

The differences in the spread-to-swap at different terms to maturity in January to March 2016 reflect the bond data available at the time. Notably the RBA curve is currently exhibiting an upward sloping term structure, which the AER would deem to be more 'typical'. However, the Draft Decision includes data from March 2016, rather than the most recently available data.

Limited conclusions can be drawn about the BVAL curve reflecting a more 'typical' upward sloping yield curve. The fact that the RBA's yield curve has been observed to be downward sloping during some periods in 2015 and 2016 has not been of material concern to the AER as it has applied a 10 year RBA estimate, including a negative extrapolation adjustment based on a downwards slope between 7 and 10 years, in its recent decisions (including AusNet Services' distribution network's Final Decision).

New Developments – Inclusion of Jemena and Mirvac Bonds

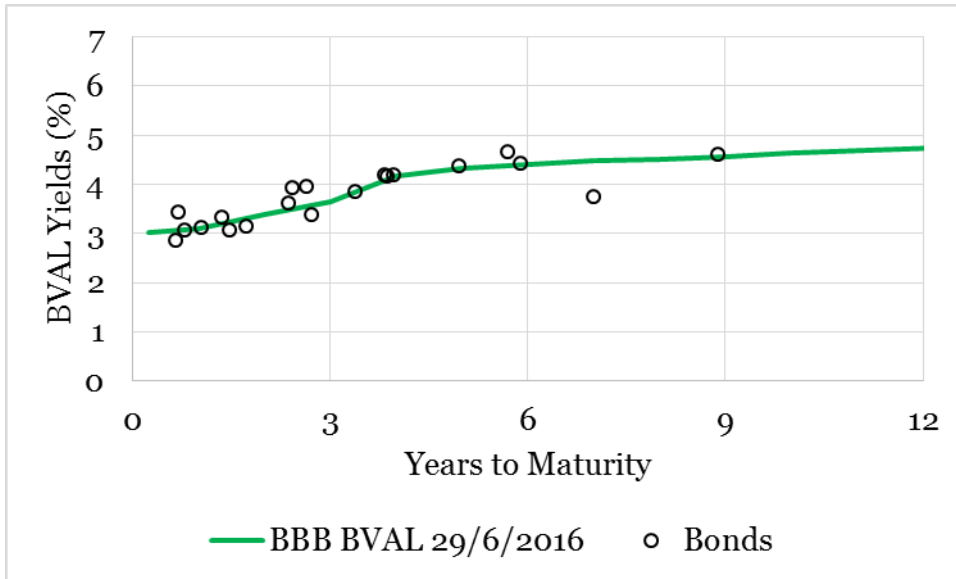
AusNet Services engaged CEG to provide an updated opinion regarding whether the BVAL curve currently reflects financing conditions faced by a benchmark efficient entity. This is provided as Appendix 6D – CEG, Criteria for assessing fair value curves: an update. The conclusions are summarised below.

Jemena Bond

A 7 year bond was issued by Jemena on 29 June 2016. This bond has been included in the BVAL 10 year sample, which now includes two bonds (Asciano and Jemena) with tenors above 6 years.

The yield of this bond is materially below the BVAL 10 year curve when this bond was issued, as shown in the Figure below.

Figure 6.7: BVAL curve and bond constituents, 29 June 2016

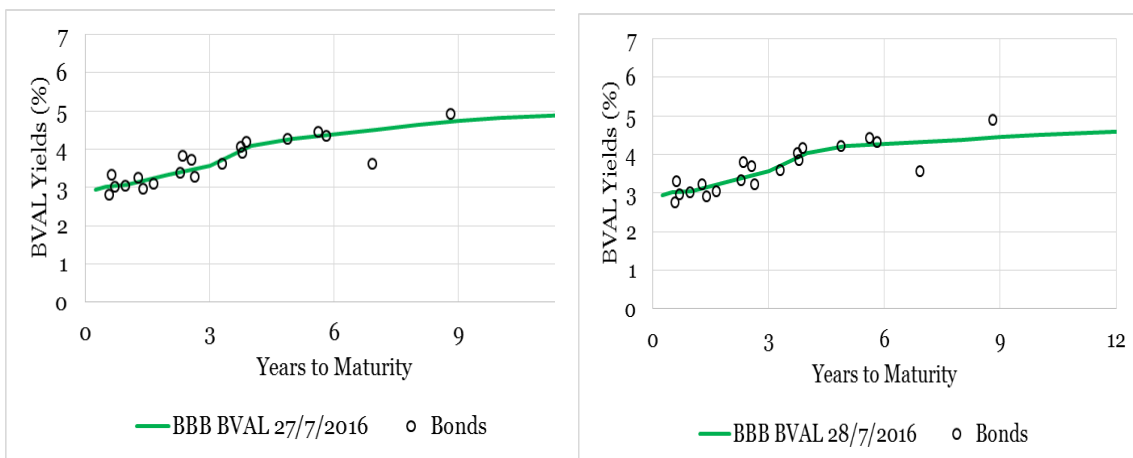


Source: CEG, Criteria for assessing fair value curves: an update, September 2016, Figure 3.3

The outlier appearance of the bond’s yield can be explained by the bond’s inconsistent credit ratings, being BBB+ by Standard and Poor’s, and A- by Moody’s. The credit rating is perhaps one reason why the yield of this bond is an outlier compared to other bonds. This has also led to differences in the treatment of this bond by the different data source providers. For example, Reuters includes this bond in its A band curve, while RBA includes it in its B band curve (however, as the RBA curve is based on a larger sample of bonds, the impact of any downwards bias is diluted).

The Jemena bond does not appear to have had an impact on the BVAL curve yields until a month after its issuance. CEG identifies a sharp reduction in the BVAL curve between 27 and 28 July 2016 (shown below), which could not be explained by the decline in the yield of any individual bond alone.

Figures 6.8 and 6.9: BVAL 10 year yields and JEN bond: 27 July and 28 July 2016



Source: CEG Criteria for assessing fair value curves: an update, September 2016, Figures 3.4 and 3.5

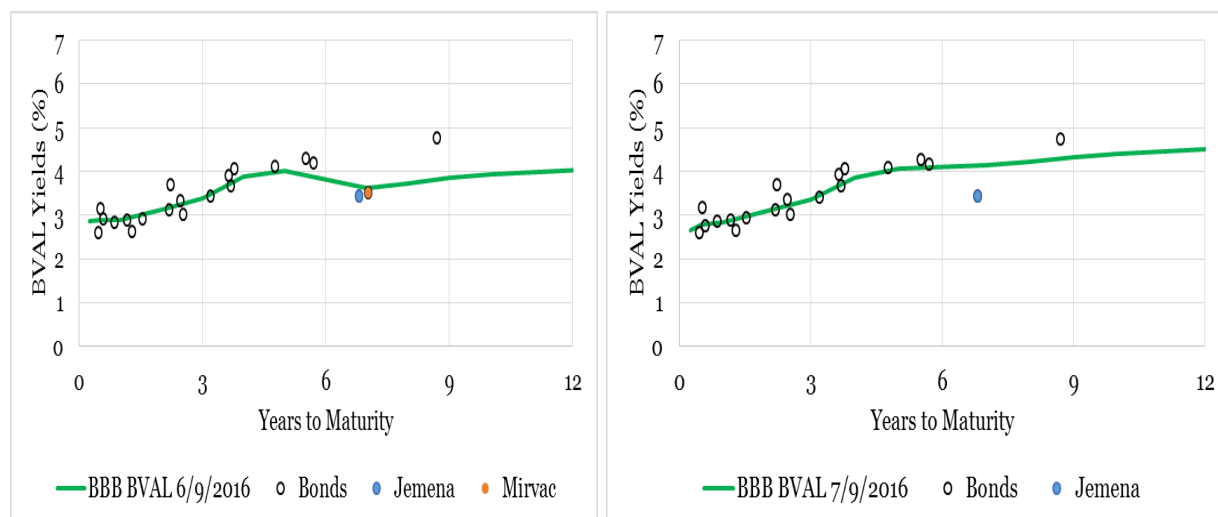
This further supports AusNet Services’ previous concerns about the lag between the issuance of a relevant bond and the bond’s yield being reflected in the BVAL curve. It is important that any

curve relied on by the AER provides a reliable estimate of prevailing market conditions. The BVAL 10 year curve cannot be relied upon to provide this.

Mirvac Bond

A 7 year bond issued by the Mirvac Group was briefly included in the BVAL sample from 1 to 6 September 2016. During this brief period, the BVAL yield curve exhibited an unusual kinked shape. However, upon the removal of the Mirvac bond from the sample, the BVAL yield curve exhibited a more typical shape. This is shown in the Figure below.

Figures 6.10 and 6.11: BVAL Spread-to-swap curve and bond constituents, 6 and 7 September 2016



Source: CEG, *Criteria for assessing fair value curves: an update, September 2016, Figures 3.8 and 3.9*

The fleeting inclusion of a particular bond in Bloomberg's sample is problematic because:

- Due to the severely limited sample size impacting the BVAL yields at 10 years, a single bond can have a material influence over reported yields. Where this bond's yields do not reflect the financing conditions faced by the benchmark efficient entity, it follows that the BVAL curve will not reflect the conditions faced by the benchmark efficient entity, and therefore should not be applied by the AER in its regulatory decisions.
- The inclusion and subsequent exclusion of a bond within a week casts doubt over the robustness of Bloomberg's application of its own sample selection criteria. This is worsened by the lack of transparency over these criteria. If this were to occur during a network's debt averaging period (which may be as short as 10 days) this would likely materially influence the debt allowance applied to the business.

Concluding comments

CEG concludes that the new evidence available strengthens its earlier conclusion that a 100% weighting on the RBA curve is the most appropriate as the RBA curve most closely reflects the cost of debt applicable to a benchmark efficient firm³⁰².

Application of 7 Year Bloomberg Curve as Contingency

In its Draft Decision, the AER states that, if it were not to adopt the BVAL 10 year estimate, it would adopt the 7 year BVAL estimate, consistent with its contingencies set out in Attachment 3, section J.2.4 of the Draft Decision.

AusNet Services submits that this would be inappropriate for the following reasons:

³⁰² Appendix 6D – CEG, *Criteria for Assessing Fair Value Curves: An Update, September 2016*.

- The AER's contingencies do not provide for an alternative curve to be relied upon where a 10 year yield curve is deemed to be unfit for purpose. The contingency for the case where Bloomberg reduces the maximum published BVAL term from 10 years is not an equivalent scenario, and it would not be appropriate for the AER to apply the same solution.
- Even if the AER's contingencies did lead to this solution, there would be a need to consider whether the extrapolated 7 year BVAL curve reflected the costs faced by debt investors in a benchmark efficient entity. Where a reliable 10 year yield curve exists, it is likely to be an inferior outcome to also apply weighting to an extrapolated 7 year yield curve. This is discussed further by CEG.³⁰³

Application of the Thompson Reuters Curve

As set out above, AusNet Services continues to assert that reliance on a single curve (RBA) is the only appropriate and correct application in all the current prevailing circumstances. However, should the AER insist on applying positive weight to Bloomberg (which AusNet Services asserts is a flawed approach), then it should also apply positive weight to the Thompson Reuters Curve, given they have many similar characteristics. The AER's Draft Decision flags that it has not had time to consider the Thompson Reuters Curve fully, but acknowledges its similarities with the BVAL curve.

The AER also considers that a 'proper period of consultation' is warranted before it can apply the Reuters curve in its decisions.³⁰⁴ However, the Reuter's curve was first brought to the AER's attention in early January 2016 by the Victorian distribution businesses. Their proposals to apply this and supporting analysis were published on the AER's webpage. The AER's Final Determinations, including additional supporting analysis, were published in May 2016. Information about the Reuters curve and its potential use in regulatory determinations has been available to stakeholders for 9 months, and, as far as AusNet Services is aware, has not attracted comment. Therefore, the AER's concern that consultation is warranted before the curve is applied appears to be misplaced.

6.6.10 New Issue Premium

AusNet Services maintains its position, as set out in its initial Regulatory Proposal, that there exists a cost "premium" to businesses issuing bonds into the primary debt market that it not accounted for in the data sources used by the AER to estimate the return on debt (being observations on the secondary debt market).

Despite the existence of such a premium (quantified by CEG at 27 basis points on 10-year BBB rated debt³⁰⁵), AusNet Services does not seek, in this regulatory proposal, to add any explicit allowance for the "new issue premium" to its return on debt proposal but continues to note that, as a result, AusNet Services' proposed return on debt remains a conservative one.

6.6.11 Debt Raising Costs

In its Revised Revenue Proposal, AusNet Services has adopted the AER's benchmark approach to the estimation of debt raising costs.³⁰⁶ However, AusNet Services submits that this approach to determining debt raising costs should be properly considered as part of the next Rate of Return or Expenditure Forecast Assessment Guideline review.

³⁰³ Appendix 6D – CEG, *Criteria for Assessing Fair Value Curves: An Update*, September 2016, pp. 21-25.

³⁰⁴ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 289.

³⁰⁵ CEG Competition Economists Group, Hird, T; *New Issue Premium*; October 2014, p. 54.

³⁰⁶ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, Appendix K.2.

6.6.12 Annual Updating of the Return on Debt

AusNet Services accepts the AER's Draft Decision in respect of annual updating. Under this approach, 10% of the cost of debt will be updated each year based on prevailing rates.

In its Revenue Proposal AusNet Services nominated averaging periods to be used to estimate the prevailing cost of debt for each year of the regulatory period. The AER accepted AusNet Services' proposed averaging periods in its Draft Decision. AusNet Services accepts the AER's Draft Decision regarding the timing of its proposed debt averaging periods, as set out in confidential Appendix 3-L – Rate of return averaging periods.

AusNet Services proposes the same formula for updating the cost of debt as contained in its Revenue Proposal.

For each of the four years 2018-2022, the annual revenue requirement will be updated by adjusting the return on capital building block for that year as follows:

$$\Delta\text{RocBlockt} = \Delta\text{cod} \times 60\% \times \text{oRABt}$$

Where:

$\Delta\text{RocBlockt}$ is the Adjustment to the return on capital building block in regulatory year t;

Δcod is the change in the trailing average cost of debt in regulatory year t determined in accordance with the process set out in this section x of the proposal relative to the cost of debt for that year applied by the AER in making its transmission determination; and

oRABt is the opening RAB in year t set out in the transmission determination.

Note: The 60% represents the gearing ratio assumed for the benchmark firm.

The formula to be used for each year of the regulatory period is in the box below.

The return on debt for each Regulatory Year of the Revenue Period is to be calculated as follows:

For Regulatory Year 2017-2018: $kd_{2017-18} = T_{2017-18}$;

For Regulatory Year 2018-2019: $kd_{2018-19} = (0.9 \times T_{2017-18}) + (0.1 \times R_{2018-19})$;

For Regulatory Year 2019-2020: $kd_{2019} = (0.8 \times T_{2017-18}) + (0.1 \times R_{2018-19}) + (0.1 \times R_{2019-20})$;

For Regulatory Year 2020-21: $kd_{2020} = (0.7 \times T_{2017-18}) + (0.1 \times R_{2018-19}) + (0.1 \times R_{2019-20}) + (0.1 \times R_{2020-21})$;

For Regulatory Year 2021-2022: $kd_{2021} = (0.6 \times T_{2017-18}) + (0.1 \times R_{2018-19}) + (0.1 \times R_{2019-20}) + (0.1 \times R_{2020-21}) + (0.1 \times R_{2021-22})$,

where:

- k_{dt} is the return on debt for Regulatory Year t of the Regulatory Period; and
- $T_{20XX-YY}$ is the cost of debt that feeds into the calculation of $kd_{2017-18}$ and is not yet matured in 20XX-YY;
- R_t is the annual return on debt observation for each year t of the regulatory periods (other than 2017-18) calculated according to the methodology set out in this Chapter.

In each case a Regulatory Year runs from 1 April until 31 March.

6.7 Expected Inflation

6.7.1 Summary

The estimate of expected inflation influences a number of building blocks, including the indexation of the regulatory asset base, depreciation and the return on capital. If the estimate of expected inflation used to derive the building blocks is not accurate and consistent with inflation

expectations, the result will be a potential under-recovery of costs (if the forecast of inflation is too high) or an over-recovery (if the forecast is too low).

The AER's current approach, relying on Reserve Bank of Australia (RBA) short term inflation forecasts and long term inflation targets, does not produce an estimate of expected inflation which is consistent with inflation expectations. If applied in the Final Decision, the AER's current forecasting methodology would embed a negative real risk free rate in its regulatory decision. This does not reflect market realities – a positive real risk free rate is available to Australian investors today, in the form of index-linked CGS bonds.

The consequence is that the (negative) adjustment made to the revenue requirement for expected inflation is larger than the compensation AusNet Services will receive for inflation. Such under-compensation means AusNet Services will be unable to recover at least its efficient costs and the AER's decision will not contribute to the achievement of the NEO.

AusNet Services' proposal is to estimate expected inflation by reference to a market-based approach (the break-even approach) which AusNet Services submits gives rise to an estimate of expected inflation which is consistent with market expectations.

Alternatively, if the method of estimating expected inflation specified in the AER's PTRM must be used, AusNet Services has proposed an alternative methodology to address the potential for under or over-compensation for inflation.

6.7.2 Background

In its Revenue Proposal, AusNet Services³⁰⁷ submitted that the AER's approach to estimating inflation, relying on RBA forecast and target inflation levels, is not producing an optimal and reliable estimate at the present time. This is because in current market conditions, the monetary policy instruments available to the RBA (and other international central banks) have limited ability to stimulate the economy to reach the target inflation levels reflected in the AER's method.

Instead, it proposed a market based (break-even inflation) approach which resulted in an estimate of 2.35% (using an indicative averaging period over a 10 year term).

In its Draft Decision, the AER rejected AusNet Services' proposal and has continued to apply its method for estimating expected inflation, relying on an average of the RBA's short term inflation forecast (for the first two years) and the mid-point of the RBA's inflation targeting range (for the last 8 years of the 10 year term), giving rise to a forecast of inflation of 2.44%.³⁰⁸

For the reasons set out in this section, AusNet Services maintains its proposal to derive expected inflation using the break-even approach over a 10 year term. As a place-marker, using an averaging period from 1 July to 25 July 2016, this gives rise to a forecast of inflation of 1.65%. This estimate will be updated for AusNet Services' actual debt averaging period, prior to the Final Decision.

As an alternative, if the AER's method for estimating expected inflation in the PTRM must be used, AusNet Services proposes to estimate the real rate of return directly and then add the AER's expected inflation estimate to derive the nominal rate of return required by the National Electricity Rules. This is explained in more detail at the end of this section.

AusNet Services relies upon the following expert reports submitted as Appendices in support of this proposal:

- Appendix 6F – CEG: Best estimate of expected inflation: revaluations and revenue indexation, September 2016.

Other supporting documents submitted and relied upon are listed in Section 6.10.

³⁰⁷ AusNet Services, *Transmission Revenue Proposal*, 30 October 2015, Section 10.6.

³⁰⁸ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 130.

6.7.3 Legislative Framework and the Operation of the PTRM

NER 6A.5.4 states that the annual building block revenue requirement for each regulatory year of a regulatory control period must be determined using a building block approach, under which the building blocks include “indexation of the regulatory asset base”, a “return on capital” and “depreciation” (return of capital).

Pursuant to the return on capital rules, the allowed rate of return is to be determined on a nominal vanilla basis.³⁰⁹ This nominal rate of return is applied to an indexed regulatory asset base (RAB). However, the effect of this combination is a double compensation for inflation, once through the nominal rate of return and once through the indexation of the RAB across regulatory periods.

This is addressed in the NER through the “indexation of the regulatory asset base” building block in NER 6A.5.4(b)(1):

- The regulatory asset base is calculated in accordance with NER 6A.6.1 and NER S6A.2; and
- The building block comprises a *negative* adjustment equal to the amount referred to in NER S6A.2.4(c)(4) for that year (being the amount necessary to maintain the real value of the regulatory asset base as at the beginning of the subsequent year by adjusting that value “for inflation”).

The indexation of the RAB building block is therefore in effect, a deduction from the annual revenue requirement equal to expected inflation. A higher estimate of expected inflation will therefore lead to a larger deduction from the annual revenue requirement in each year.

NER 6A.5.3(b)(1) provides that the post-tax revenue model (**PTRM**) must specify the methodology that the AER determines is likely to result in the best estimate of expected inflation. The estimate of expected inflation is then used to make the negative adjustment to the building blocks described above (through the depreciation building block) to avoid the double compensation for inflation that would otherwise arise.

NER 6A.6.1(e)(3) then provides for the RAB to be rolled forward to the beginning of the next regulatory period using out-turn inflation.

As CEG explain³¹⁰, the AER’s PTRM and RAB Roll Forward Model work together to deliver compensation for inflation as follows:

1. Take a nominal input for the cost of debt and equity.
2. Deduct the estimate of expected inflation to arrive at a real return which is then embedded in the real regulated revenue path.
3. Provide nominal compensation that is equal to:
 - (a) The real return derived in step 2; plus;
 - (b) In the RAB roll forward, compensate for the inflation that actually occurs (outturn inflation) over the regulatory control period.³¹¹

The real revenue path derived in step 2 is the final output of the PTRM model.

In the AER’s Final Decision for AusNet Services’ distribution network, the AER recognised that the objective of the expected inflation estimate is to convert the nominal return to a real return (step 2 above)³¹². As noted above, this is necessary to avoid a double counting of inflation.

³⁰⁹ NER 6A.6.2(d)(2).

³¹⁰ Appendix 6F – CEG, Best Estimate of *expected inflation*, September 2016, section 3.

³¹¹ This is compensated primarily in the RAB roll forward used to set the opening RAB at the beginning of the next regulatory period but also (to a small extent) in the form of price escalation for inflation during the regulatory period.

³¹² AER, *Final Decision*, AusNet Distribution, at 3-154.

The AER further explained the operation of its PTRM and RFM and the role of expected inflation in its recent Explanatory Statement – Proposed amendments to electricity distribution roll forward model released on 31 August 2016:

“A nominal WACC, not a real WACC, is the input to the PTRM at the start of each AER final decision. The real WACC (which drives PTRM outcomes) is derived from the nominal WACC by deducting the expected inflation rate. Hence, an overestimate of inflation means the real WACC will be too low (and vice versa). However, the forecast inflation and the nominal WACC are jointly estimated on consistent terms.³¹³ Directly using the real WACC in the model means we have assumed that this pair of inputs is correctly matched. For example, if forecast inflation is overestimated, but this overestimate of inflation is already included in the nominal rate of return, the real WACC will still be correct. Hence, the construction of the model means we isolate changes in revenue outcomes that reflect the difference between forecast and actual inflation, not errors in the forecast inflation embedded in the WACC.”

In this statement the AER acknowledges that if expected inflation is overestimated, the real rate of return delivered in the current period (by way of the negative adjustment to the building block using expected inflation) will be too low and vice versa.

In other words, if the estimate of expected inflation does not reflect market expectations of inflation built in to the nominal rate of return, the deduction from annual revenues will be too high and the network will be under-compensated for inflation.

6.7.4 The AER's Draft Decision

In the Draft Decision, the AER rejected AusNet Services' proposal and continues to estimate expected inflation over a 10 year term relying on RBA short term inflation forecasts (for the first two years) and the mid-point of the RBA's target inflation range (the last 8 years).

The AER advanced four reasons in support of its approach in the Draft Decision. AusNet Services' responses to each are set out below:

- **RBA research indicates that one year inflation forecasts have substantial explanatory power;** The one year inflation forecasts relied upon by the AER in AusNet Services' Draft Decision was the December 2017 CPI inflation forecast range of 1.5-2.5%. However, the AER's approach only uses this approach for the first two years of its 10 year term so it does not have a significant influence. In addition, CEG do not consider the materials relied upon by the AER support this statement.³¹⁴
- **To the extent that the historical success of RBA monetary policy informs market consensus inflation expectations, the mid-point of the RBA's inflation targeting band would reflect longer term inflation expectations.** The AER noted that since inflation rate targeting in 1993, the average annualised inflation rate has been approximately 2.6 per cent, which is close to the 2.5 per cent midpoint of the target band; CEG³¹⁵ show that actual inflation has been materially below target inflation, particularly since 2014. For the reasons set out below, the AER's estimate of expected inflation is over-estimating inflation expectations.
- **Evidence indicates that the RBA's control of official interest rates and commentary has an impact on outturn inflation and inflation expectations;** As set out in the report from CEG, and the AER acknowledges, in market conditions where rates hit a zero lower

³¹³ The AER's footnote 8 reads “As noted above, this is why forecast inflation in the PTRM is a constant inflation rate with a 10 year horizon.”

³¹⁴ Appendix 6F – CEG, *Best estimate of expected inflation*, September 2016, Section 6.2.1.

³¹⁵ Appendix 6F – CEG, *Best estimate of expected inflation*, September 2016, Section 5.

bound, monetary policy becomes ineffective to impact outturn inflation and inflation expectations.³¹⁶ This is the case in current market conditions.

- **This method is simple, transparent, easily replicated and unlikely to be subject to estimation error.**³¹⁷ This is not a basis on which to choose a method which is otherwise giving rise to inaccurate or unreliable estimates. In addition, the break-even methodology proposed by AusNet Services also satisfies these criteria. Further, as set out in the CEG report³¹⁸ the AER's method is currently overestimating inflation and therefore is subject to estimation error.

In rejecting AusNet Services' proposal, the AER also raised a number of perceived limitations with the break-even approach and found that it was not satisfied changing approach would improve the estimate of expected inflation.³¹⁹

AusNet Services maintains its submissions set out in its Revenue Proposal that reliance upon RBA inflation forecasts and principally on RBA target inflation ranges does not presently give rise to an accurate estimate of expected inflation and is not reflective of investors' inflation expectations.

The consequence is an inconsistency between the adjustments (down) to revenues on the basis of the AER's estimate of expected inflation and the compensation for inflation actually delivered by the PTRM.

For the reasons that follow AusNet Services also submits that the AER's perceived limitations of the break-even approach are unfounded and that its proposal gives rise to a more accurate estimate of expected inflation which reflects investor expectations.

The AER's estimate is inconsistent with inflation expectations

CEG explains that the expected inflation input to the PTRM determines, in combination with the nominal cost of capital inputs to the PTRM, a real rate of return that is delivered to the regulated entity. The AER's current methodology is to estimate the nominal cost of capital inputs based on:

- Nominal corporate bond yields for the cost of debt; and
- Nominal government bond yields as the risk free rate used to determine the cost of equity.

Nominal bond yields determined by supply and demand in financial markets already include bond investors' expectations of inflation. It is the expectation of inflation that is built into nominal bond yields that needs to be estimated and used to make the negative adjustment to the building blocks.³²⁰

Breakeven inflation, derived from bond market yields, is a measure of bond investors expected inflation. It is a direct measure of inflation expectations in the same bond market that the AER uses to set the nominal cost of capital inputs. By contrast, the AER's estimate of expected inflation is not referable to bond market investors' expectations, currently implies negative real returns and is over-estimating inflation expectations. CEG's report sets out why this is the case.³²¹ The main reasons are addressed in the sections that follow.

³¹⁶ Appendix 6F – CEG, *Best estimate of expected inflation*, September 2016, Section 5.5, 5.6, Appendix A.

³¹⁷ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 130.

³¹⁸ Appendix 6F – CEG, *Best estimate of expected inflation*, September 2016, Section 5.

³¹⁹ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, pp.131-132.

³²⁰ Appendix 6F – CEG, *Best estimate of expected inflation*, September 2016, section 3.3.

³²¹ *Ibid*, sections 4 and 5.

The RBA's inflation targets

A critical problem with the AER's approach is the reliance (for 8 of the 10 years in the forward looking term on the RBA's target inflation range) on the RBA's target range. The AER argues that, on average, RBA short term forecasts are reasonable for a 1-2 year period and that the mid-point of the RBA target range is reasonable beyond that. The AER relies on a long term backward looking comparison of actual and RBA target inflation (going back to 1993) to support its approach.³²²

The AER's approach assumes that investors expect inflation will be in the middle of the AER target range after the first two years of the 10 year horizon. As noted by CEG this may be the case in normal market conditions.³²³

However, current market conditions are not normal, that is, typical of historic market conditions, where the risks of below target inflation are heightened.³²⁴

As CEG explain, monetary policy loses its power to lift inflation back to target levels when interest rates approach the "zero lower bound".³²⁵ This is because monetary policy's most direct effect on the economy and therefore on inflation is through lower interest rates. However, the RBA cannot set a cash rate below zero (or at least not materially below zero) because at those levels, businesses and households will prefer to hold cash- delivering a zero rate of interest. It follows that the potential for monetary policy to stimulate economic activity diminishes as interest rates approach zero.

There is various evidence that Australia is presently facing this low inflation trap, including:

- RBA cash rates are at record low levels of 1.5%.³²⁶
- Average inflation for the past two years has been 1.3%, with the June Qtr 2015 to June Qtr 2016 CPI being 1%.³²⁷
- In its May 2016 Statement of Monetary Policy (SoMP), the RBA dramatically reduced its range for forecast inflation from 2-3%, to 1.5-2.5%.³²⁸ The RBA's August SoMP forecasts December 2016 CPI to be 1.5% and year ended forecast to December 2018 in the range of 1.5 to 2.5%.³²⁹
- Break-even inflation estimates are well below AER forecasts even at a horizon of 10 years. The RBA itself is forecasting inflation out to December 2018 to be below the bottom of its target range out to the end of the RBA forecast horizon.³³⁰
- Commentary from the RBA Governor and commentators that Australia faces a "protracted" period of "persistent" low inflation.³³¹
- Evidence that in recent years inflation has been below target levels.³³² The following chart

³²² AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 130.

³²³ CEG, *Measuring expected inflation for the PTRM*, January 2016, paragraph 27.

³²⁴ CEG, *Measuring expected inflation for the PTRM*, June 2015 section 2 and 2.1, *CEG, Estimating expected inflation*, September 2016, section 4.1.

³²⁵ CEG, *Measuring expected inflation for the PTRM*, June 2015, *CEG, Estimating expected inflation*, September 2016, section 4.1.

³²⁶ Appendix 6F – CEG, *Best estimate of expected inflation*, September 2016, at [68].

³²⁷ ABS, *CPI Australia*, June 2016, released 27 July 2016.

³²⁸ RBA, *Statement of Monetary Policy*, May 2016, table 6.1.

³²⁹ RBA, *Statement of Monetary policy*, August 2016, table 6.1, p. 67.

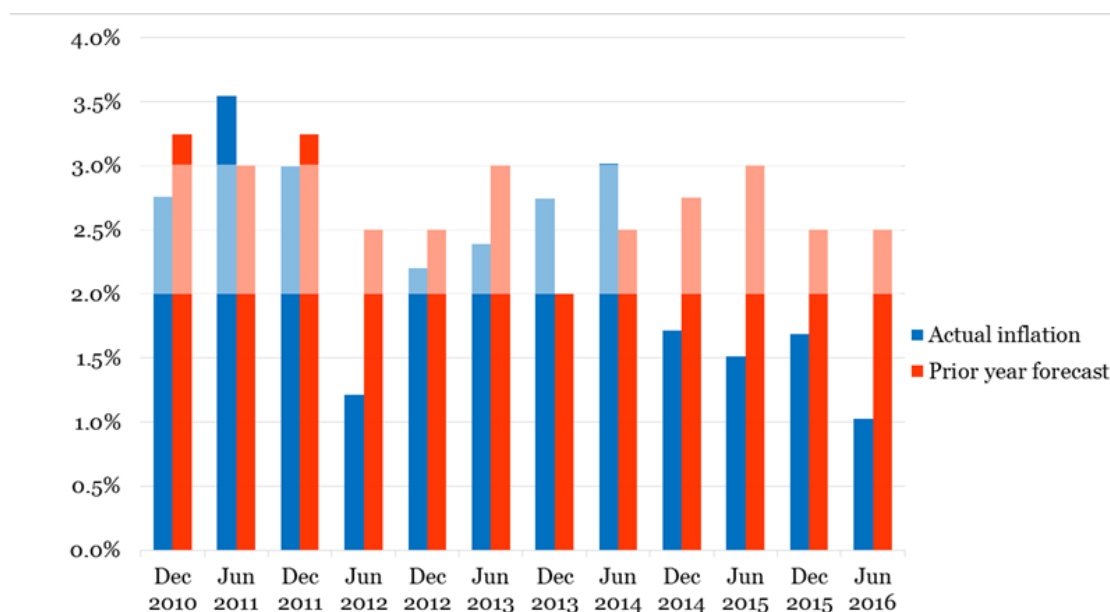
³³⁰ Appendix 6F – CEG, *Best estimate of expected inflation*, September 2016.

³³¹ Appendix 6F – CEG, *Best estimate of expected inflation*, September 2016, Section 5.6 and Appendix A [189].

³³² CEG, *Measuring expected inflation for the PTRM*, June 2015, paragraphs 27-33.

compares actual inflation with the prior year forecast and the RBA's target band. Other developed countries have also seen inflation below target levels.

Figure 6.12: Actual Inflation vs Prior Year RBA Forecast and RBA Target Band³³³



Source: CEG, *Best estimate of inflation, September 2016, Figure 6*

The AER acknowledges that if monetary policy loses its effectiveness to influence economic activity, inflation expectations may deviate from the mid-point of the inflation target range.³³⁴ Given current market conditions, mean expected inflation should be expected to be below the midpoint of the RBA target range.

The AER's estimate for expected inflation implies negative real returns

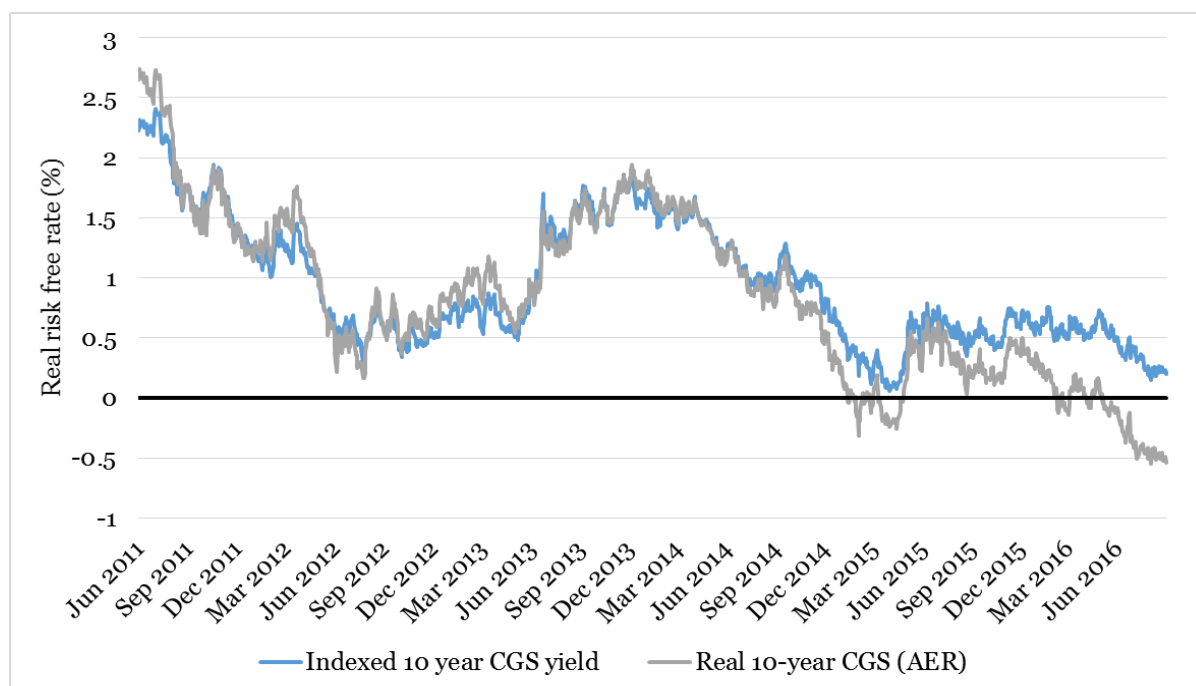
The yield on 10-year indexed CGS over the last 5 years is provided in the below Figure extracted from the CEG report.³³⁵ It is relevant to compare this yield with the estimated real risk free rate applying the AER's current methodology, which is to deduct its estimate of expected inflation from the yield on 10 year nominal CGS.

³³³ Actual inflation data reflects the annual change in CPI over the year to June/December (as relevant), as reported by the ABS. The prior year forecast for each December and June quarter is the RBA forecast for the relevant quarter, as set out in the RBA's Statement on Monetary Policy for May of the prior financial year (e.g. for the December 2014 and June 2015 quarters, the prior year forecast is as set out in the RBA's Statement on Monetary Policy for May 2014).

³³⁴ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 132, table 3-19.

³³⁵ *Ibid* at section 5.1.

Figure 6.13: Competing 10-year real risk free rate estimates (last 5 years)



Source: CEG, Best estimate of inflation, September 2016, Figure 1

It can be seen that until late 2014, the AER's methodology implied a real risk free rate that was similar to the yield on indexed CGS. However, since then the AER's estimate of the real risk free rate has fallen significantly and is currently negative 0.5%. That is, the AER's estimate implies that investors are expecting to lend to the Australian government in return for receiving less in purchasing power after 10 years than they invested originally.

This is inconsistent with the fact that the indexed CGS are offering guaranteed positive real returns.

6.7.5 The Breakeven Approach

As noted in AusNet Services' Revenue Proposal, until 2008 the AER used the break-even approach to estimate expected inflation. This approach measures inflation by reference to the difference between the yields on nominal and real Commonwealth government bonds. After 2008, the AER changed to its current method due to concerns that post the global financial crisis, a scarcity of indexed bonds meant the results from the breakeven approach were not reliable. AusNet Services agrees that during this time, it was appropriate to move to a different methodology.

Equally, AusNet Services contends that market conditions are now such that the AER's method relying (primarily) on RBA target inflation, in circumstances where current market conditions hamper the effectiveness of monetary policy to achieve those targets, does not represent an accurate estimate of expected inflation and there should be a change in approach.

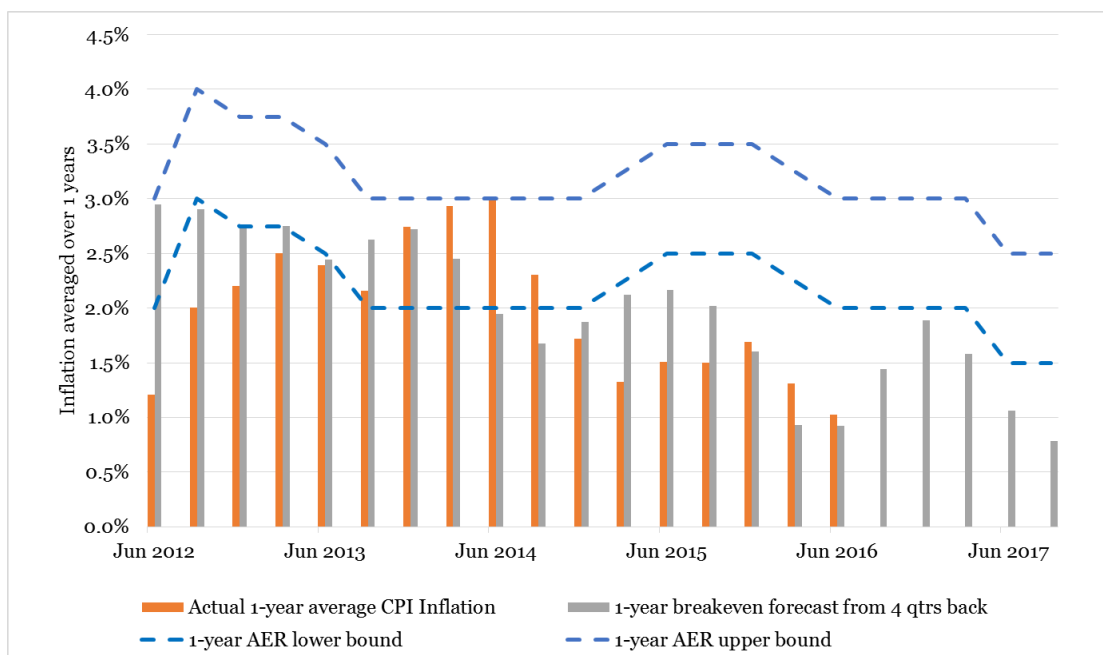
As noted above, it is bond investors' expectations of inflation which are relevant and break-even inflation provides a measure of those expectations. This section explains the basis for estimating expected inflation using the break-even approach and why the AER's concerns with that approach in its Draft Decision are unfounded.

Break-even inflation estimates versus AER estimates of inflation expectations

CEG's report demonstrates that since 2011, break-even inflation estimates have more accurately predicted actual inflation than the RBA forecast ranges relied upon by the AER. CEG show that

using a 1 year, 2 year and 3 year break-even inflation rate, break-even inflation rates have typically performed best.³³⁶

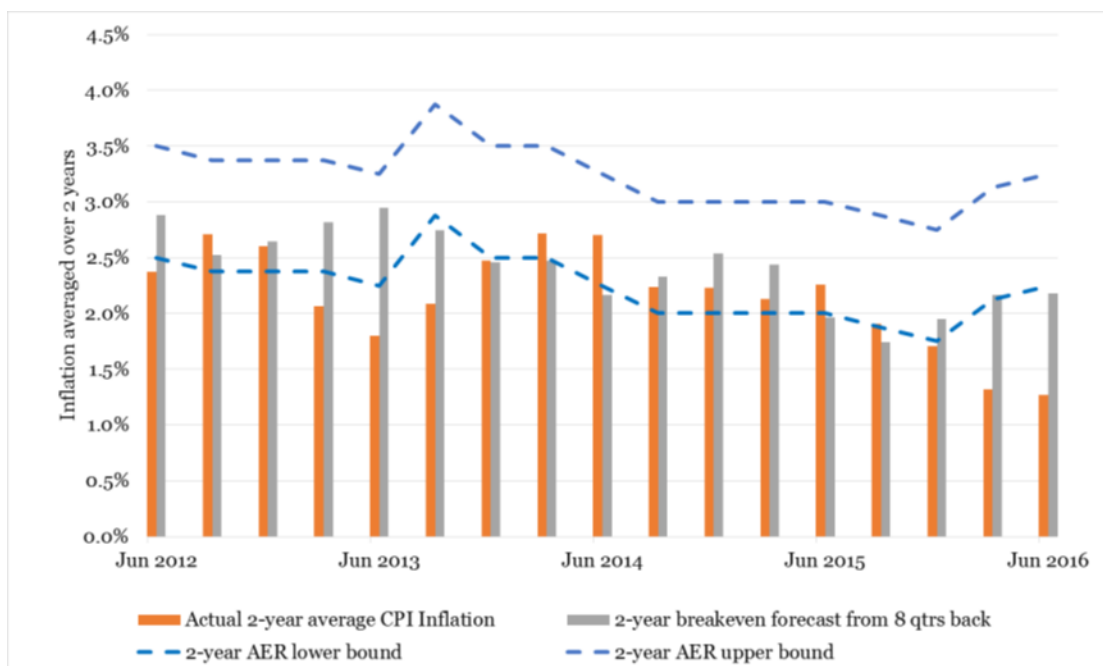
Figure 6.14: 1 year break-even inflation vs RBA range



Source: CEG, Best estimate of inflation, September 2016, Figure 5

A similar story exists using 2 year inflation estimates. Once more, break-even inflation has performed materially better than the mid-point of the RBA range for the most recent years:

Figure 6.15: 2 year break-even inflation vs RBA range

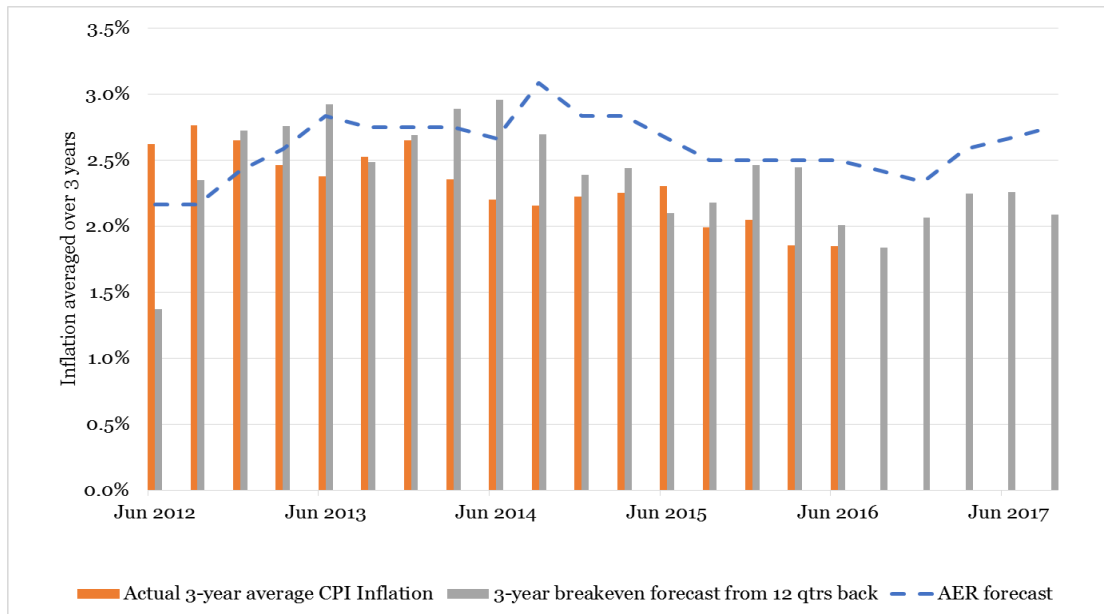


Source: CEG, Best estimate of inflation, September 2016, Figure 7

³³⁶ Appendix 6F – CEG, Best estimate of expected inflation, September 2016, section 5.3.

The same can be seen from the 3 year inflation estimates:

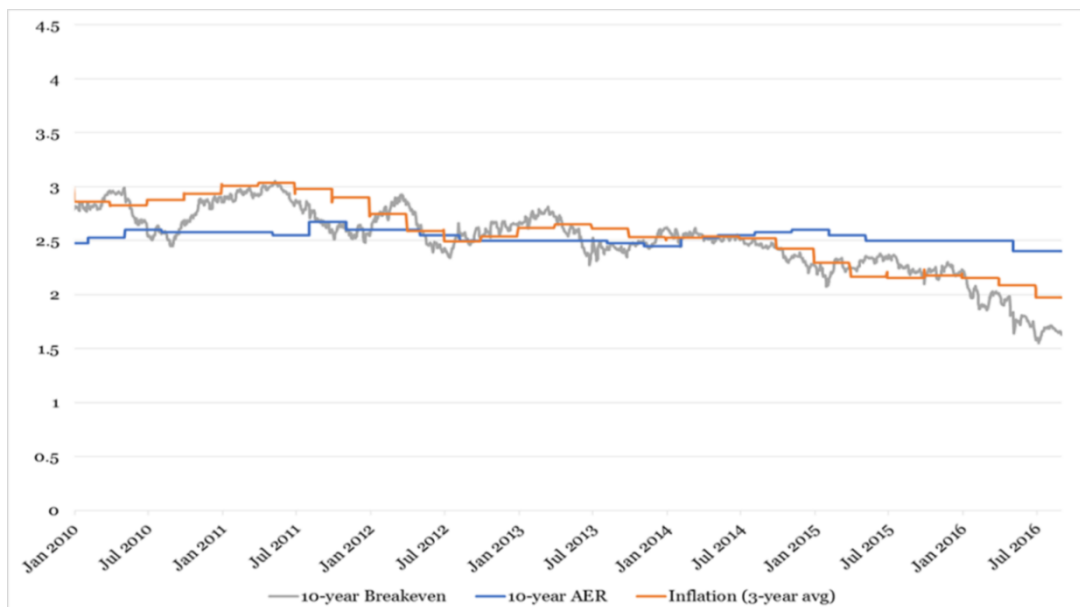
Figure 6.16: 3 year break-even inflation vs RBA range



Source: CEG, Best estimate of inflation, September 2016, Figure 8

CEG has also shown in the following chart that break-even inflation has responded quickly to actual inflation falling well below RBA targets from late 2015.³³⁷

Figure 6.17: Break-even inflation vs AER inflation (10 years) vs actual inflation (1 year) less 2.5%



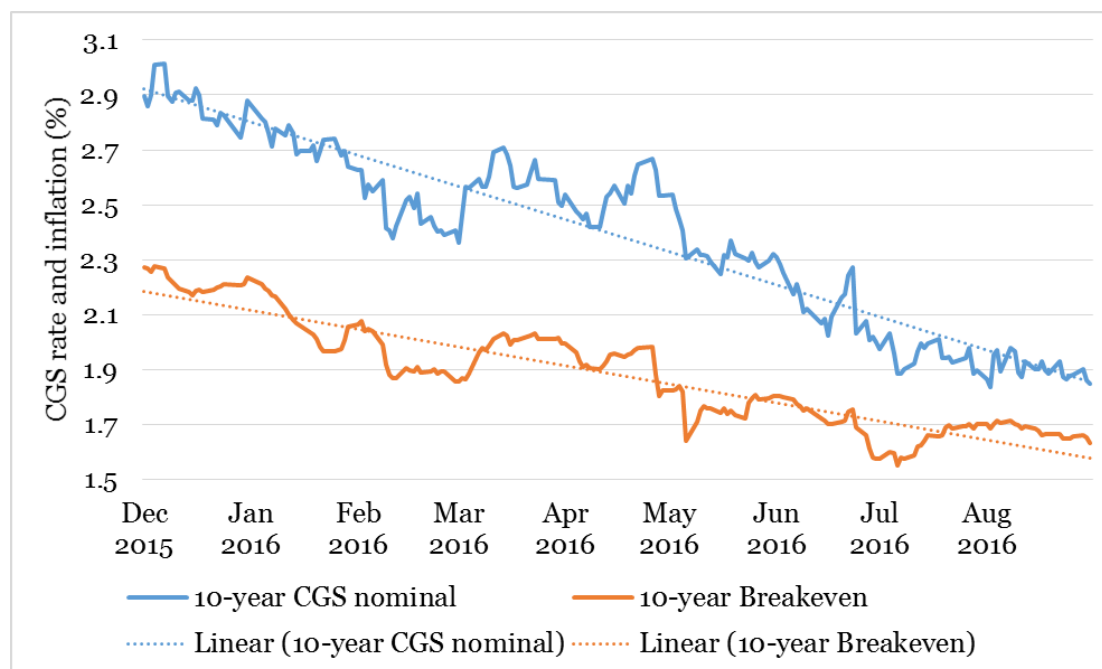
Source: CEG, Best estimate of inflation, September 2016, Figure 2

³³⁷ Ibid, section 5.1.

Falling break-even inflation explains falling nominal costs yields

There has been a material fall in nominal CGS yield since AusNet Services submitted its Revenue Proposal. Nominal CGS yields over AusNet Services' indicative debt and inflation averaging period are at 1.98% CEG's expert opinion is that the fall in CGS yields has been associated with a similar fall in inflation expectations, rather than falls in real yields. This can be seen from the Figure below which shows nominal CGS yields and 10 year breakeven inflation:

Figure 6.18: 10-year nominal CGS rates and 10-year breakeven inflation



Source: CEG, *Best estimate of inflation, September 2016, Figure 9*

If inflation is assumed to have remained constant around 2.5% over the December 2015 to August 2016 period, this would imply that real CGS yields have fallen by the same magnitude as nominal CGS yields and that relative yields have in fact become negative. This is an anomalous result and demonstrates the inaccuracy of the AER's estimate.³³⁸

CEG conclude that based on its analysis, the AER's estimate of inflation is unrealistically stable and has not responded to a dramatically changing inflation environment and leads to an overestimate of expected inflation.³³⁹ The CEG report establishes that break-even estimates of inflation have better predicted actual inflation than the AER's method relying on RBA forecast and target ranges and AusNet Services submits that the break-even approach will better estimate inflation expectations of investors.

Scarcity and Liquidity

The AER say that the size and liquidity of the indexed CGS is still limited. Further, increased absolute liquidity in the indexed CGS market does not necessarily imply that this market has become more liquid relative to the nominal CGS market.³⁴⁰

However, the smaller size (short supply) of the indexed CGS market was previously attributed as a reason for break-even inflation overstating expected inflation (not understating it). If these

³³⁸ Appendix 6F – CEG, *Best estimate of expected inflation, September 2016, section 5.7.*

³³⁹ *Ibid*, section 5.8.

³⁴⁰ AER, *AusNet Services Draft Decision, July 2016: Attachment 3 – Rate of Return, p. 136.*

'distortions' still exist then they imply that the actual expected inflation is even lower than the break-even rate.³⁴¹

The AER states that the size and liquidity of the indexed CGS market is still limited referencing a Treasury paper from 2012. The AER references page 7 where the following quote can be found:

"The use of bond market break-evens is also made somewhat problematic by the limited size and liquidity of the indexed bond market in Australia."

However, it is clear from the context that this statement applies to the historical data being used in the paper – not necessarily to the data at the time of writing.

Further, since 2012 there has been significant new issues of indexed bonds. For example, the Treasury paper states *"In late 2009, however, the AOFM resumed its indexed bond issuance program and the market has since grown to just over \$16 billion outstanding. There are currently five indexed bond lines on issue, with maturities ranging from 2015 to 2030."*

The AER states *"Liquidity bias can be material and difficult to identify and remove from the breakeven rate—particularly as evidence indicates that it can vary considerably over time."* However, of the two papers that the AER cites one is from 2001 – when the TIPS market was in its infancy (a period when all of the rest of the AER's cited articles agrees that there was a newness/strangeness/liquidity premium) and the other paper similarly covers the period 1999 to 2008 which include the infancy of the indexed bond market and the GFC.

In relation to CPI swaps as an estimate of expected inflation, Appendix B to the CEG report shows that this measure will tend to be biased upwards to account for risk premiums and capital costs for the banks providing these products. Consistent with that, inflation swap estimates of expected inflation remain above break-even estimates and AusNet Services submits they are not an appropriate basis on which to estimate forecast inflation.

Bias

The AER has alleged four *potential* sources of bias in the breakeven approach. The AER relies upon a number of articles in support of its position. CEG has undertaken a review of the literature relied upon by the AER as well as papers not cited by the AER.

CEG's literature review shows an overwhelming conclusion that the potential sources of bias are small and just as likely to result in an over-estimate of expected inflation as an under estimate.³⁴²

- Convexity bias – this is said to exist because of two phenomena. Firstly, it is said that nominal security (bond) yields are more volatile than indexed bond yields, and therefore the difference between the two is not purely the inflation expectation of holders.³⁴³ Secondly, it is said that bond investors are more sensitive to reductions in yield than to increases in yield. Therefore, it is argued, there is a bias which tends to raise nominal bond prices (and so depress their yields), relative to indexed bond prices, narrowing the spread in yields between them and so tending to underestimate the inflation estimate produced by the break-even / methodology. The source the AER cites in support of this potential bias is not an empirical study, but is a brief, high-level Bank of England Quarterly article from 2002 (Scholtes 2002). It does not set out any data on which the convexity bias theory might be based and does not attempt to estimate the impact of the convexity bias.³⁴⁴

³⁴¹ Appendix 6F – CEG, *Best estimate of expected inflation*, September 2016, para 105-106.

³⁴² Appendix 6F – CEG, *Best estimate of expected inflation*, September 2016, Section 6.

³⁴³ See the AER's explanation in Table 3-20 at 3-155 of the Draft Decision.

³⁴⁴ Scholtes, C., 'On market-based measures of inflation expectations', Bank of England Quarterly Bulletin, Spring 2002, p. 71, CEG, 6.1.3.

- Inflation risk premium bias – the AER note this generally results in an overestimate of inflation rather than an underestimate. This is confirmed by CEG’s review of the Grishchenko and Huang (2012) paper cited by the AER.³⁴⁵
- Liquidity premium bias – this is said to exist because nominal bonds have a premium in them for liquidity essentially arising from the fact that indexed bonds are relatively less liquid. The AER contends therefore that the difference between nominal and indexed bonds is not purely based on inflationary expectation.³⁴⁶ The AER relies on Shen and Corning [2001]. CEG find that the article provides little, if any, support for the AER’s propositions³⁴⁷ in support of the existence of this potential bias. However, that paper is old and relates to the US securities market.
- Inflation Indexation lag bias – this is said to potentially be an underestimate or overestimate and it is potentially small.

Only the convexity and liquidity premium issues are said to result in a potential downward bias of expected inflation forecasts and even if such a downward bias existed, the quantum of any such bias has not been identified by the AER. CEG’s review of the literature not relied upon by the AER supports the conclusion that if any bias exists, it is small and does not necessarily result in an under estimate of inflation.³⁴⁸

Summary

The AER’s methodology for estimating 10-year inflation results in an estimate that is currently much higher (around 70bp) than expectations implied in bond market prices. It also results in a significantly negative real risk free rate (around -50bp). This is contrary to investors being able to earn a positive guaranteed real return on inflation indexed Commonwealth Government Securities (CGS).

Break-even inflation is a better estimate of expected inflation. The AER’s methodology assumes that investors expect that inflation will be in the middle of the RBA target range (2.5%) at horizons beyond two years. While this may have been a reasonable assumption historically (and may be in future years) it:

- Cannot always be presumed to be reasonable; and
- Is not a reasonable assumption in current market circumstances.

As CEG’s report shows, in current circumstances the AER’s estimate of expected inflation, in particular the assumption that investors expect inflation to average 2.5% beyond two years, is at odds with all of the available evidence. Namely:

- Break-even inflation estimates (1.7%) are well below AER forecasts (2.4%) even at a horizon of 10 years. The RBA itself is forecasting inflation out to December 2018 to be below the bottom of its target range out to the end of the RBA forecast horizon.
- In the current monetary policy environment, where policy rates are close to the zero lower bound, the greatest risks to inflation are to the downside. This risk is not theoretical, all Western developed countries currently have monetary policy settings with policy rates close to zero and all are currently undershooting inflation targets.
- Expected inflation is the actuarially expected inflation (average of all possible inflation outcomes weighted by their probability). So, even if investors perceived that the most likely

³⁴⁵ Section 6.2.4.

³⁴⁶ AER, *AusNet Services Draft Decision*, July 2016: Attachment 3 – Rate of Return, p. 133, Table 3-20.

³⁴⁷ Section 6.2.5.

³⁴⁸ Section 6.2.3.

expected inflation was 2.5%, expected inflation would be below this once the greater downside risks were appropriately weighted.

- The AER's estimate of expected inflation implies that investors expect a negative real return on the risk free rate. The fact that they can achieve a positive guaranteed real risk free return simply by buying inflation indexed CGS demonstrates this is clearly not the case.
- Break-even inflation forecasts have been more reliable than the AER's forecasting methodology in recent years. Break-even inflation forecasts accurately predicted the recent fall in inflation below the bottom of the RBA's target range while the AER's methodology did not.
- An expectation that Australian inflation will jump to 2.5% at the end of the RBA forecast period is inconsistent with the fact that Australian (and global) inflation rates have been persistently below target for many years, with instances of deflation in Australia (March quarter CPI), US, Japan, the UK and the Eurozone.
- Falling 10-year break-even inflation is a statistically significant explanatory variable when regressed against nominal CGS yields – suggesting that most of the recent fall in nominal CGS yields is due to falling inflation expectations (not falling required real returns as implicitly assumed by the AER).

Finally, CEG has shown that the AER's perceived limitations of the breakeven approach and its finding that it is not satisfied it would improve its estimate of expected inflation are unfounded and incorrect.

6.7.6 The PTRM Issue

The AER also raised procedural reasons for not adopting AusNet Services' proposed approach which are summarised below:

- A building block proposal must be prepared in accordance with the AER's post-tax revenue model (PTRM);
- The contents of the PTRM must include a method that the AER determines is likely to result in the best estimates of expected inflation;
- The PTRM can only be amended in accordance with the transmission consultation procedures, which set out a separate process for the review and consultation of the PTRM which is outside of the transmission determination; and
- It follows that the method for estimating expected inflation cannot be amended through the transmission determination process.

However, the AER's position that it is unable to change the method of estimating expected inflation as a result of constraints in the NER for amending the PTRM fails to take account of the following:

- The NER require that the annual revenue requirement for each regulatory year include an adjustment equal to the amount by which the RAB is adjusted for inflation in that year, as well as amounts for depreciation and a return on capital;³⁴⁹
- It is necessary for the AER to determine a forecast of inflation as an input into these building block decisions;
- The NER do not require that the inflation forecast used to determine the above building blocks be determined in accordance with the method specified in the PTRM;
- The AER is also required to specify appropriate methodologies for indexation of the RAB;³⁵⁰

³⁴⁹ NER 6.4.3.

- The AER's determination includes a decision on the annual revenue requirement which must include the indexation of the regulatory asset base;
- The PTRM provisions do not relieve the AER of its obligations under the NER to determine an accurate estimate of inflation and to provide the service provider with a reasonable opportunity to recover at least its efficient costs. If the forecast of inflation is inaccurate, the annual revenue requirement will not reflect efficient costs. In turn, this will not result in a decision which promotes the achievement of the NEO, being to promote the efficient investment in, and efficient operation and use of electricity services in the long term interests of consumers. The AER's interpretation leads to a position where it must rigidly apply the method for forecasting inflation which is specified in the PTRM without regard to whether that method gives rise to an estimate which meets the requirements of the NER.
- Further, the transmission consultation procedures on which the AER relies are discretionary and it is completely in the control of the AER whether it reviews and amends the PTRM at any given time. It would be a perverse outcome and contrary to the regulatory scheme if the method for forecasting inflation was essentially locked into the PTRM with no ability to review that method or its resulting estimate when applied to a building block determination.

AusNet Services submits that in making the transmission determination, it is open to the AER to apply an alternative method to the PTRM method.

The proposal to change the method for estimating expected inflation has now been the subject of a number of service providers' proposals (including Victorian electricity distribution networks and SA Power Networks), resulting in the issue being the subject of extensive consultation with stakeholders. AusNet Services submits that it is appropriate to change the methodology for estimating forecast inflation by way of the transmission determination process.

6.7.7 An Alternative Approach

If it is the case that the correct interpretation of the NER is that the method for estimating inflation specified in the AER's PTRM must be applied to AusNet Services' Transmission Determination (which is disputed for the reasons set out above), then AusNet Services submits that there are alternative approaches to delivering compensation for inflation which comply with the NER and the AER's PTRM method.

As noted above, where the estimate of inflation does not accurately estimate inflation expectations in bond yields there will be a mis-match resulting in under (or over) compensation. The heart of the issue is that the subtraction (negative adjustment) from the building blocks using the estimate of expected inflation does not match the amount the service provider will recover for inflation. The way to remedy this problem is to ensure that the negative adjustment and the amount actually compensated for inflation are consistent, or as close as is possible. There are a number of ways this could be achieved, including:

- Making the negative adjustment using expected inflation and rolling forward the RAB using the same estimate of expected inflation, rather than outturn inflation. However, AusNet Services acknowledges this is not currently possible under the NER.
- As an alternative, directly estimate a real return on equity and debt to which the AER's estimate of expected inflation is applied to derive a nominal rate of return. An example of how this approach would work in practice follows.

Return on Equity

The AER's methodology for estimating the cost of equity is to add a risk premium of 4.5500% (equity beta of 0.7 x MRP of 6.5%) to the risk free rate. The AER's practice has been to add this

³⁵⁰ NER 6.3.2(2).

to nominal risk free rate (of, say, 2.0000%) to arrive at a nominal cost of equity of 6.5500% from which, within the PTRM, expected inflation is removed in order to deliver a real rate of return.

The AER could also deflate the 4.5500% risk premium by expected inflation in order to turn it into a real risk premium.³⁵¹ Assume expected inflation is 0.9901% in which case the real risk premium is:

$$\text{Real risk premium} = 4.5500\% / (1+0.9901\%) = 4.5054\%$$

This real risk premium is then added to the best estimate of the real risk free rate which, for the purpose of this example, assume to be 1.0000%. This gives a real cost of equity of:

$$\text{Real cost of equity} = 5.5054\%.$$

This estimate of the real cost of equity is then transformed into a nominal return using the Fisher equation and expected inflation (assumed above to be 0.9901%).

$$\begin{aligned} \text{Nominal cost of equity (PTRM input)} &= 5.5054\% + 0.9901\% + 5.5054\% \times 0.9901\% \\ &= 6.5500\% \end{aligned}$$

It is useful to note that, in this illustration the nominal risk free rate is 2.0%, the real risk free rate is 1.0% and the estimate of expected inflation is the difference between these values (using the Fisher equation).³⁵² In this situation you get the same answer whether you start with a nominal or a real risk free rate. This is because the estimate of expected inflation is consistently determined as the difference between these real and nominal rates.

By contrast, if the estimate of expected inflation was higher than implied by the Fisher equation (say, 2.00%) then the nominal cost of equity would be higher (7.62)%. The real return delivered by the PTRM would be unaffected at 5.5054% because the higher expected inflation used to derive the nominal cost of equity would also be removed from revenues within the PTRM – leaving the real return unchanged.

Return on Debt

The AER's methodology for estimating the cost of debt is to simply take the average nominal cost of debt from various published data sources. Assume for the purpose of this example that this average was 5.5000%.

The AER could calculate a debt risk premium by deducting its estimate of the nominal risk free rate. Consistent with the previous example, assume that this is 2.0000% implying a DRP of 3.5000%. Once more, this 3.5000% risk premium would be deflated by expected inflation in order to turn it into a real risk premium. Assume expected inflation is 0.9901% in which case the real risk premium is given by:

$$\text{Real risk premium} = 2.5000\% / (1+0.9901\%) = 2.4755\%$$

This real risk premium is then added to the best estimate of the real risk free rate which, for the purpose of this example, assume to be 1.0000%. This gives a real cost of debt of:

$$\text{Real cost of debt} = 2.4755\% + 1.0000\%.$$

This estimate of the real cost of debt is then transformed into a nominal return using the Fisher equation and expected inflation (assumed above to be 0.9901%).

³⁵¹ This risk premium is largely, but not wholly, net of inflation in the form the AER uses it. Because the risk premium is expressed as a return in excess of the risk free rate it is already in excess of inflation (in the Fisher equation ($n=r+p+r*p$) it is in excess of "p". However, it still has $r*p$ embedded in it (i.e., it is the real risk premium plus the real risk premium multiplied by inflation). Therefore, it must be divided by $(1+p)$ in order to remove this element of inflation compensation to transform it into a pure real risk premium.

³⁵² That is, 0.9901% expected inflation is the inflation implied by a 2.0000%/1.0000% nominal/real risk free rate ($0.9901\% = (2\% - 1\%) / (1+1\%)$).

$$\begin{aligned} \text{Nominal cost of debt (PTRM input)} &= 3.4755\% + 0.9901\% + 3.4755\% \times 0.9901\% \\ &= 4.5000\% \end{aligned}$$

In this illustration the nominal risk free rate is 2.0%, the real risk free rate is 1.0% and the estimate of expected inflation is the difference between these values (using the Fisher equation). Consequently, we get the same answer whether we start with a nominal or a real risk free rate. This is because the estimate of expected inflation is consistently determined as the difference between these real and nominal rates.

By contrast, if the estimate of expected inflation was higher than implied by the Fisher equation (say, 2.00%) then the nominal cost of debt would be higher (5.51)%. The real return delivered by the PTRM would be unaffected at 3.4755% because the higher expected inflation used to derive the nominal cost of equity would also be removed from revenues within the PTRM – leaving the real return unchanged.

Using this approach, the AER's PTRM inflation would:

- Add to annual revenues, through an increase in the nominal WACC; and
- Subtract from nominal revenues through the negative adjustment.

However, due to the interactions with the tax building block, this would not have an equal and opposite impact on revenues. The higher nominal return on debt would reduce the tax allowance compared to the optimal solution.

Notwithstanding this, AusNet Services considers this alternative approach would satisfy the requirements of the PTRM, results in the delivery of a real return which better reflects market realities and addresses the current under-compensation for inflation. It is therefore materially preferable to the AER's approach in the context of the NEO.

Application of alternative approach to AusNet Services' proposal

Applying this alternative approach to AusNet Services' Revised Revenue Proposal using proposed breakeven inflation of 1.6548% and the AER's Draft Decision estimate of expected inflation of 2.44%, results in the nominal WACC shown in the Table below.

Table 6.5: Alternative Approach to Deriving the Nominal WACC

	Real Return	Nominal Return
Debt	5.81%	8.39%
Equity	5.45%	8.02%

6.8 Interrelationships

Return on equity and the value of imputation credits

There is a recognised interrelationship between the return on equity and the value of imputation credits. Some estimates of the MRP need to be grossed up for the value of imputation credits and a higher theta estimate implies a higher required return on equity. This interrelationship is explicitly recognised in *NER 6A.6.2(d)(2)*.

AusNet Services' proposed MRP of 7.5% takes into account this interrelationship. Frontier Economics conclude that the current evidence supports an estimate of at least 7.5% based on calculations of the MRP which assume a theta value of 0.35 as proposed by AusNet Services.³⁵³

³⁵³ Appendix 6B – Frontier Economics, *The market risk premium*, September 2016, section 8.6 and [284].

If the AER were to adopt an estimate of theta to 0.35, as proposed by AusNet Services, while maintaining its current approach to estimating the MRP (which is submitted by AusNet Services to be incorrect), no adjustment to the AER's MRP estimate of 6.5% would be necessary. This is because the historic excess returns estimates on which the AER primarily relies for its MRP are relatively insensitive to the estimate of theta.³⁵⁴

Interrelationship between the rate of return and the inflation forecast

As noted in AusNet Services' submissions on forecast inflation above, there is an interrelationship between:

1. The method for an estimate of expected inflation and the amount that is deducted from the annual revenue requirement by way of the indexation of the regulatory asset base building block (the negative adjustment). As explained above, if actual inflation turns out to be materially lower than had been forecast, the deduction from the annual revenue requirement will be too large. This will lead to under-recovery of costs over the long-term.
2. The allowed rate of return and the estimate of expected inflation. The deduction from the annual revenue requirement for indexation is needed to avoid a "double counting" of inflation. This results from the application of a nominal rate of return to an indexed capital base. It is therefore important that the forecast of inflation that is being deducted from the annual revenue requirement is consistent with expectations which are built in to the nominal rate of return.

AusNet Services' proposal to adopt a market-based estimate of expected inflation ensures consistency with how the allowed rate of return is estimated, and in current market conditions, will provide for a more accurate forecast. Its alternative proposal to derive the nominal rate of return from a real return on equity and debt to which the AER's inflation forecast is added ensures the amount of the negative adjustment equals the compensation for inflation in the rate of return by applying the same estimate in both places.

6.9 Revised Revenue Proposal

For the reasons set out in this chapter, AusNet Services' Revised Revenue Proposal departs from the AER's recent decisions and the Rate of Return Guidelines in the following respects:³⁵⁵

- **Return on Equity** – In the Guideline, the AER established a method for estimating the MRP which was to estimate a range and then select a point estimate from within the range. The AER developed its December 2013 range using the two methods on which it placed greatest reliance. At the time of the Guideline the range was:
 - Historic excess returns supporting a range at the time of the Guideline of 5% to 6.5%.
 - The DGM method supporting a range of 6.1% to 7.5%.³⁵⁶

The AER then selected a point estimate from within the range which as at December 2013 was 6.5%.³⁵⁷ The AER noted this point estimate lies between the (then) historical average range and the range of estimates produced by the DGM.

In this Revised Revenue Proposal AusNet Services has updated the evidence on which the AER relied in forming its range for the MRP in its Guideline (and subsequent decisions). Consistent with the Guideline approach, AusNet Services then selects a point estimate from within that range. For the reasons set out below, AusNet Services' proposal is to adopt a

³⁵⁴ Ibid, section 8.7.

³⁵⁵ It is noted that the AER's Guideline did not specify a method for forecasting inflation, so there is no departure in that regard.

³⁵⁶ AER, *Rate of Return Guideline*, Explanatory Statement, pp. 95-97.

³⁵⁷ Ibid at 135.

point estimate of 7.5%. AusNet Services does not consider that the approach adopted in this Revised Revenue Proposal is inconsistent with the approach set out in the Guideline, but does acknowledge that the MRP estimate adopted is not consistent with the AER's decisions made under its Guideline to date. However, the current market conditions which are characterised by a historically low risk free rate have not yet been considered by the AER in its determinations.

- **Return on Debt** – The AER's Rate of Return Guideline approach was to apply a transition from the previous "on the day" approach to a trailing average return on debt. AusNet Services proposes a trailing average approach to the return on debt with no transition (immediate implementation). The reasons why AusNet Services proposes not to apply a transition are set out in detail in the return on debt section above.

In addition, AusNet Services' Revised Revenue Proposal departs from the benchmark credit rating specified in the Guideline, being BBB+. Instead, it has adopted a benchmark credit rating of BBB/BBB+. The reasons for this departure are set out in Section 6.6.7.

For the reasons set out in this chapter, AusNet Services' Revised Revenue Proposal adopts the Rate of Return and Forecast Inflation estimates shown in the Table below.

Table 6.6: Revised Revenue Proposal Rate of Return and Forecast Inflation

Parameters	Revised Revenue Proposal
Return on Equity	7.2%
Return on Debt	7.56%*
Leverage	60%
Forecast Inflation	1.65%

* In the PTRM the cost of debt included for each year of the regulatory period reflects the path of historical rates that will be applied under an immediate debt transition.

6.10 Supporting Documents

The following Appendices support this Chapter:

AusNet Services relies upon the following expert reports relating to the return on equity and the return on debt submitted in support of this Revised Revenue Proposal:

- Appendix 6A – CEG: Replication and Extension of Henry's beta analysis, September 2016
- Appendix 6B – Frontier Economics: The market risk premium, September 2016
- Appendix 6C – CEG: The AER's Current Interpretation of the ARORO, September 2016
- Appendix 6D – CEG: Criteria for Assessing Fair Value Curves: An Update, September 2016
- Appendix 6E – CEG: Review of AER Position on Curve Selection
- Appendix 6F – CEG: Best estimate of expected inflation: revaluations and revenue indexation, September 2016

The following technical supporting documents are also provided:

- CEG: Debt Staggering of Australian businesses, December 2014
- CEG: Measuring expected inflation for the PTRM, June 2015
- CEG: Measuring expected inflation for the PTRM, January 2016
- A calculation of break-even inflation over the July 2016 placeholder averaging period

- A memo setting out the basis for the cost of debt included in the PTRM
- May 2016 RBA Statement of Monetary Policy
- August 2016 RBA Statement of Monetary Policy
- Pflueger and Viceira, Return Predictability in the Treasury Market: Real Rates, Inflation and Liquidity, February 2015
- Banco Central do Brasil, Inflation Report, December 2014
- Ang, Bekaert and Wei, Term Structure of Real Rates and Expected Inflation, April 2008
- Lehman Brothers, TIPS Valuation Framework, August 2006
- Coroneo, TIPS Liquidity Premium and Quantitative Easing, April 2016

7 Tax and the Value of Imputation Credits

This chapter sets out AusNet Services' response to the Australian Energy Regulator's (AER's) Draft Decision with respect to tax and the value of imputation credits as set out in Attachments 4 and 8 of the Draft Decision. AusNet Services' initial positions were set out in Chapter 11 of the Revenue Proposal.

In the event of inconsistency between information contained in this chapter and AusNet Services' Revenue Proposal, the information contained in this chapter prevails.

7.1 Key Points

- AusNet Services adopts the Draft Decision in relation to the opening Tax Asset Base, but has applied further adjustments to improve the accuracy of historical capex allocation; and
- AusNet Services continues to propose a value of imputation credits of 0.25. This value has recently been upheld by the Australian Competition Tribunal for the second time and reflects the value implied by the most reliable evidence available.

7.2 Summary

7.2.1 Draft Decision

The AER did not accept AusNet Services' proposed corporate income tax allowance of \$167.9m (nominal). The Draft Decision allowed \$60.6m (\$ nominal) over the regulatory control period. This was driven by:

- Amendments to AusNet Services' opening TAB due to adjustments made to actual capex values in the proposed Roll Forward Model;
- Amendments to remaining tax asset lives for Group 3 assets and assets to which accelerated depreciation applies;
- Change to the proposed tax treatment of revenue adjustments associated with the efficiency benefit sharing scheme; and
- An alternative value of imputation credits.

AusNet Services' proposed tax allowance compared to the Draft Decision tax allowance is shown in the Table below.

Table 7.1: Proposed Tax Allowance (\$m, nominal)

Tax Allowance	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Revenue Proposal	31.2	31.7	35.8	37.8	31.5	167.9
Draft Decision	13.4	10.9	12.6	14.3	9.4	60.6
Difference	-57%	-66%	-65%	-62%	-70%	-64%

7.2.2 Revised Revenue Proposal

AusNet Services accepts:

- The AER's amendments to AusNet Services' opening TAB due to adjustments made to actual capex values in the proposed Roll Forward Model and has made an additional

amendment to the opening TAB to reflect historical capex allocation issues (as discussed in Chapter 10 – Opening RAB of this Revised Revenue Proposal);

- The amendments to remaining tax asset lives for Group 3 assets and assets to which accelerated depreciation applies; and
- The change to the proposed tax treatment of revenue adjustments associated with the efficiency benefit sharing scheme.

However, AusNet Services does not accept the value of imputation credits of 0.4, but instead adopts a value of 0.25. The remainder of this Chapter sets out its reasons for this approach.

The AER's conceptual approach to estimating the value of imputation credits, relying on the pre-personal tax and pre-personal costs value of imputation credits, and the evidence on which it relies to derive its gamma estimate, has not changed from its NSW/ACT decisions made in October 2015. The AER continues to apply an estimate of the value of imputation credits of 0.4, selected from within a range of 0.3 to 0.5.

Since the submission of AusNet Services' Revenue Proposal, the Australian Competition Tribunal (**Tribunal**) has found error in the AER's approach and directed the AER to remake its decisions by reference to a gamma of 0.25.³⁵⁸

The AER contends that there is no consensus among experts on neither the value of imputation credits, nor the techniques to estimate it.³⁵⁹ However, there is consensus in Tribunal decisions that the AER's approach to estimating gamma is in error and that the correct estimate is 0.25.

Most recently, in relation to the distribution rate, the Tribunal found that there was no basis to depart from the use of a market wide estimate of 0.7.³⁶⁰ In relation to theta (referred to by the AER as the "utilisation rate") the Tribunal found that the AER's approach does not estimate the "value" of imputation credits as required by the NER and that the only approach which can be used for that purpose is a market value approach.

The consequence is that the AER's approach to estimating gamma results in an overestimate of the value of imputation credits to equity investors. The deduction from revenues for the value of imputation tax credits is too large with the effect that the return to equity holders will be too small. As a result, AusNet Services will not be able to recover at least its efficient costs, which include a return to equity holders.

It is acknowledged that the AER has sought judicial review of the Tribunal's decision in *Ausgrid* and the other decisions delivered on the same day. The AER has continued to apply its approach in subsequent decisions, contending that the Tribunal decisions on gamma are incorrect.

However, AusNet Services remains of the view that the correct estimate of the value of imputation credits is 0.25 (the product of a distribution rate of 0.7 and theta of 0.35) and that estimate is adopted in this revised proposal. The estimate is based on the post personal tax and personal cost market value of imputation credits to shareholders, consistent with the correct interpretation of the NER, the recent findings of the Tribunal and the most up to date and best estimate of the value of imputation credits.

The remainder of this chapter is structured as follows:

- Section 7.3 provides background on the value of imputation credits;

³⁵⁸ *Applications by Public Interest Advocacy Centre Ltd and Ausgrid* [2016] ACompT 1 (**Ausgrid**), order 1(c), 26 February 2016; *Application by ActewAGL Distribution* [2016] ACompT 4, order 1(d), 26 February 2016; *Applications by Public Interest Advocacy Centre Ltd and Endeavour Energy* [2016] ACompT 2, order 1(c), *Applications by Public Interest Advocacy Centre Ltd and Eessential Energy* [2016] ACompT 3, order 1(c), 26 February 2016; *Application by Jemena Gas Networks (NSW) Ltd* [2016] ACompT 5, order 1(b), 26 February 2016.

³⁵⁹ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 22.

³⁶⁰ *Ausgrid*, [1106].

- Section 7.4 sets out the legislative framework governing the estimation of the value of imputation credits;
- Section 7.5 describes the AER’s approach to estimating the value of imputation credits;
- Section 7.6 sets out AusNet Services’ Revised Revenue Proposal tax allowance and the value of imputation credits; and
- Section 7.7 lists the documents provided to support this chapter.

7.3 Background

Under Australia’s dividend imputation tax system, dividends that are paid out of company profits that have been taxed in Australia have imputation credits attached to them. A proportion of those credits will be redeemed against the domestic personal tax obligations of shareholders who receive them. However credits distributed to non-resident shareholders cannot be redeemed. Further, not all credits distributed to resident shareholders are in fact redeemed.³⁶¹

The National Electricity Rules (NER) provide for the value of imputation credits to be taken into account in estimating the cost of corporate income tax building block, rather than by an adjustment to the return on equity.³⁶² Gamma is the factor used to adjust the estimate of the taxable income (ETI) of the benchmark efficient entity for the value attributed to imputation credits.

Frontier Economics explain the role of gamma in the regulatory settings as follows:

“In the Australian regulatory setting, the regulator estimates the return that investors would require to provide equity capital to the firm and then allows the firm to charge prices so that it is able to pay that return to the investors. In the absence of imputation, this process is straightforward.

Consider, for example, a firm with \$1,000 of equity in is RAB and a required return on equity of 7%. In this case, the equity investors require a return of \$70.³⁶³ The regulator will allow the firm to earn a pre-tax profit of \$100, from which it will pay \$30 corporate tax,³⁶⁴ leaving \$70 to return to shareholders, as required.

Now consider the same example with imputation, and where the regulator has determined that gamma should be set to 0.4, as the AER has done in its recent decisions. In this case, the regulator will allow the firm to earn a pre-tax profit of \$85.37, from which it will pay \$25.61 corporate tax (30%), leaving \$59.76 to distribute to shareholders. The \$25.61 of corporate tax will create \$25.61 of imputation credits that are assumed to have a value of $0.4 \times 25.61 = \$10.24$. Thus, the shareholders receive \$59.76 from the firm plus imputation credits that are assumed to have a value of \$10.24, providing the total return of \$70.00 that is required.

In summary, the return that shareholders would otherwise receive from the firm (\$70.00) is reduced by the regulator’s estimate of the value of imputation credits (\$10.24).³⁶⁵

It is common ground that the value of imputation credits is calculated using the Monkhouse approach, as the product of a distribution rate (payout ratio or F) and theta (which the AER terms the “utilisation rate”). What is not common ground is the approach and evidence relied upon to derive those two parameters.

³⁶¹ SFG: *Estimating gamma for regulatory purposes*, February 2015, [23].

³⁶² NER 6A.6.4.

³⁶³ $7\% \times \$1,000 = \70 .

³⁶⁴ Assuming a 30% corporate tax rate.

³⁶⁵ Appendix 7A – Frontier Economics: An updated dividend drop off estimate of theta, September 2016, at [9] to [12].

This section sets out our approach to estimating the value of imputation credits for the benchmark efficient entity and explains why this approach differs from the AER’s Guideline and the AER’s Draft Decision for AusNet Services.

AusNet Services relies on the following new expert evidence to support its proposed value for gamma of 0.25 which are submitted as Appendices to this Revised Revenue Proposal:

- Appendix 7A – Frontier Economics (September 2016): An updated dividend drop-off estimate of theta.
- Appendix 7B – Frontier Economics (September 2016) – Issues in the estimation of gamma.

7.4 Legislative Framework

The NER 6A.6.4 provides that one of the building blocks for determining the revenue requirement is the estimated cost of corporate income tax to be determined in accordance with NER 6A.6.4.

NER 6A.6.4 specifies the following manner by which the cost of tax is to be estimated:

“The estimated cost of corporate income tax of a service provider for each regulatory year of an access arrangement period (ETCt) is to be estimated in accordance with the following formula:

$$ETCt = (ETIt \times r_t) (1 - \gamma)$$

Where

ETIt is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of prescribed transmission services if such an entity, rather than the Transmission Network Service Provider, operated the business of the Transmission Network Service Provider, such estimate being in accordance with the post-tax revenue model;

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

γ is the value of imputation credits.”

NER 6A.6.2(d)(2) also requires the allowed rate of return to be determined on a nominal vanilla basis that is consistent with the estimate of the value of imputation credits referred to in NER 6A.6.4.

In relation to the estimate of gamma, the AER is required to make its decision in a manner that will or is likely to contribute to the achievement of the national electricity objective (NEO).³⁶⁶ Further, where there are two or more possible decisions that will or will be likely to contribute to the achievement of the NEO, the AER must make the decision that it is satisfied will or is likely to contribute to the NEO to the greatest degree and specify the reasons as to the basis on which that is the case.³⁶⁷

The AER must also take into account the revenue and pricing principles (RPP) set out in section 7A of the NEL.

7.5 The AER’s Approach to Gamma

On 20 July 2016, the AER published its Draft Decision in respect of AusNet Services’ transmission determination for the period 2017/18-2021/22.

The AER’s range for gamma of 0.3 to 0.5 and estimate of the value of imputation credits of 0.4 remains unchanged from its recent decisions (although it is a departure from the point estimate

³⁶⁶ Section 16(1)(a) of the NEL.

³⁶⁷ Section 16(1)(d) of the NEL.

in the Rate of Return Guidelines of 0.5). While the AER has updated its estimates of the distribution rate and its utilisation rate and obtained a new report from Dr Lally, its approach remains the same as that applied in its October 2015 decisions (and subsequently found to be in error by the Tribunal).³⁶⁸ The updated evidence relied upon by the AER in its Draft Decision is set out in the Tables reproduced below:

Table 7.2: Estimates of the value of imputation credits—evidence from all equity

Evidence on utilisation rate	Utilisation rate	Distribution rate	Value of Imputation Credits
Equity ownership approach	0.56 to 0.68	0.7	0.40 to 0.47
Equity ownership approach (Lally recommended distribution rate)	0.56 to 0.68	0.83	0.46 to 0.56 ³⁶⁹
Tax statistics	0.48	0.7	0.34
Tax statistics (Lally recommended distribution rate)	0.48	0.83	0.40

Source: AER analysis; Lally, *Gamma and the ACT Decision*, May 2016, p. 6.

Table 7.3: Estimates of the value of imputation credits—evidence from listed equity

Evidence on utilisation rate	Utilisation rate	Distribution rate	Value of Imputation Credits
Equity ownership approach	0.38 to 0.55	0.75	0.28 to 0.41 ^(a)
Implied market value studies	0 to 1	0.75	0 to 0.75
SFG dividend drop off study	0.35 (0.4) ^(a)		0.26 (0.30) ^(b)

Source: AER analysis.

The central planks of the AER’s approach as reflected in its recent decisions, including the Draft Decision for AusNet Services, are as follows:

1. The AER continues to apply a conceptual approach to estimating gamma which assumes the value of imputation credits reflects a pre-personal tax and pre-personal cost valuation exercise. This approach assumes one dollar of claimed imputation credits has a post company tax value of one dollar to investors before personal taxes and transaction costs. In other words, investors value imputation credits at their full face value. This conceptual definition leads the AER to derive the estimate of gamma as the product of the distribution rate and the utilisation value to investors in the market.
2. In respect of the distribution rate, the AER now considers three subsets of information:
 - a) a market wide (all equity) distribution rate based on the cumulative payout ratio of 0.7 – this is not contentious;
 - b) a listed equity only distribution rate of 0.75; and
 - c) a rate of 0.83 recommended by Dr Lally on the basis of the top 20 ASX firms.
3. In respect of theta (the AER’s “utilisation rate”), the AER:

³⁶⁸ In *Ausgrid*.

³⁶⁹ Lally recommends a gamma estimate of at least 0.5 which is based on a distribution rate of at least 0.83 and a utilisation rate of 0.6. See: M. Lally, *Gamma and the ACT Decision*, May 2016, p. 6.

- a) continues to place most reliance on the equity ownership approach;
 - b) places some reliance on taxation statistics;
 - c) does not accept that these approaches provide nothing more than an upper bound estimate of theta; and
 - d) places very little, if any, weight on market value studies which directly estimate theta.
4. The AER pairs estimates of the distribution rate and its utilisation rate using subsets of all equity and listed equity estimates.
 5. The AER also now introduces into its range an estimate of the gamma preferred by Dr Lally, combining a distribution rate of 0.83 with its equity ownership and tax statistics estimates.
 6. The AER derives a range for gamma of 0.3 to 0.5
 7. The AER chooses a point estimate of 0.4 from its range of 0.3 to 0.5. This point estimate is said to be based primarily on the equity ownership approach, which suggests a value of 0.28 to 0.47. Less reliance is placed on evidence from tax statistics which suggests a value around 0.34. Even less reliance is placed on market value studies which the AER says suggest a value between 0 and 0.75³⁷⁰

The AER and AusNet Services remain divided on these issues and each is addressed below.

7.5.1 Conceptual Approach

The AER continues to base its approach to estimating gamma on a conceptual framework which considers that the value of imputation credits is a post-tax value before the impact of personal taxes and personal costs. The AER considers this conceptual approach to be consistent with the Officer framework and it leads it to view the value of imputation credits as the proportion of company tax returned to investors through the utilisation of imputation credits (the utilisation rate approach).³⁷¹

The AER approach assumes that once the effects of personal tax and costs are excluded, an equity investor who is able to fully utilise imputation credits will value each credit at its full face value.

The AER's conceptual approach was recently considered by the Tribunal in the *Ausgrid* decision. The key findings of the Tribunal were:

- The proper concern is not the extent to which imputation credits may be translated into real money. Instead it involves a determination of the cost of taxation to a network service provider, and the extent to which that cost must be reduced to reflect the impact of the dividend imputation system on the network service provider. The reduction in the cost of income tax represented by gamma reflects the personal taxation benefits (as opposed to other benefits such as dividends) gained by shareholders from holding equity in the network service provider and the value of those benefits as ascribed by shareholders. Consequently it is necessary to consider both the eligibility of investors to redeem imputation credits and the extent to which investors determine the worth of imputation credits to them.³⁷²
- The parties agreed that gamma may be significantly less than the face amount of the distributed credit because they cannot always be utilised by an investor, e.g. foreign

³⁷⁰ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, pp. 29-30.

³⁷¹ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 22.

³⁷² *Ausgrid*, [1061].

investors. However, the networks' position was that shareholders who utilise imputation credits may not value them at their full face amount for reasons such as the time value of money, transaction costs and portfolio effects.

- Such costs are characterised by the AER as personal costs that should not be taken into account because of the requirements for consistency in the Officer framework.³⁷³
- The difficulty with the AER's approach is that:
 - Market value studies of imputation credits suggest that investors may not value cash dividends and eligibility to reduce their income tax liabilities equally.
 - The AER's approach ignores the fact that other parameters in the WACC calculations are market values that already incorporate the effects of the differences in investors' tax positions and transaction costs.
 - There is no inconsistency between the use of market studies to estimate the value of imputation credits and the methods used to calculate other parameters of the costs of debt and equity from market data.
- Importantly: "...the Tribunal does not accept the AER's approach that imputation credits are valued at their claimable amount or face value... The value is not what can be claimed or utilised, but what is claimed or utilised as demonstrated by the behaviour of the shareholder recipients of the imputation credits."³⁷⁴
- The Tribunal found that the AER had not satisfied it that its conception and estimated methods were consistent with the requirements of the NER, including the RPP.³⁷⁵

AusNet Services submitted in its Revenue Proposal that the AER's conceptual approach was not consistent with the NEO and that estimating gamma must be based on an estimation of the value to investors in the benchmark business.³⁷⁶ Frontier Economics illustrate the consequence of applying an approach which does not reflect the value to investors as follows:

"To illustrate the key point of contention in relation to gamma, suppose that the regulator estimates that 40% of all credits that are created will be redeemed and sets gamma on that basis, whereas imputation credits are only valued (in aggregate by the equity market) at 25% of the face amount. In this case, the regulator will reduce the return that the shareholders would otherwise receive by \$10.24, but the credits received by those shareholders would only have a value to them of $0.25 \times 25.61 = \$6.40$. This would result in shareholders being under-compensated as their return is reduced by \$10.24 in relation to credits that are only worth \$6.40 to them."³⁷⁷

AusNet Services' position has been supported by the Tribunal and it remains of the view that the only approach to estimating gamma which complies with the Rules is one which estimates the value equity holders place on imputation credits, after personal tax and after personal costs. This gives rise to an estimation of the theta which is based on market value studies only, as addressed further below.

7.5.2 Distribution Rate

The distribution rate reflects the proportion of imputation credits distributed to equity holders. In its recent decisions the AER changed its approach to estimating the distribution rate from its historic approach and from the approach set out in the Rate of Return Guideline.

³⁷³ *Ausgrid*, [1065]-[1067].

³⁷⁴ *Ausgrid*, [1081].

³⁷⁵ *Ausgrid*, [1084].

³⁷⁶ AusNet Services, *Revenue Proposal*, 30 October 2015, pp. 286, 288-289.

³⁷⁷ Appendix 7A – Frontier Economics: An updated dividend drop-off estimate of theta, September 2016, at [13].

In particular, the AER has departed from its estimate of 0.7 as set out in its Guidelines. In its Draft Decision on AusNet Services' transmission determination, the AER now relies on three different estimates of the distribution rate which it uses in its range for gamma:

- A market wide (all equity) distribution rate of 0.7;
- A listed equity only distribution rate of 0.75; and
- A listed equity distribution rate 0.83 derived by Dr Lally from the financial reports of the top 20 ASX listed firms.

As can be seen from Table 7.4 extracted above, the AER pairs its listed equity distribution rate of 0.75 with its estimates of theta using the equity ownership approach and implied market value studies. The AER combines the Lally ASX listed distribution rate of 0.83 with its equity ownership and tax statistics estimates of the utilisation rate.

It is agreed between the AER and network businesses that the market wide (all equity) distribution rate is 0.7. What is in dispute is whether regard should be had to a subset of listed equity only distribution rates.

The AER obtained a new report from Dr Lally published with its Draft Decision.³⁷⁸ The AER sought Dr Lally's advice on whether estimates of the distribution rate should be based upon the same data as that for theta. Dr Lally advised that, because the distribution rate is a firm specific parameter whereas theta is a market parameter, theta must be estimated using market wide data, while the distribution rate could be estimated using firm, industry or sector wide data according to which was judged to provide the best estimate. Consequently it is not essential to combine or pair the estimates as the AER has done.³⁷⁹ However the AER continues to hold the view that it is open for it to do so.

The AER's reliance on a listed equity subset of the distribution rate is in error because:

- What is required for the purpose of estimating the value of imputation credits under NER 6A.6.4 is the best estimate of the distribution rate for the benchmark efficient entity (BEE).
- The rate is firm specific and different types of firms will have different distribution rates. It follows that all entities should be taken into account in order to derive a market wide distribution estimate.
- The AER's listed equity estimates are dominated by a small number of large multinational firms that are able to attach imputation credits to dividends that are distributed out of foreign sourced income. Firms with significant foreign operations will have higher distribution rates than firms without such operations.
- By definition, the BEE is an Australian firm with no access to foreign income. The AER's reliance on listed equity only is inconsistent with estimating the distribution rate for the BEE. This includes in relation to the estimate provided by Dr Lally of 0.83 based on the top 20 ASX listed firms.
- Frontier Economics demonstrate that the 20 companies in the Lally sample are predominantly large multinationals with a material amount of foreign sourced income which can be used to distribute imputation credits.³⁸⁰ Dr Lally's report relied upon by the AER examines 7 of the 20 firms and concludes that, among the 7 firms, those with relatively more foreign profits had lower imputation credit distribution rates. However, the relevant question is whether large multinationals have higher imputation credit distribution rates than other firms. Further, Frontier Economics show that the analysis of the top 7 firms by Dr Lally did not control for differences in dividend payout ratios.

³⁷⁸ Dr Martin Lally: *Gamma and the ACT Decision*, 23 May 2016.

³⁷⁹ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, pp. 25-26.

³⁸⁰ Appendix 7B – Frontier Economics: *Issues in the estimation of gamma*, September 2016, section 2.

- Frontier Economics conclusion is that:
 - a. *Mathematically, for any given dividend payout ratio, the imputation credit distribution rate is an increasing function of the proportion of foreign profits; and*
 - b. *The evidence clearly supports the proposition that large multinationals are able to distribute a higher proportion of the imputation credits that they create (83%) relative to the average Australian firm (70%).*³⁸¹

An approach which relies on a subset of listed equity estimates of the distribution rate does not give rise to an estimate which is appropriate for or reflective of the BEE and gives rise to an overestimate of the distribution rate. The sample of all equity is less affected by the multinational firms (which comprise a smaller proportion of all equity than of listed equity) and so is more appropriate when estimating the distribution rate for the BEE.

The Tribunal in *Ausgrid* recently considered the AER's approach to the distribution rate, in particular the reliance on listed only estimates. The Tribunal noted that the 'all equity' estimate followed the past practice up to and including the AER's Rate of Return Guideline.

The Tribunal found on review that the AER's basis for relying on a listed equity only distribution rate in the Final Decisions (then 0.8 rather than 0.75 in the AER's Draft Decision for AusNet Services) was not a "sufficient explanation for introducing the alternative measure. It does not explain how the change would be consistent with the NEL or otherwise advance the NEO". The Tribunal concluded that: "At present, the Tribunal is of the view that it is appropriate to follow past practice".³⁸²

The AER now accepts that it is not "necessary" to match estimates of distribution rates and theta (its utilisation rate) from the same data sets, but it considers the choice is open to it and continues to rely on listed equity only estimates. The AER asserts that the recent Tribunal decisions are incorrect and it is acknowledged that the AER has sought judicial review of the decision in *Ausgrid*. At the time of lodgement of this Revised Revenue Proposal, the AER's application has not been heard.

AusNet Services' submission remains that the market wide distribution rate of 0.7 is the only approach that can reflect an estimate of the rate for the BEE and which can be used to estimate the value of imputation credits for the purposes of NER 6A.6.4.

7.5.3 Theta

As noted above, the AER's conceptual approach to gamma leads it to estimate the parameter theta (the "utilisation rate") based on the extent to which investors can utilise the imputation credits they receive to reduce their tax or obtain a refund. This approach assumes imputation credits expected to be utilised are valued at full face value on a post company pre personal tax basis.³⁸³ This interpretation leads the AER to rely primarily on the equity ownership approach to estimate theta and, to some extent, on taxation statistics of redemption rates and to place little, if any, reliance on market value studies. This approach was considered carefully by the Tribunal in *Ausgrid*.

The Conception of Theta – 'Market' Value is not 'Face' Value

The Tribunal in *Ausgrid* noted that the change in the definition of gamma in the National Electricity Rules in 2012 from "assumed utilisation of imputation credits" to "value of imputation

³⁸¹ Ibid at [36].

³⁸² At [1106].

³⁸³ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 35.

credits” did not change gamma’s meaning. Rather the issue in *Ausgrid* was what “value of imputation credits” in (equivalent) NER 6A.6.4 meant.³⁸⁴

The Tribunal found that it is how shareholders act in the market place (as analysed by market studies and dividend drop-off studies), in relation to the utilisation of franking credits available to them, which informs the value of imputation credits.³⁸⁵

There are a number of explanations as to why the value of distributed imputation credits as identified from market-based studies that is reflected in share prices may be less than the face value of those credits:³⁸⁶

- Some of the credits that are distributed to shareholders are never redeemed, including because:
 - credits distributed to non-resident investors cannot be redeemed under the dividend imputation legislation;
 - credits distributed to resident investors who sell the shares within 45 days of their purchase cannot be redeemed (i.e. the 45 day rule); and
 - some credits distributed to resident investors are not redeemed because some investors fail to keep the required records and simply do not claim them;
- There is a time delay (which can be up to two years or more) in obtaining any benefit from imputation credits – whereas dividends are available to the investor as soon as they are paid, the imputation credits that are attached to that dividend only have value after the investor’s end-of-year tax return is filed and processed;
- Due to the administrative costs involved in the redemption of imputation credits;
- Due to the costs of loss of diversification in resident investors’ portfolios who hold more domestic dividend-paying shares than they otherwise would because they are attracted by the possibility of receiving imputation credits.

This difference (between “face value” and “market value”) was acknowledged by the Tribunal and it noted that neither:

- Tax statistics, which:
 - assume a dollar value for each dollar of imputation credits redeemed; and
 - measure the actual rate of redemption of distributed imputation credits by eligible investors from information reported in tax returns; nor
- The equity ownership approach, which:
 - seeks to calculate a value-weighted proportion of domestic investors in the Australian equity market as a reasonable estimate of theta;³⁸⁷
 - assumes that an investor that is eligible to fully utilise imputation credits they receive has a utilisation rate of 1 (i.e. they gain 100 percent of the “value” of the imputation credits) whereas an investor that is ineligible to redeem imputation credits has a utilisation rate of 0 (i.e. they gain no “value” from the imputation credits);³⁸⁸

³⁸⁴ *Ausgrid*, [1025].

³⁸⁵ *Ausgrid*, [1079], [1080].

³⁸⁶ See SFG Consulting (May 2014): *An appropriate regulatory estimate of gamma*, section 2.

³⁸⁷ *Ausgrid*, [1038].

³⁸⁸ *Ausgrid*, [1039].

- uses this dollar value of imputation credits to a relevant class of investors to attempt to estimate the proportion of those investors in the total,³⁸⁹ and
- assumes the value of imputation credits rather than deriving it from market data,³⁹⁰

make any attempt to assess the value of imputation credits to shareholders³⁹¹ or consider the likely existence of factors, such as the 45 day rule, which reduce the ‘value’ of imputation credits to shareholders³⁹² and accordingly can do nothing more than provide upper bounds on the estimate of theta.³⁹³

The Tribunal found that the estimate of theta produced by tax statistics (and to some extent market value studies) was in fact evidence that Australian investors do *not* value imputation credits at their face amount, including because they may be unable to use them.³⁹⁴

The Tribunal accordingly rejected the AER’s submission that it is the amount which is “claimable” or their “face value” or which is “available” for redemption.³⁹⁵ Overall, the Tribunal concluded that the value of gamma is the market value not the face value.

Best Method for determining ‘Value’

The Tribunal noted that the valuation in question may be a complex exercise depending on the inference to be drawn from a range of data sources.³⁹⁶ Ultimately, the Tribunal concluded that because tax statistics and equity ownership approaches could be no better than providing “upper bounds” of the estimate of theta, the assessment must rely on market studies.³⁹⁷ The Tribunal noted this as consistent with methods used for calculating other parameters of the cost of debt and equity from market data.³⁹⁸

The Tribunal concluded that the AER had erred in that it had not satisfied the Tribunal that its conception (as to value) or estimation (as to method) was consistent with the NER, including the revenue and pricing principles.³⁹⁹

Having rejected the conception and estimation of gamma by the AER, the Tribunal adopted the theta estimate in the 2013 SFG Study.⁴⁰⁰ The Tribunal noted that that study represented only one view and that it was faced with selecting between competing views.⁴⁰¹ The Tribunal was satisfied that the SFG point estimate of 0.35 for theta was the best estimate.⁴⁰²

The Tribunal’s decision in *Ausgrid* was based on a 2013 update of the SFG dividend drop off study which had previously been endorsed by the Tribunal in *Application by Energex Limited*

³⁸⁹ *Ausgrid*, [1039].

³⁹⁰ *Ausgrid*, [1043].

³⁹¹ *Ausgrid*, [1095].

³⁹² *Ausgrid*, [1042], [1046], [1095].

³⁹³ *Ausgrid*, [1048], [1095].

³⁹⁴ *Ausgrid*, [1092].

³⁹⁵ *Ausgrid*, [1100].

³⁹⁶ *Ausgrid*, [1082].

³⁹⁷ *Ausgrid*, [1096].

³⁹⁸ *Ausgrid*, [1097].

³⁹⁹ *Ausgrid*, [1084].

⁴⁰⁰ *Ausgrid*, [1118].

⁴⁰¹ *Ausgrid*, [1118]. As set out at [1053], the Network Applicants’ preferred value of gamma was based on the theta estimate of 0.35 from the 2013 SFG Study, which was intended to update the previous 2011 SFG Study, reported and relied upon in *Gamma (No 5)*, which in turn was produced in response to the Tribunal’s concerns with previous studies as expressed in *Gamma (No 2)*.

⁴⁰² *Ausgrid*, [1103].

(Gamma)(No 5) [2011].⁴⁰³ The author of the dividend drop off studies was Professor Stephen Gray (now at Frontier Economics).

Professor Gray has further updated the 2013 dividend drop off study to June 2016. Professor Gray followed the approach adopted in the 2011 and 2013 SFG Reports for compiling the dataset and performing statistical analysis on the dataset. Professor Gray has extended the dataset from the 2013 update through to June 2016 and having undertaken the same analysis concludes that the updated dataset supports an unchanged estimate of theta of 0.35.⁴⁰⁴

The dividend drop off study updated to 2016 reflects the most up to date market value study available using the same approach as endorsed by the Tribunal in previous decisions. AusNet Transmission submits that it is the best estimate of theta currently available and adopts an estimate of 0.35 in this proposal.

AER Response to Tribunal decisions

The AER lists as one of its reasons for selecting a value of imputation credits of 0.4 from within a range of 0.3 to 0.5, that it is consistent with providing regulatory certainty given it is consistent with the value used for all regulatory decisions released in 2015.⁴⁰⁵ However, regulatory certainty is not promoted by the continued use of an approach which has been found by the Tribunal to be in error.

In its Draft Decision the AER sets out its responses to the key comments by the Tribunal in *Ausgrid* (and earlier gamma decisions). The AER's response asserts that the Tribunal erred in relation to the findings about the conceptual framework for gamma. The AER also considers that the Tribunal erred in relation to the relevance of the equity ownership and tax statistics approaches and whether those approaches are upper bounds or whether they reflect the best method to estimate the utilisation rate.

In AusNet Services' view nothing raised by the AER shows that the Tribunal decision in *Ausgrid* or the earlier decision in *Application by Energex Limited (Gamma) No 5* [2011] A CompT 9 is incorrect.

7.5.4 AER Estimates of Equity Ownership Rates

The AER places significant reliance on the equity ownership approach in estimating the utilisation rate because it says:⁴⁰⁶

- It is well aligned with the definition of the utilisation rate in the Monkhouse framework;
- It employs a simple and intuitive methodology;
- It uses a reliable and transparent source of data; and
- It provides estimates of the utilisation rate for investors in both all equity and listed only equity.

The AER's current estimated ranges are:

- 0.56 to 0.68 (all equity); and
- 0.38 to 0.55 (listed equity only).

The AER accepts that there are limitations to the equity ownership approach but does not consider them significant.⁴⁰⁷ AusNet Services disagrees.

⁴⁰³ A CompT 12 May 2011.

⁴⁰⁴ Appendix 7A – Frontier Economics An Updated Dividend Drop Off Estimate of Theta, September 2016, Section 5.

⁴⁰⁵ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 27.

⁴⁰⁶ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 36

The above estimates are slightly lower than the AER's estimates in its Rate of Return Guideline and earlier decisions. The AER's change in ranges since its November 2014 decisions is said to be in part a response to submissions from the networks, SFG and the advice from Handley. The AER:

- No longer relies on estimates of the single domestic ownership share (on the advice of Handley); and
- Now considers only the period since September 2000 rather than data going back to the 1980s.⁴⁰⁸

The equity ownership estimates in the AER's recent decisions are still 16 years old, and as such, could not reflect prevailing conditions in the market. As Professor Gray notes:

- The most recent estimate for listed Australian equity is 44% domestic ownership and it has been more than six years since the estimate was materially above 44%;⁴⁰⁹ and
- The most recent estimate using all equity is 0.58.⁴¹⁰

7.5.5 Tax Statistics

The AER places "a degree" of reliance on tax statistics in arriving at its estimate for gamma but, given limitations with the statistics, less reliance than on equity ownership rates but more than market value studies.⁴¹¹

As confirmed by the Tribunal, redemption rates derived from tax statistics do not take into account factors that result in investors valuing redeemed credits at less than their full face value. The reasons why an investor will value a redeemed credit at less than its full face value were identified by the Tribunal and set out in detail in AusNet Services' initial Revenue Proposal.⁴¹² To summarise, tax rules, transaction costs the time value of money and the portfolio effect mean that the true value of redeemed credits could be less than the full face value.

The Tribunal has confirmed that for these reasons redemption rates derived from tax statistics can only ever indicate the upper bound for the utilisation rate and do not provide direct evidence of the "value" of distributed credits to equity holders.

The AER now estimates the redemption rate from tax statistics to be 0.48, based on updated statistics to the 2014 tax year.⁴¹³ The AER disputes the Tribunal's findings that tax statistics can only provide an upper bound and remains of the view that a point estimate can be used.

The premise for the AER's position is that, based on Dr Lally's advice, tax statistics are unreliable and uncertain and therefore do not reflect an upper bound, nor is the current estimate inconsistent with a higher estimate of gamma than 0.4. However, as Frontier Economics explains, the reliability issue relates to the statistics of credits distributed. Under the AER's conceptual approach, the relevant terms for the purposes of estimating gamma are credits redeemed and credits created and no reliability issues are raised with respect to those terms. The 0.34 upper bound derived from tax statistics is relevant evidence of that upper bound which is unaffected by concerns about the reliability.⁴¹⁴

⁴⁰⁷ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 142.

⁴⁰⁸ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 148.

⁴⁰⁹ *Ibid* at 31.

⁴¹⁰ SFG Consulting: *Estimating gamma for regulatory purposes*, February 2015, 30.

⁴¹¹ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 38.

⁴¹² At 298-299.

⁴¹³ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 150.

⁴¹⁴ Appendix 7B – Frontier Economics: *Issues in the estimation of gamma*, September 2016, section 3.

7.5.6 Market Value Studies

AusNet Services remains of the view that the only method that provides an estimate of the value, as in worth, of distributed imputation credits to equity investors, as required by NER 6A.6.4, is the use of market value studies. This is the approach that complies with the Rules, and results in an estimate of gamma that is consistent with the achievement of the NEO and the considerations required by the RPP. The Tribunal has firmly found that: “*Given that two of the three approaches adapted by the AER are considered no better than upper bounds, it follows that the assessment of theta must rely on market studies*”.⁴¹⁵

The AER says that its re-definition of gamma and re-evaluation of its approach to the utilisation rate has led it to a position of not relying exclusively on market value studies. The AER prefers equity ownership and tax statistic estimates because they provide more direct and simpler evidence of the utilisation rate than market value studies.⁴¹⁶ The Tribunal has found this to be incorrect.

Further, the AER says it does not consider it reasonable to rely exclusively on the results of the SFG dividend drop-off study. The AER has identified what it considers to be a number of limitations on market value studies. In particular:⁴¹⁷

- The studies can produce nonsensical estimates (i.e. greater than one or less than zero);
- The results from market value studies can reflect factors, such as differential personal taxes and risks, which are not relevant to the utilisation rate;
- The results may not be reflective of the value of imputation credits to investors in the market as a whole;
- The studies can be data intensive and employ complex and problematic estimation methodologies; and
- It is only the value of the combined package of dividends and imputation credits that can be observed using dividend drop-off studies and there is no consensus on how to separate the value of dividends from the value of imputation credits (often referred to as the allocation problem).⁴¹⁸

SFG Consulting provided a response as to why the AER’s concerns in its November 2014 decisions do not apply to its 2011 dividend drop off study.⁴¹⁹

In its 2015 decisions, the AER concluded that “*there is reasonable evidence to suggest that several of the limitations do apply to SFG’s dividend drop off study*”.⁴²⁰ Professor Gray responded again to those alleged limitations in his February 2015 report (Frontier Economics).⁴²¹

The AER also asserts that Professor Gray’s drop off studies should be ‘recalibrated’ by dividing them upwards by an amount of 0.05, giving rise to an estimate of around 0.40. The idea of making an adjustment arises from the possibility that investors may value not only imputation credits but also dividends at less than their “face value”. Professor Gray has provided further analysis of whether this is an appropriate adjustment to make. In his June 2015 report (pg. 37),

⁴¹⁵ Ausgrid, [1095].

⁴¹⁶ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 40.

⁴¹⁷ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 40.

⁴¹⁸ AER, *AusNet Services Draft Decision*, July 2016: Attachment 4 – Value of Imputation Credits, p. 40.

⁴¹⁹ SFG, *Estimating Gamma For Regulatory Purposes*, February 2015, pp. 38 – 39.

⁴²⁰ SAPN Preliminary Decision 4-84, JGN Final Decision, 4-86.

⁴²¹ Section 5.3.

Professor Gray reaffirms why no adjustment should be made. The Tribunal in *Ausgrid* accepted that explanation.⁴²²

The AER continues to hold the view that dividend drop off studies are subject to a number of limitations, including Professor Gray's study endorsed by the Tribunal, and that any such estimates need to be adjusted to convert to a pre-personal cost and tax basis. Professor Gray has again responded to the AER's concerns and shows that no such adjustments are necessary.⁴²³

The Tribunal has, for the second time, supported the use of Professor Gray's dividend drop off study for the purposes of estimating theta at 0.35. The study relied upon in the *Ausgrid* decisions had been updated to 2013. As noted above, Professor Gray has further updated the dividend drop off study endorsed by the Tribunal to 2016. Professor Gray concludes that the updated dataset supports an unchanged estimate of theta of 0.35.⁴²⁴

7.6 Revised Revenue Proposal

AusNet Services accepts the AER's Draft Decision on its opening TAB, and applies additional adjustments reflecting improved accuracy of historical capex allocations.

AusNet Services maintains its proposal to apply a value of imputation credits of 0.25, calculated as the product of:

- A distribution rate of 0.70, based on market wide ATO data; and
- A theta of 0.35, based on the (updated) dividend drop off study performed by Professor Stephen Gray and updated to 2016.⁴²⁵

As set out in AusNet Services' Revenue Proposal⁴²⁶ this approach reflects the correct approach to estimating the value of imputation credits which is consistent with the NER. It is also the approach determined to be correct in the recent decisions of the Tribunal (since 2011) and gives rise to the best estimate of gamma presently available.

This proposal is a departure from the AER's Rate of Return Guidelines. The reasons for the departure are set out in detail in this section, and are summarised as follows:

- The Guideline approach misinterprets NER 6A.6.4 and in particular the "value" of imputation credits required to be determined by that Rule;
- Consequently the Guideline estimates the wrong thing, being the utilisation rate;
- The Guideline approach incorrectly and unreasonably places no, or low, reliance on market value studies, which provide a direct estimate of the value of distributed credits consistent with the Rules; and
- Consequently gives rise to an estimate of gamma which is an overestimate of the value actually placed on imputation credits by shareholders.

The AER has also changed from its Guideline approach to the distribution rate. This proposal departs from the AER's approach to the distribution rate in the Draft Decision insofar as the AER has regard to a listed equity subset of estimates.

⁴²² At [11.03].

⁴²³ Appendix 7A – Frontier Economics: *Issues in the estimation of gamma*, September 2016, section 4 and 5.

⁴²⁴ Appendix 7A – Frontier Economics: *An updated dividend drop-off estimate of theta*, September 2016, at [100].

⁴²⁵ Appendix 7A – Frontier Economics: *An updated dividend drop off estimate*, September 2016.

⁴²⁶ AusNet Services, *Transmission Revenue Proposal 2017-22*, October 2015, p. 287.

AusNet Services' Revised Revenue Proposal corporate tax forecast is shown in the Table below.

Table 7.4: Revised Revenue Proposal Tax Allowance (\$m, real 2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
Tax allowance	24.7	21.1	23.1	25.1	18.6	112.6

7.7 Supporting Documents

The following Appendices are provided to support this Chapter:

- Appendix 7A – Frontier Economics: An updated dividend drop-off estimate of theta, September 2016.
- Appendix 7B – Frontier Economics: Issues in the estimation of gamma, September 2016.

The following technical supporting documents are also provided to support this Chapter:

- SFG Consulting (March 2011): Dividend drop-off estimate of theta *Re Application by Energex Limited (No 2) [2010] ACompT7*
- SFG Consulting (June 2013): Updated dividend drop-off estimate of theta, Report for the Energy Networks Association
- SFG Consulting (May 2014): An appropriate regulatory estimate of gamma.
- Tribunal decision in *AusGrid – re Applications by Public Interest Advocacy Centre Ltd and AusGrid* [2016] ACompT1
- Ainsworth, Partington and Warren: Do Franking Credits Matter? May 2015

8 Incentive Schemes

This chapter sets out AusNet Services' response to the Australian Energy Regulator's (AER's) Draft Decision with respect to incentive schemes as set out in Attachments 9, 10 and 11 of the Draft Decision. AusNet Services' initial positions were set out in Chapter 7 of the Revenue Proposal.

In the event of inconsistency between information contained in this chapter and AusNet Services' Revenue Proposal, the information contained in this chapter prevails.

The information set out in this chapter accords with all the applicable requirements of the National Electricity Rules (NER).

8.1 Key points

- AusNet Services adopts the Draft Decision's approach to calculating Service Component targets, caps and collars for the forthcoming period.
- AusNet Services accepts the Draft Decision on the calculation of the Market Impact Component (MIC) parameters and agrees that Frequency Control Ancillary Services constraints applied following a change in AEMO's policy should be excluded during the forthcoming period.
- AusNet Services accepts the Draft Decision in respect of the Network Capability Component.
- AusNet Services accepts the Draft Decision's approach to calculating the Efficiency Benefit Sharing Scheme (EBSS) carryover amount.
- AusNet Services accepts the Draft Decision with respect to the Capital Expenditure Sharing Scheme (CESS).

8.2 Summary

8.2.1 Draft Decision

Service Target Performance Incentive Scheme

The Draft Decision determined Service Component parameters for the forthcoming period based on average performance from 2010-14, but did not accept AusNet Services' proposed adjustments to the Loss of Supply Event Frequency targets. The AER considered the final decision parameters should reflect 2015 data.

The AER determined a placeholder MIC target for the 2017-22 period based on the median five years from 2008-14. The AER considered this target should also be updated to reflect 2015 performance.

The AER also considered Frequency Control Ancillary Services (FCAS) constraints resulting from AEMO operational changes should be excluded from the scheme during the forthcoming period. The AER considered that AEMO's policy could impact materially upon a TNSP and it may be that the TNSP can neither prevent nor reduce the impact of the event by adopting better practices.

The Draft Decision accepted AusNet Services' proposed priority projects and priority project improvement targets.

Efficiency Benefit Sharing Scheme

The AER determined an EBSS carryover amount from the 2014-17 regulatory period of \$5.1 million (real 2016-17), compared to the carryover amount of \$5.6 million proposed by AusNet Services. The AER stated it would update its calculation of the EBSS carryover in the final decision when actual 2015–16 opex is available.

Capital Expenditure Sharing Scheme

The Draft Decision is to apply the CESS consistent with the AER's capital expenditure incentive guidelines to AusNet Services in the forthcoming regulatory period. The AER stated that capex incurred for Network Capability Component (NCC) projects would be excluded from the CESS.⁴²⁷

8.2.2 Revised Revenue Proposal

Service Target Performance Incentive Scheme

AusNet Services adopts the Draft Decision's approach to calculating Service Component targets, caps and collars for the forthcoming period. Accordingly, AusNet Services has updated its proposal to include 2015 performance data and calculated targets, caps and collars based on average performance from 2011-15.

AusNet Services accepts the Draft Decision on the calculation of MIC parameters. Accordingly, AusNet Services has updated its proposal to include 2015 performance data and calculated its proposed target for the forthcoming period based on the average of the median five years of performance from 2009-15.

AusNet Services agrees with the AER that FCAS constraints applied following a change in AEMO's policy (F_S+LREG_0035 and F_S+RREG_0035) should be excluded during the forthcoming period because they would materially impact its performance under the scheme and are outside of its ability to control. AusNet Services also considers that all constraints intended to manage power system frequency in South Australia should be excluded from its performance during the forthcoming period.

AusNet Services accepts the Draft Decision in respect of the NCC.

Efficiency Benefit Sharing Scheme

AusNet Services accepts the Draft Decision's approach to calculating the EBSS carryover. AusNet Services' proposes a carryover amount of \$1 million (real 2016-17). This carryover amount reflects actual 2015-16 opex.

Capital Expenditure Sharing Scheme

AusNet Services accepts the AER's decision with respect to the CESS.

The remainder of this chapter is structured as follows:

- Section 8.3 sets out AusNet Services response on the Service Target Performance Incentive Scheme;
- Section 8.4 addresses the EBSS carryover amount and exclusions;
- Section 8.5 deals with the Capital Expenditure Sharing Scheme; and
- Section 8.6 lists the supporting documents that are relevant to this Chapter.

⁴²⁷ AER, *AusNet Services Draft Decision*, July 2016: Attachment 9 – Capital expenditure sharing scheme, p. 7.

8.3 Service Target Performance Incentive Scheme

The Service Target Performance Incentive Scheme (STPIS) comprises the following three components:

- The Service Component;
- The Market Impact Component (MIC); and
- The Network Capability Component (NCC).

8.3.1 Service Component

Draft Decision

Targets

The AER determined targets for each Service Component parameter for the forthcoming period based on average performance from 2010-14, except for the three proper operation of equipment sub-parameters. The AER considered the final decision targets should be based on 2011-15 data.

The Draft Decision did not approve AusNet Services' proposed adjustments to the Loss of Supply Event Frequency targets to apply in the forthcoming period. This adjustment was proposed to reflect the reduction in reliability expected to occur as a result of the 2014 decrease in the Value of Customer Reliability. The AER considered that:

- AusNet Services did not demonstrate that there is a clear link between the VCR/Capex and loss of supply event frequency; and
- The method for calculating the impact of VCR to loss of supply event frequency is inappropriate or not supported by evidence.

Caps and collars

The AER determined caps and collars for each Service Component parameter for the forthcoming period, except for the three proper operation of equipment sub-parameters. The AER applied the Kolmogorov-Smirnov (K-S) fit statistic to 2010-14 data to determine its preferred distributions and set caps and collars equal to the 5th and 95th percentiles, respectively. As with targets, the AER considered the final decision caps and collars should be based on 2011-15 data.

The AER considered that the K-S statistic was the most appropriate fit statistic, in contrast to AusNet Services' Revenue Proposal, which used a combination of the K-S and Anderson-Darling (A-D) fit statistics. The AER stated:

*"The K-S distance statistic is based on the maximum difference between the sample distribution and the test distribution. As a refinement, the A-D statistic gives more weight to the tails of the distribution than the K-S test does. We consider the K-S fit statistic is to be preferred due to its simplicity, especially when there is no evidence to suggest the A-D fit statistic is more appropriate in this particular case. Further, with only 5 data points being available, we consider placing more weight at the tail end by using the A-D statistical fit to be unsound."*⁴²⁸

The Table below sets out the Draft Decision on Service Component targets, caps and collars and preferred distributions.

⁴²⁸ AER, *AusNet Services Draft Decision*, July 2016: Attachment 11 – Service target performance incentive scheme, p. 15.

Table 8.1: Draft Decision on Service Component parameter values, reproduced

Parameter	Distribution	Cap (5th percentile)	Targets	Floor (95th percentile)
Average circuit outage rate				
Lines event rate – fault	Uniform	0.1406	24.98%	0.3525
Transformer event rate – fault	ExtValueMin	0.0073	19.06%	0.3160
Reactive plant event rate – fault	Uniform	0.2196	36.00%	0.5089
Lines event rate – forced	Normal	0.1192	14.67%	0.1742
Transformer event rate – forced	ExtValueMin	0.0621	10.92%	0.1456
Reactive plant event rate – forced	Uniform	0.1004	26.86%	0.4282
Loss of supply events				
Number of events greater than 0.05 system minutes per annum	Poisson	0	2	5
Number of events greater than 0.30 system minutes per annum	Poisson	0	0	2
Average outage duration	InvGauss	3.8981	74.0311	302.3258

Source: AER, AusNet Services Draft Decision, Attachment 11 – Service target performance incentive scheme, July 2016, pp. 15-16.

Response to Draft Decision

AusNet Services adopts the Draft Decision’s approach to calculating Service Component targets, caps and collars for the forthcoming period. Accordingly, AusNet Services has:

- Calculated targets based on average performance from 2011-15; and
- Used the K-S fit statistic to set caps and collars equal to the 5th and 95th percentiles of the best fit distribution, except in cases where this differs to the AER’s preferred distribution.

AusNet Services does not agree with the AER’s reasons for rejecting its proposed adjustments to the Loss of Supply Event Frequency targets. However, because the average of 2011-15 data produces identical targets to those applying in the current period, AusNet Services is not proposing a similar adjustment in this Revised Revenue Proposal. AusNet Services encourages the AER to address the case where a TNSPs performance is approaching the performance frontier in its next STPIS review.

The Table below sets out AusNet Services’ proposed Service Component targets, caps and collars and distributions. Appendix 8A sets out the analysis underpinning the proposed values. As required by Clause 3.2 of the STPIS, AusNet Services has included values for the three proper operation of equipment sub-parameters.

Table 8.2: Proposed Service Component parameter values

Parameter	Sub-parameter	Distribution	Cap	Target	Collar
Unplanned outage circuit event rate	Lines event rate – fault	Weibull	16.0%	25.4%	33.8%
	Transformer event rate – fault	Weibull	9.2%	20.3%	31.8%
	Reactive plant event rate – fault	Pearson5	18.4%	34.3%	61.2%
	Lines event rate – forced	Weibull	12.3%	15.0%	17.1%
	Transformer event rate – forced	Weibull	6.1%	10.4%	14.4%

Parameter	Sub-parameter	Distribution	Cap	Target	Collar
	Reactive plant event rate – forced	Weibull	19.9%	30.9%	40.7%
Loss of Supply Event Frequency	Number of events greater than 0.05 system minutes per annum	Poisson	0	2	5
	Number of events greater than 0.30 system minutes per annum	Poisson	0	1	2
Average Outage Duration	Average outage duration	Lognormal	3.4	75.1	334.2
Proper Operation of Equipment	Failure of protection system	Poisson	23.0	32.0	42.0
	Material failure of SCADA	Poisson	0.0	1.8	4.0
	Incorrect operational isolation of primary or secondary equipment	Poisson	2.0	5.6	10.0

Source: AusNet Services

8.3.2 Market Impact Component

Draft Decision

Market Impact Component parameters

The AER determined a placeholder MIC target for the 2017-22 period of 1,603 dispatch intervals (DIs), and an unplanned outage event limit of 272, based on an average of the median five years of performance from 2008-14. The AER stated that the performance target to apply from April 2017 will be based on average performance of the median five years from 2009–15.⁴²⁹

FCAS constraints arising from AEMO operational changes

The AER also determined that it would exclude Frequency Control Ancillary Services (FCAS) constraints arising from AEMO operational changes from AusNet Services' performance measure, using the force majeure clause of the STPIS. The AER considered that AEMO's policy could impact materially upon a TNSP and it may be that the TNSP can neither prevent nor reduce the impact of the event by adopting better practices. The AER stated:

"Given these factors, in the present circumstances it is appropriate to exclude F_S+LREG_0035 and F_S+RREG_0035) at this stage. We will review AusNet Services' ability to mitigate the impact of the policy in the annual compliance review process and may further reassess the setting of AusNet Services' targets at the end of 2017–22 regulatory control period. AusNet Services should continue to investigate practical approaches to mitigate the impact of the operational change."⁴³⁰

Response to Draft Decision

Market Impact Component parameters

AusNet Services accepts the Draft Decision on the calculation of MIC parameters. Accordingly, AusNet Services has calculated its proposed target for the forthcoming period based on the average of the median five years of performance from 2009-15.

⁴²⁹ AER, AusNet Services Draft Decision, July 2016: Attachment 11 – Service target performance incentive scheme, p. 17.

⁴³⁰ AER, AusNet Services Draft Decision, July 2016: Attachment 11 – Service target performance incentive scheme, p. 17.

In accordance with version 5 of the STPIS, the proposed cap and collar are equal to zero and twice the performance target, respectively, while the unplanned outage event limit is equal to 17% of the target.

The Table below sets out AusNet Services' proposed MIC parameters.

Table 8.3: Proposed Market Impact Component parameters

Calendar year	Adj. performance measure
2009	1,417
2010	2,134
2011	2,687*
2012	909
2013	745*
2014	852
2015	966
Parameter	Dispatch intervals
Target	1,256
Cap	0
Collar	2,511
Unplanned outage event limit	213

Source: AusNet Services

* Not included in target calculation

In calculating the adjusted performance measure data shown above, AusNet Services has applied the unplanned outage event limit to individual events, rather than to annual total DIs attributable to unplanned outages. AusNet Services considers this is consistent with the AER's intent when introducing the unplanned outage event limit, which was to ensure a TNSP would continue to face an incentive to minimise its market impact following a large unplanned outage event.

Because the scheme is unclear as to how the unplanned outage event limit should be applied, AusNet Services requests that the AER clarify this matter in the Final Decision.

Frequency constraints arising from AEMO operational changes

AusNet Services accepts the Draft Decision on treatment of FCAS constraints arising from AEMO operational changes. AusNet Services agrees with the AER that these constraints should be excluded during the forthcoming period because they are outside of its ability to control and would materially impact its performance under the scheme.

The Draft Decision states the F_S+LREG_0035 and F_S+RREG_0035 constraints will be excluded 'at this stage'.⁴³¹ While it is clear that these constraints will be excluded from the 2017-22 MIC target, AusNet Services would welcome clarification in the Final Decision that these constraints will also be excluded from annual performance under the Force Majeure exclusion clause.

Furthermore, due to ongoing developments in AEMO's approach to controlling power system security in South Australia, there may be alternative or additional constraints introduced in the forthcoming period that materially affect AusNet Services' performance. These could include further FCAS constraints as well as other types of constraints (e.g. Rate of Change of Frequency constraints).

⁴³¹ AER, AusNet Services Draft Decision, July 2016: Attachment 11 – Service target performance incentive scheme, p. 17.

In these circumstances, AusNet Services considers that new or changed constraints introduced by AEMO to manage power system frequency in South Australia – which would not be captured in AusNet Services' target – should be excluded from its performance during the forthcoming period through the application of the force majeure exclusion. This would be consistent with the AER's position to exclude the F_S+LREG_0035 and F_S+RREG_0035 constraints, which is intended to ensure AusNet Services' performance is not materially impacted by AEMO operational changes that are outside of AusNet Services' ability to control or mitigate.

8.3.3 Network Capability Component

Draft Decision

The Draft Decision accepted AusNet Services' proposed priority projects and priority project improvement targets. The priority projects have a value of \$125,000 (real 2016/17).⁴³²

Response to Draft Decision

AusNet Services the Draft Decision in respect of the NCC.

8.4 Efficiency Benefit Sharing Scheme

8.4.1 Draft Decision

EBSS carryover amount from the 2014–17 regulatory period

The AER determined an EBSS carryover amount from the 2014-17 regulatory period of \$5.1 million (real 2016-17), compared to the carryover amount of \$5.6 million proposed by AusNet Services.

The Draft Decision:⁴³³

- Used unlagged March quarter CPI to convert nominal values to real 2016-17, rather than the lagged September quarter CPI used by AusNet Services; and
- Estimated final year opex using a different formula to AusNet Services.

The AER stated it would update its calculation of the EBSS carryover in the final decision when actual 2015–16 opex is available.

Application of the EBSS in the 2017-22 period

The Draft Decision approved the following exclusions from the EBSS to apply in the forthcoming period:⁴³⁴

- Easement land tax;
- Debt raising cost;
- Rebates under the availability incentive scheme; and
- The costs of priority projects approved under the NCC.

The Draft Decision did not approve AusNet Services' proposal to exclude self-insurance costs. The AER considered that because it forecast these costs using revealed expenditure in a single year, they should not be excluded from the EBSS.⁴³⁵

⁴³² AER, *AusNet Services Draft Decision*, July 2016: Attachment 11 – Service target performance incentive scheme, p. 18.

⁴³³ AER, *AusNet Services Draft Decision*, July 2016: Attachment 9 – Efficiency benefit sharing scheme, pp. 10-12.

⁴³⁴ AER, *AusNet Services Draft Decision*, July 2016: Attachment 9 – Efficiency benefit sharing scheme, pp. 13-15.

⁴³⁵ AER, *AusNet Services Draft Decision*, July 2016: Attachment 9 – Efficiency benefit sharing scheme, p. 14.

8.4.2 Response to Draft Decision

EBSS carryover amount from the 2014–17 regulatory period

AusNet Services accepts the Draft Decision’s approach to calculating the EBSS carryover. AusNet Services’ proposes a carryover amount of \$1 million (real 2016-17). This carryover amount reflects actual 2015-16 opex and has been calculated using the correct final year opex formula.

Table 8.4: Proposed EBSS carryover amount (real 2016-17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
EBSS carryover amounts	1.3	1.3	1.3	0.0	-3.0	1.0

Source: AusNet Services

The inputs and calculations used to determine the proposed carryover amount have been provided as a supporting document.

AusNet Services notes that the opex amounts in the AER’s EBSS model relate to the self-insurance allowance approved for the current period, rather than self-insurance. This contrasts with the Draft Decision opex model, where the AER has left self-insurance losses in the base year (discussed in Chapter 4: Operating and Maintenance Expenditure).

Accordingly, the AER has treated self-insurance costs correctly in its EBSS decision, but not in its opex decision. AusNet Services considers the correct treatment should also be applied in the opex forecast to ensure the AER’s decision is internally consistent.

Application of the EBSS in the 2017-22 period

AusNet Services accepts the EBSS exclusions set out in the Draft Decision, with the exception of self-insurance. As discussed in Chapter 4: Operating and Maintenance Expenditure, AusNet Services is proposing a category-specific forecast of self-insurance. On this basis, self-insurance costs should be excluded from the EBSS.

8.5 Capital Expenditure Sharing Scheme

8.5.1 Draft Decision

The Draft Decision is to apply the CESS consistent with the AER’s capital expenditure incentive guidelines to AusNet Services in the forthcoming regulatory period. The AER stated that capex incurred for NCC projects would be excluded from the CESS.⁴³⁶

8.5.2 Response to Draft Decision

AusNet Services accepts the AER’s decision with respect to the CESS.

⁴³⁶ AER, *AusNet Services Draft Decision*, July 2016: Attachment 9 – Capital expenditure sharing scheme, p. 7.

8.6 Supporting Documents

The following Appendices are provided to support this Chapter:

- Appendix 8A – Fitting probability distributions to Service Component data.

A completed Market Impact Component data template for 2015 is also provided as a technical supporting document.

9 Cost Pass Through

This chapter sets out AusNet Services' response to the Australian Energy Regulator's (AER's) Draft Decision with respect to cost pass through events as set out in Attachment 13 of the Draft Decision. AusNet Services' initial positions were set out in Chapter 12 of the Revenue Proposal.

In the event of inconsistency between information contained in this chapter and AusNet Services' Revenue Proposal, the information contained in this chapter prevails.

9.1 Key points

- AusNet Services accepts the Draft Decision with respect to the terrorism event.
- AusNet Services proposes minor drafting changes to the following nominated cost pass through events:
 - Insurer credit risk event;
 - Insurance cap event; and
 - Natural disaster event.
- AusNet Services accepts the Draft Decision on the Decommissioning of Point Henry – Geelong Terminal Station 220kV Lines Event, and welcomes clarification in the Final Decision that the event is covered by the prescribed pass through events in the NER.
- C-I-C

9.2 Summary

9.2.1 Draft Decision

The AER accepted AusNet Services' proposed definition of an insurer credit risk event. The AER also accepted the following proposed pass through events, subject to minor amendments to align the event definitions with those approved for AusNet Services' 2016-20 electricity distribution determination.

- Terrorism event;
- Insurance cap event; and
- Natural disaster event.

The AER did not accept the following two nominated pass through events proposed by AusNet Services:

- Decommissioning of Point Henry – Geelong Terminal Station 220kV Lines Event; and
- C-I-C

9.2.2 Revised Revenue Proposal

- AusNet Services accepts the Draft Decision with respect to the terrorism event.
- AusNet Services proposes minor drafting changes to the following nominated cost pass through events:
 - Terrorism event;
 - Insurance cap event; and

- Natural disaster event.

AusNet Services accepts the Draft Decision on the Decommissioning of Point Henry – Geelong Terminal Station 220kV Lines Event, and welcomes clarification in the Final Decision that the event is covered by the prescribed pass through events.

AusNet Services does not accept the AER’s rejection of the proposed FBTS lease event.

The remainder of this chapter is structured as follows:

- Section 9.3 discusses the pass through events the AER accepted; and
- Section 9.4 addresses the pass through events the AER did not accept.

9.3 Pass through events the AER accepted

9.3.1 Insurer credit risk event

Draft Decision

The AER accepted AusNet Services’ proposed definition for an insurer credit risk event.

Revised Revenue Proposal

AusNet Services proposes the following minor amendments to the Draft Decision with respect to an insurer credit risk event:

“An insurer’s credit risk event occurs if:

A nominated insurer of AusNet Services is unable to pay a claim ~~becomes insolvent~~ and as a result, in respect of an existing, or potential, claim for a risk that was insured by that insurer ~~the insolvent insurer~~, AusNet Services:

- 1. is subject to a materially higher or lower claim limit or a materially higher or lower deductible than would have otherwise applied under that insurer’s ~~the insolvent insurer’s~~ policy; or*
- 2. incurs additional costs associated with self-funding an insurance claim, which would otherwise have been covered by that insurer ~~the insolvent insurer~~.*

Note: In assessing an insurer’s credit risk event pass through application, the AER will have regard to, amongst other things:

- i. AusNet Services’ attempts to mitigate and prevent the event from occurring by reviewing and considering the insurer’s track record, size, credit rating and reputation; and*
- ii. in the event that a claim would have been made after the insurance provider became insolvent or was otherwise unable to pay a claim, whether AusNet Services had reasonable opportunity to insure the risk with a different provider.”*

AusNet Services considers the definition being proposed in this Revised Revenue Proposal improves upon that accepted in the Draft Decision because it more accurately describes an event in which AusNet Services is adversely affected by an insurer’s financial incapacity.

The term “insolvent” is defined as an inability to pay debts as and when they are due. Because it may not be clear that an insurance claim qualifies as a debt, the proposed changes link the trigger event with an insurer becoming unable to pay a claim, rather than with insolvency.

Accordingly, the proposed drafting better achieves the intent of the insurer credit risk event, which is to ensure AusNet Services is able to recover at least its efficient costs in the event of an insurer being unable to make good on a claim.

AusNet Services notes that the insurer credit risk event definition being proposed in this Revised Revenue Proposal differs slightly to the definition approved by the AER in its final decision for AusNet Services’ 2016-20 electricity distribution price review. While AusNet Services agrees with the AER that, where possible, cost pass through event definitions should be consistent between its transmission and distribution networks, AusNet Services

considers that, in this instance, the benefits of clarification outweigh the potential benefits of consistency.

9.3.2 Terrorism event

Draft Decision

The AER accepted AusNet Services proposed definition for a terrorism event, subject to minor amendments to align the event definition with that approved for AusNet Services' 2016-20 electricity distribution determination.

Revised Revenue Proposal

AusNet Services accepts the Draft Decision with respect to a terrorism event and therefore adopts the following definition of a terrorism event in this Revised Revenue Proposal:

"A terrorism event occurs if:

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 or 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 increases the costs to AusNet Services in providing prescribed transmission services.

Note: In assessing a terrorism event pass through application, the AER will have regard to, amongst other things:

- i. whether AusNet Services has insurance against the event;*
- ii. the level of insurance that an efficient and prudent NSP would obtain in respect of the event; and*
- iii. whether a declaration has been made by a relevant government authority that an act of terrorism has occurred."*

9.3.3 Insurance cap event

Draft Decision

The AER accepted AusNet Services proposed definition for an insurance cap event, subject to minor amendments to align the event definition with that approved for AusNet Services' 2016-20 electricity distribution determination.

Revised Revenue Proposal

AusNet Services proposes the following minor amendments to the Draft Decision with respect to an insurance cap event, to improve the clarity of the drafting:

"An insurance cap event occurs if:

- 1. AusNet Services makes a claim or claims and receives the benefit of a payment or payments under a relevant insurance policy;*
- 2. AusNet Services incurs costs beyond the relevant policy limit; and*
- 3. the costs beyond the relevant policy limit materially increase the costs to AusNet Services in providing prescribed transmission services.*

For this insurance cap event:

- 4. a relevant insurance policy is an insurance policy held during the 2017–22 regulatory control period or held during a previous regulatory control period in which AusNet Services was registered under the NER as a TNSP regulated.*

Note: in making a determination on an Insurance Cap Event, the AER will have regard to, amongst other things:

- i. the relevant insurance policy for the event; and
- ii. the level of insurance that an efficient and prudent TNSP would obtain in respect of the event; and
- iii. any assessment by the AER of AusNet Services' insurance in making its transmission determination for the relevant period."

9.3.4 Natural disaster event

Draft Decision

The AER accepted AusNet Services' proposed definition for a natural disaster event, subject to minor amendments to align the event definition with that approved for AusNet Services' 2016-20 electricity distribution determination.

Revised Revenue Proposal

AusNet Services proposes the following minor amendments to the Draft Decision with respect to a natural disaster event to ensure the event achieves its intended purpose:

"Natural Disaster Event means any natural disaster including but not limited to fire, flood or earthquake that leads to loss or damage occurs during the 2017-22 regulatory control period that increases the costs to AusNet Services in providing prescribed transmission services, provided the fire, flood or other event was not a consequence of the acts or omissions of the service provider.

Note: In assessing a Natural Disaster Event pass through application, the AER will have regard to, amongst other things:

- i. whether AusNet Services has insurance against the event; and
- ii. the level of insurance that an efficient and prudent NSP would obtain in respect of the event."

AusNet Services considers the definition being proposed in this Revised Revenue Proposal improves upon that accepted in the Draft Decision because it allows AusNet Services to recover the efficient costs of a natural disaster regardless of when that natural disaster occurred. The recovery of efficient costs promotes efficient investment and operation of networks, leading to better price and service outcomes for consumers.

Under the drafting approved in the Draft Decision, the trigger event is a natural disaster occurring in the 2017-22 period. Accordingly, the event approved in the Draft Decision does not capture in its scope a natural disaster occurring in previous regulatory periods that results in losses or damages in the 2017-22 period.

The window in which a cost pass through event may occur but a service provider is unable to recover the associated efficient costs was explored by the AEMC when it reviewed and amended the cost pass through provisions applying to electricity network service providers in 2012. The AEMC referred to this window as the 'dead zone'.⁴³⁷

The AEMC's final rule change resulted in these provisions being amended such that NSPs are able to recover costs incurred outside of the period in which the event occurs. Specifically, NER 6A.7.3 (j) was amended to:

"(j) In making a determination under paragraph (d) or (g) in respect of a Transmission Network Service Provider, the AER must take into account:

⁴³⁷ AEMC, *National Electricity Amendment (Cost pass through arrangements for Network Service Providers) Rule 2012 – Rule Determination*, August 2012, pp. 26-29.

- (1) the matters and proposals set out in any statement given to the AER by the Transmission Network Service Provider under paragraphs (c) or (f) (as the case may be);
- (2) in the case of a positive change event, the increase in costs in the provision of prescribed transmission services that, as a result of the positive change event, the Transmission Network Service Provider has incurred and is likely to incur until:
- (i) unless subparagraph(ii) applies – the end of the regulatory control period in which the positive change event occurred; or
 - (ii) if the transmission determination for the regulatory control period following that in which the positive change event occurred does not make any allowance for the recovery of that increase in costs – the end of the regulatory control period following that in which the positive change event occurred [Emphasis added];”**

While the AEMC’s intent in amending the provisions was to “remove a known anomaly from the drafting of the current rules and ... enable consistent treatment of pass through events, whenever they occur”,⁴³⁸ NER 6A.7.3 (j)(ii) appears to limit the window during which the costs of a pass through event may be recovered to the end of the regulatory period following that in which the event occurred.

The current drafting of the Rules, therefore, may preclude a service provider from recovering losses or damages caused by a natural disaster where the losses or damages are incurred outside of this window. This circumstance is less likely, but is still a conceivable outcome. As stated by the AEMC, such an outcome would be contrary to the Revenue and Pricing Principles:

“Further, allowing NSPs the opportunity to recover the costs incurred when a pass through event occurs during the ‘dead zone’ is consistent with the revenue and pricing principles under section 7A(2) of the NEL, as the NSP is provided a reasonable opportunity to recover at least the efficient costs it incurs in providing network services.

Where NSPs are better able to recover their efficient costs, it promotes the efficient operation of the incentives on NSP’s to invest in their network assets.”⁴³⁹

In contrast, AusNet Services’ proposed drafting, by linking the trigger to the loss or damage itself rather than the regulatory period in which the event occurs, ensures that the recovery of losses or damages caused by a natural disaster is not limited by the window set out in the NER. This is consistent with the intent of the AEMC, which was to provide the AER with the ability to approve efficient cost pass through amounts regardless of when the cost pass through event occurred:

“As noted in the draft rule determination, it was the intention of these arrangements to allow NSPs to recover the costs of a pass through event over a number of years. Whether these costs are recovered over one regulatory control period, or multiple regulatory control periods should appropriately be determined by the AER.”⁴⁴⁰

Accordingly, AusNet Services considers its proposed natural disaster event drafting aligns with both the AEMC’s intent in drafting the current pass through provisions and the Revenue and Pricing Principles.

As discussed above in relation to the insurer credit risk event, AusNet Services notes that the natural disaster definition being proposed in this Revised Revenue Proposal differs slightly to the definition approved by the AER in its final decision for AusNet Services’ 2016-20 electricity distribution price review. While AusNet Services agrees with the AER that, where possible, cost

⁴³⁸ AEMC, *National Electricity Amendment (Cost pass through arrangements for Network Service Providers) Rule 2012 – Rule Determination*, August 2012, p. 28.

⁴³⁹ AEMC, *National Electricity Amendment (Cost pass through arrangements for Network Service Providers) Rule 2012 – Rule Determination*, August 2012, p. 28.

⁴⁴⁰ AEMC, *National Electricity Amendment (Cost pass through arrangements for Network Service Providers) Rule 2012 – Rule Determination*, August 2012, p. 28

pass through event definitions should be consistent between its transmission and distribution networks, AusNet Services considers that, in this instance, the benefits of clarification outweigh the potential benefits of consistency.

9.4 Pass through events the AER did not accept

9.4.1 Decommissioning of Point Henry – Geelong Terminal Station 220kV Lines Event

Draft Decision

The AER did not accept AusNet Services' proposed Decommissioning of Point Henry – Geelong Terminal Station 220kV Lines Event. The AER considered this event would be triggered by a requirement imposed by a relevant authority and would, therefore, likely be covered by the prescribed cost pass through events.⁴⁴¹

Response to Draft Decision

AusNet Services accepts the Draft Decision with respect to the Decommissioning of Point Henry – Geelong Terminal Station 220kV Lines Event.

The Draft Decision states that the event would 'likely' be covered by either the prescribed service standard event or regulatory change event. AusNet Services would welcome clarification in the Final Decision that the AER considers the event would unambiguously be covered by at least one of the prescribed cost pass through events.

It is important that there is a clear understanding of the events that are covered by cost pass through protection at the start of the regulatory period. Therefore, unless the AER can clarify that the Decommissioning of Point Henry – Geelong Terminal Station 220kV Lines Event is unambiguously covered by either the prescribed service standard or regulatory change events, then AusNet Services retains its proposal to include this event as a nominated cost pass through event.

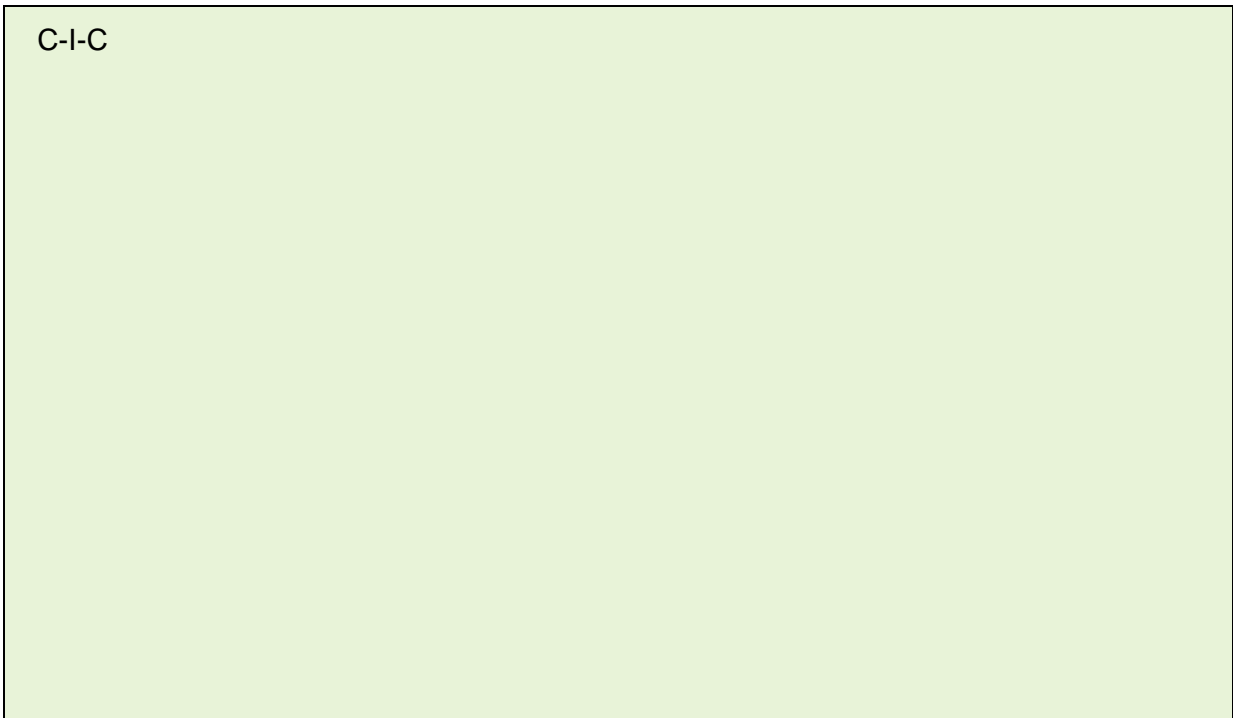
9.4.2 C-I-C

Draft Decision

C-I-C

⁴⁴¹ AER, *AusNet Services Draft Decision*, Attachment 13 – Pass through events, July 2016, p. 16.

Box 9.1: C-I-C



Response to Draft Decision

C-I-C

C-I-C

C-I-C

C-I-C

C-I-C

10 Regulatory Asset Base

This chapter sets out AusNet Services' response to the Australian Energy Regulator's (AER's) Draft Decision with respect to the Opening Regulatory Asset Base (RAB) as set out in Attachment 2 – Regulatory Asset Base. AusNet Services' initial positions were set out in Chapter 8 – Opening Regulatory Asset Base of the Revenue Proposal.

In the event of inconsistency between information contained in this chapter and AusNet Services' Revenue Proposal, the information contained in this chapter prevails.

10.1 Introduction

The AER has determined AusNet Services' opening RAB value as at 1 April 2017 to be \$3,194.7m (nominal), representing a reduction of \$34.0m, or 1.1% from the opening RAB value of \$3,228.7m (nominal) in AusNet Services' Revenue Proposal. This change is due to adjustments made by the AER, including:

- Applying the standard partially-lagged approach for RAB indexation;
- Adjusting for the movements in capitalised provisions when adding actual capex to the RAB;
- Amending the asset class allocation of as-commissioned capex for 2013-14 and 2014-15; and
- Accounting for asset disposal values based on gross proceeds from sale of assets.

In summary, this Revised Revenue Proposal:

- Accepts the AER's amendments to inflation inputs in the Roll Forward Model (RFM) and associated adjustments within AusNet Services' straight-line depreciation schedule;
- Makes minor adjustments to opening RAB to reflect corrected historical capex allocation;
- Provides further information and clarification on its 'Inventory' capex allocations for 2013-14 and 2014-15, in response to questions raised by the AER during this review; and
- Provides further information and clarification on movements in capitalised provisions for 2013-14 and 2014-15 to correct gross capex inputs contained in the Draft Decision RFM.

This chapter is structured as follows:

- Section 10.2 sets out AusNet Services' calculation of the opening RAB at the start of the forthcoming regulatory control period, 1 April 2017, including:
 - An overview of AusNet Services' approach to establishing the opening RAB at 1 April 2017;
 - Opening RAB adjustments due to correcting historical inventory capex allocation; and
 - Required adjustments to gross capital expenditures for movements in provisions.
- Section 10.3 sets out AusNet Services' proposed RAB roll forward into the forthcoming regulatory control period, which reflects AusNet Services' forecast capital expenditure and depreciation.

10.2 Roll Forward of 2014 Regulatory Asset Base to 1 April 2017

10.2.1 RAB Roll Forward Overview

As shown in the Table below, the proposed opening RAB value as at 1 April 2017 (prior to roll-in of Group 3 assets) in nominal dollars is \$3,082.2 million.

Table 10.1: Revised Revenue Proposal opening RAB value (As Incurred) as at 1 April 2017 (\$m, nominal)

Regulatory year (commencing 1 April)	2014/15	2015/16	2016/17
Opening RAB	\$2,876.0	\$2,948.1	\$2,985.0
Net Capital expenditure excluding Group 3	\$151.3	\$145.1	\$181.4
Opening RAB inflation addition	\$66.4	\$44.3	\$49.3
Nominal Straight line depreciation	-\$145.6	-\$152.5	-\$161.2
Interim Closing RAB – excluding final year adjustments	\$2,948.1	\$2,985.0	\$3,054.5
Difference Between Forecast and Actual Net Capex for the 2013/14 regulatory year			\$20.0
Return on 2013/14 Net Capex difference			\$4.6
Difference Between Actual and Forecast Group 3 Asset Roll in at 1 April 2014			\$0.2
Return on Difference – Group 3 Asset Roll in			\$0.0
End of Period Adjustments – Inventory			\$2.9
Opening RAB at 1 April 2017 (prior to roll-in of Group 3 assets)			\$3,082.2

An adjustment will be made at the next revenue review for any differences between forecast capital expenditure and the outturn amount for 2016-17. We also note, and accept the AER's intention to use the forecast depreciation approach to establish the RAB at the commencement of the 2022–27 regulatory control period.⁴⁴²

The calculations set out above are consistent with the AER's final amended Transmission Roll Forward Model (Version 3), which was issued in October 2015. The completed model is included as part of this Revised Revenue Proposal.

⁴⁴² AER, *Final Decision – Framework and approach for AusNet Services Regulatory control period commencing 1 April 2017*, April 2015, p. 27.

10.2.2 Historical Inventory Allocations

Following submission of its Revenue Proposal in October 2015, AusNet Services reviewed its historical expenditure allocations for Inventory in both the RAB and Tax Asset Base (TAB) over a period of nine regulatory years from 2008-09 to 2015-16, covering the 2008-14 and 2014-17 regulatory control periods.

AusNet Services found that:

- Inventory capex allocations between depreciating and non-depreciating asset classes within the as-commissioned RAB for the period 2008-09 to 2012-13 were inaccurate and overstated the level of inventory in the depreciating classes of the as-commissioned RAB.
- As a result, AusNet Services received a depreciation (return of capital) allowance over 2008-09 to 2012-13 which it was not entitled to. AusNet Services has calculated this depreciation amount to be \$1.68 million⁴⁴³ (real \$2016/17) as at 1 April 2017.

AusNet Services is therefore returning the \$1.68 million to customers (with compounded interest) in the 2017-22 forecast period through corrections to the RAB using the end of period adjustments in the RFM.⁴⁴⁴ In addition, the remaining undepreciated RAB value of \$1.11 million (nominal) as at 1 April 2017 has been reallocated from RAB category 'other (non-network)' to 'Inventory' (a non-depreciating class).⁴⁴⁵

The tax asset classes in the TAB will also be corrected to reflect the appropriate allocations between 'Inventory' and 'Other'.

Notwithstanding the fact that the AER has previously approved AusNet Services' opening RAB as at 1 April 2014 (of \$2,876.0 million (nominal)⁴⁴⁶), to accurately reflect the correct RAB values which impact depreciation schedules, and therefore allowed revenues, AusNet Services considers it appropriate that adjustments to the RAB be made to enable it to return \$1.68 million to customers.

Further, to maintain consistency between the as-commissioned RAB (the basis of return of capital) and the partially as-incurred RAB (the basis of return on capital), AusNet Services also has adjusted the partially as-incurred RAB to reflect its corrections for Inventory. We note the additions for Inventory were not included in the partially as-incurred RAB.⁴⁴⁷

AusNet Services has made the following amendments in its Revised Proposal RFM using the end of period adjustments inputs:⁴⁴⁸

⁴⁴³ Based on AusNet Services' calculation of the life-to-date depreciation of Inventory related costs within the Non system – Other asset class.

⁴⁴⁴ Per Forecast Final Year (2016-17) Asset Adjustments (\$m Nominal) in the AER's Transmission RFM (Version 3) – RFM input.

⁴⁴⁵ The calculated depreciated RAB value in 'Other (non-network)' as at 1 April 2017 is \$1.11 million (nominal) with a weighted average life remaining of 3.64 years.

⁴⁴⁶ Partially as-incurred RAB as at 1 April 2014, as approved by the AER in the previous control period, per AER Final Decision (2014-17) – SP AusNet roll forward model (RFM) – January 2014.xlsx

⁴⁴⁷ AusNet Services did not receive a return on capital allowance in the 2007-08 to 2012-13 period which it otherwise would be entitled to. The forgone return on capital for Inventory related expenditures (as-incurred) calculated to the end of the current period (2016-17) is \$1.07 million (nominal) as at 1 April 2017. AusNet Services acknowledges that it cannot seek to recoup the forgone return on capital in the current regulatory period (2014-17).

⁴⁴⁸ Per Forecast Final Year (2016-17) Asset Adjustments (\$m Nominal) in the AER's Transmission RFM (Version 3) – RFM input.

Table 10.2: 2016-17 Closing RAB Adjustments (\$m nominal)

Asset Class	RAB As Inc	RAB As Comm	TAB	RAB RL	TAB RL
Inventory	\$2.86	\$2.86	\$2.86	n/a	n/a
Other (non-network)	-	-\$1.11	-\$1.11	n/a	n/a
Inventory Adjustment (Other non-network)	-	-\$1.68	-\$1.68	1.0	1.0

Source: AST Transmission Revised Proposal RFM (2017-22). Asset Adjustment values are expressed in end of year terms.

AusNet Services has established a new asset class ‘*Inventory Adjustment (Other non-network)*’ in its Revised Proposal RFM and PTRM models to cater for the above adjustment. This is a practical means of enabling the -\$1.68 million depreciation adjustment to be made in 2017-18 (the first year of the forecast period). Although the underlying assets have an average remaining life of 3.64 years in the as-commissioned RAB, we consider it appropriate to return the depreciation component to our customers at the earliest opportunity, hence the reason for a 1 year remaining life allocation. AusNet Services has accordingly made some amendments within its straight-line depreciation schedule (‘*AST actual depreciation*’ sheet) in the Revised Revenue Proposal PTRM model to reflect the proposed opening RAB adjustments. In addition, AusNet Services has included other supporting sheets within its proposal RFM which demonstrate how the historical inventory data was reflected in AusNet Services’ historical RAB roll forward on an as-incurred and as-commissioned basis over the 2008-13 period.

Review of 2013-14 to 2015-16 actual expenditures

Following submission of the Revenue Proposal AusNet Services made some amendments to actual capex, both on an as-incurred and as-commissioned basis, for regulatory years 2013-14 and 2014-15 for the purposes of inputs into the Revised Revenue Proposal RFM. These amendments largely take into account the restated historical capex by asset class information contained in AusNet Services’ recently submitted 2015-16 Transmission regulatory accounts. The restated historical capex (by asset class) information includes prior regulatory years 2013-14 and 2014-15.

Revenue Proposal

In the Revenue Proposal AusNet Services populated its RFM using a combination of source actual expenditures from the historical annual regulatory accounts and forecast expenditures from its Capex model.⁴⁴⁹ The gross expenditures with respect to *Inventory* and *Other (non-network)* included in the Revenue Proposal are shown in the Table below.

⁴⁴⁹ AST Transmission 2017-22 TRR Capex Model.xlsx

Table 10.3: Revenue Proposal Gross Capex – RFM inputs (\$m nominal)

Capex Class	Asset Class	2013-14 (Actual)	2014-15 (Actual)	2015-16 (F'cast)	2016-17 (F'cast)
As Incurred	Inventory	-	-	-	-
	Other (non-network)	\$2.72	\$2.16	\$2.02	\$2.60
As Commissioned	Inventory	\$0.82	\$10.56	-	-
	Other (non-network)	\$4.75	\$3.19	\$2.02	\$2.60

Source: AST Transmission Initial Proposal RFM (2017-22). Values exclude the half year rate of return.

AusNet Services sourced this information from the historical regulatory accounts supporting capex schedules ('additions' basis). Within these capex schedules Inventory capex was allocated into the 'Non-system – Other' class (a depreciating asset class with a 10 year asset life) rather than 'inventory' (a non-depreciating asset class), which led to inaccuracies in the 2009-13 period (as discussed previously). In its Revenue Proposal AusNet Services sought to correct this by including as-commissioned Inventory capex under the 'Inventory' asset class in the RFM.

The AER queried this correction,⁴⁵⁰ and AusNet Services responded⁴⁵¹ that there were potential allocation issues with respect to Inventory in its historical regulatory accounts and that any revisions would be formally advised to the AER as part of the 2015-16 Regulatory Accounts and reflected in AusNet Services' Revised Revenue Proposal.

Subsequently AusNet Services was able to determine that the Inventory capex of \$0.82 million (nominal) for 2013-14 was a true reflection of Inventory related expenditure and supported by movements in AusNet Services non-current inventory account balance (March to March).

With respect to the Inventory capex of \$10.56 million (nominal) for 2014-15, AusNet Services confirms that this included a one-off true-up amount of \$8.73 million (nominal) together with an annual account balance movement of \$1.84 million (nominal).

The \$8.73 million (nominal) true-up was included to align the closing March 2015 statutory account balance in AusNet Services' non-current inventory with the corresponding closing RAB value (as-commissioned). However, the more appropriate mechanism to address inaccuracies in historical allocation is through corrections to the RAB in this regulatory reset rather than via a one-off true-up in the 2014-15 regulatory accounts.

AusNet Services has therefore made amendments to its Inventory capex in this Revised Revenue Proposal for 2013-14 and 2014-15 as discussed in the following section. AusNet Services has also restated its historical capex by asset class (including 2013-14 and 2014-15) in its submitted 2015-16 transmission regulatory accounts to correct for the one-off true up in 2014-15.

Draft Decision

In the Draft Decision the AER reallocated as-commissioned 'Inventory' capex (as proposed in Table 10.3 above) into Other (non-network) pending further clarification from AusNet Services.

The AER's capex allocations as contained in the Draft Decision RFM are shown in the Table below.

⁴⁵⁰ As part of an information request (IR#017 – As-commissioned capex allocations) in May 2016.

⁴⁵¹ Per Response to AER information request (IR#017) on 3rd June 2016.

Table 10.4: AER Draft Decision Gross Capex – RFM inputs (\$m nominal)

Capex Class	Asset Class	2013-14 (Actual)	2014-15 (Actual)	2015-16 (F'cast)	2016-17 (F'cast)
As Incurred	Inventory	-	-	-	-
	Other (non-network)	\$2.72	\$2.16	\$2.02	\$2.58
As Commissioned	Inventory	-	-	-	-
	Other (non-network)	\$5.58	\$13.75	\$2.02	\$2.58

Source: AER Draft Decision AST Transmission RFM (2017-22). Values exclude the half year rate of return.

The AER's allocation of Inventory capex in its Draft Decision is consistent with the way AusNet Services has historically allocated Inventory capex in the RAB since 2008-09.

Response to Draft Decision

Since the AER made its Draft Decision in July 2016 AusNet Services has submitted its 2015-16 regulatory accounts which include restated historical capex by asset class information.

The historical restatements incorporate prior regulatory years 2013-14 and 2014-15. A copy of the submitted capex template within the regulatory accounts is included in AusNet Services' Revised Proposal RFM (refer to 'Historical Capex by Asset Class' sheet).

The historical 'Inventory' and 'Non-system – other' capex are restated for 2013-14 and 2014-15 on an as-commissioned basis which is consistent with previous practice in the 2008-14 period where AusNet Services included its inventory capex on an as-commissioned basis.

AusNet Services has used this latest audited information to populate the RFM. We have also made adjustments to establish corresponding values in the partially As-incurred RAB for 'Inventory' in regulatory years 2013-14 and 2014-15 to reflect the corrected data. A correction for movements in capitalised provisions affecting all asset classes was also made as explained in section 10.2.3 below. All of the proposed adjustments are contained in the 'Provisions & Adjustments' sheets (additional sheets added by AusNet Services) in its Revised Revenue Proposal RFM feeding into RFM inputs.⁴⁵²

The Table below sets out AusNet Services' Revised Revenue Proposal Capex for 'Inventory' and 'Other (non-network)'.

Table 10.5: Revised Proposal Gross Capex – RFM inputs (\$m nominal)

Capex Class	Asset Class	2013-14 (Actual)	2014-15 (Actual)	2015-16 (Actual)	2016-17 (F'cast)
As Incurred	Inventory	\$0.82	\$1.84	-\$0.29	-\$0.19
	Other (non-network)	\$2.72	\$2.17	\$1.56	\$2.58
As Commissioned	Inventory	\$0.82	\$1.84	-\$0.29	-\$0.19
	Other (non-network)	\$4.75	\$3.19	\$0.94	\$2.58

Source: AST Transmission Revised Proposal RFM (2017-22). Values exclude the half year rate of return.

⁴⁵² Separate sheets are provided for As-Incurred and As-Commissioned capex.

In its Revised Proposal RFM AusNet Services has updated its 2015-16 forecasts for actual expenditures as set out in the 2015-16 transmission regulatory accounts.

10.2.3 Adjustments for movements in provisions

The AER's approach to adding capex to the RAB (before adjusting for asset disposals) is to adjust for movements in capitalised provisions. AusNet Services provides information on its accounting provisions for prescribed Transmission services in both its annual regulatory accounts and economic benchmarking RIN templates.

Revenue Proposal

In populating its Revenue Proposal RFM AusNet Services sourced its actual gross capex values for 2013-14 and 2014-15 by asset class from the historical transmission regulatory accounts. The source actual capex values were adjusted for movements in capitalised provisions, consistent with the AER's requirements for additions into the RAB.

The Table below shows the total nominal capex in each year adjusted for provision movements, reconciling to AusNet Services' Initial Proposal inputs.

Table 10.6: Revenue Proposal Total Gross Capex – RFM inputs (\$m nominal)

Capex Class	Asset Class	2013-14 (Actual)	2014-15 (Actual)	2015-16 (F'cast)
As Incurred	Total Capex before provision adjustments	\$144.102	\$151.546	\$145.057
	<i>Provision increase / (decrease)</i>	-\$0.222	\$0.328	-
	Total Capex after provision adjustments	\$144.324	\$151.219	\$145.057
As Commissioned	Total Capex before provision adjustments	\$167.317	\$186.041	\$182.881
	<i>Provision increase / (decrease)</i>	-\$0.222	\$0.328	-
	Total Capex after provision adjustments	\$168.140	\$185.714	\$182.881

Source: AusNet Services' Historical Regulatory Accounts supporting capex schedules ('Spend' basis and 'Additions' basis), AST Transmission Initial Proposal RFM (2017-22). Values exclude the half year rate of return.

The capex forecasts for 2015-16 were sourced from AusNet Services' Revenue Proposal Capex model.

Draft Decision

In its Draft Decision on AusNet Services' opening RAB the AER states that the proposed gross capex for 2013-14 and 2014-15 in the RFM included capitalised provisions.⁴⁵³ During this revenue reset process AusNet Services confirmed the provision movements by asset class for 2013-14 and 2014-15,⁴⁵⁴ including a correction to 2014-15 provision movements which were found to be misstated in the 2014-15 regulatory accounts.⁴⁵⁵

⁴⁵³ AER, *AusNet Services Draft Decision*, July 2016: Attachment 2 – Regulatory Asset base, p. 21.

⁴⁵⁴ Response to AER Information Request IR#004, 18 December 2015.

⁴⁵⁵ AusNet Services observes that the AER has sourced the correct provision movement for 2014-15 from AST Transmission's 2014-15 economic benchmarking RIN which is consistent with information provided to the AER by asset class in response to IR#004 on 18 December 2015.

In its response to the AER's information request AusNet Services did not explicitly point out that the Revenue Proposal gross capex values had already been adjusted for provisions. It is perhaps for this reason that the AER then adjusted the proposal capex inputs in the Draft Decision RFM as well, effectively adjusting for provisions twice.

The Table below shows the total nominal capex in each year adjusted for provision movements, reconciling to the AER's Draft Decision RFM inputs.

Table 10.7: AER Draft Decision Total Gross Capex – RFM inputs (\$m nominal)

Capex Class	Asset Class	2013-14 (Actual)	2014-15 (Actual)	2015-16 (F'cast)
As Incurred	Total Capex per AST initial proposal	\$144.324	\$151.219	\$145.057
	<i>Provision increase / (decrease)</i>	-\$0.222	\$0.226	-
	Total Capex after provision adjustments	\$144.547	\$150.993	\$145.057
As Commissioned	Total Capex per AST initial proposal	\$168.140	\$185.714	\$182.881
	<i>Provision increase / (decrease)</i>	-\$0.222	\$0.226	-
	Total Capex after provision adjustments	\$168.362	\$185.488	\$182.881

Source: AER Draft Decision AST Transmission RFM (2017-22). Values exclude the half year rate of return.

Response to Draft Decision

As previously noted, AusNet Services has made amendments to the historical capex allocations for 'Inventory' and 'Other (non-network)' asset classes. In addition, AusNet Services has made a further adjustment to correct provision movements which were found to be misstated in the 2014-15 regulatory accounts.

The Table below sets out AusNet Services' Revised Revenue Proposal gross capex (adjusted for provisions), reconciled to the Revised Revenue Proposal inputs.

Table 10.8: Revised Proposal Total Gross Capex – RFM inputs (\$m nominal)

Capex Class	Asset Class	2013-14 (Actual)	2014-15 (Actual)	2015-16 (Actual)
As Incurred	Total Capex before provision adjustments	\$144.925	\$153.384	\$142.495
	<i>Provision increase / (decrease)</i>	-\$0.222	\$0.226	\$2.078
	Total Capex after provision adjustments	\$145.147	\$153.158	\$140.418
As Commissioned	Total Capex before provision adjustments	\$167.917	\$177.315	\$130.376
	<i>Provision increase / (decrease)</i>	-\$0.222	\$0.226	\$2.078
	Total Capex after provision adjustments	\$168.140	\$177.089	\$128.298

Source: AST Transmission Revised Proposal RFM (2017-22). Values exclude the half year rate of return.

The above reflects the AER's approach in adjusting for movements in provisions, only applies it once, and uses corrected data.

10.3 Forecast of regulatory asset base over the forthcoming regulatory control period

The Table below presents a summary of the amounts, values and inputs used by AusNet Services to derive its forecast RAB value for each year of the forthcoming regulatory period. In accordance with NER S6A.2.1(f)(4), only actual and estimated capital expenditure properly allocated to the provision of prescribed transmission services in accordance with AusNet Services' approved Cost Allocation Methodology has been included in the RAB.

In accordance with the approach explained in section 10.2 above, Group 3 assets are rolled into the RAB at their actual depreciated values to derive an adjusted opening RAB as at 1 April 2017, consistent with the AER's Draft Decision.

Table 10.9: Regulatory asset base roll forward (As Incurred) 1 April 2017 to 31 March 2022 (\$m nominal)

Regulatory Year	2017/18	2018/19	2019/20	2020/21	2021/22
Opening RAB	\$3,082.2	\$3,249.4	\$3,297.7	\$3,333.7	\$3,350.1
Group 3 Assets roll in	\$99.0	-	-	-	-
Adjusted Opening RAB	\$3,181.2	\$3,249.4	\$3,297.7	\$3,333.7	\$3,350.1
Net Capital expenditure	\$188.9	\$171.2	\$166.3	\$149.9	\$129.3
Opening RAB inflation addition	\$52.5	\$53.6	\$54.4	\$55.0	\$55.3
Nominal Straight-line depreciation	-\$173.2	-\$176.6	-\$184.7	-\$188.5	-\$172.0
Closing RAB	\$3,249.4	\$3,297.7	\$3,333.7	\$3,350.1	\$3,362.7

Source: AusNet Services' Revised Proposal PTRM.

11 Pricing Methodology and Negotiating Framework

This chapter sets out AusNet Services' response to the Australian Energy Regulator's (AER's) Draft Decision with respect to the Pricing Methodology and Negotiating Framework as set out in Attachments 12 and 14 of the Draft Decision. AusNet Services' proposed Pricing Methodology and Negotiating Framework were provided in Attachments 14A and 15A of the Revenue Proposal.

In the event of inconsistency between information contained in this chapter and AusNet Services' Revenue Proposal, the information contained in this chapter prevails.

11.1 Introduction

The National Electricity Rules (NER) requires a Transmission Network Service Provider (TNSP) to submit a proposed pricing methodology relating to the prescribed transmission services that are provided by means of, or in connection with, a transmission system that is owned, controlled or operated by that TNSP.

The proposed pricing methodology must satisfy principles and guidelines established under the NER. Specifically, NER 6A.10.1(e) requires the proposed pricing methodology to:

- (1) give effect to and be consistent with the Pricing Principles for Prescribed Transmission Services (that is to say, the principles set out in NER 6A.23); and
- (2) comply with the requirements of, and contain or be accompanied by such information as is required by, the pricing methodology guidelines made for that purpose under NER 6A.25.

NER 6A.24.1(b) describes the purpose of the pricing methodology. It states that the pricing methodology is a methodology, formula, process or approach that, when applied by a TNSP:

- (1) allocates the Aggregate Annual Revenue Requirement (AARR) for prescribed transmission services provided by that provider to:
 - (i) the categories of prescribed transmission services for that provider; and
 - (ii) transmission network connection points of Transmission Network Users; and
- (2) determines the structure of the prices that a TNSP may charge for each of the categories of prescribed transmission services for that provider.

The NER also requires certain transmission services (negotiated transmission services) to be provided on terms and conditions of access that are negotiated between the TNSP and the service applicant. Each TNSP is required to prepare a negotiating framework, which sets out the procedure to be followed during negotiations.

The negotiating framework must comply with the minimum requirements specified in NER 6A.9.5(c), including matters such as:

- Negotiating in good faith;
- Provision of commercial information to facilitate effective negotiation;
- Provision of information relating to the costs of service provision;
- Timeframes for commencing, progressing and finalising negotiations;
- A process for dispute resolution;
- Cost recovery arrangements for processing applications; and

- A requirement to notify and consult with any affected transmission users, and to ensure that obligations to those users continue to be met.

The NER also requires AusNet Services to conduct negotiations in accordance with the Negotiated Transmission Service Criteria, which will be specified in the AER's final determination. In turn, these criteria must give effect to and be consistent with the principles set out in NER 6A.9.1. In broad terms, these principles establish the acceptable upper and lower bounds for negotiated terms and conditions.

Consistent with the above requirements, AusNet Services submitted a proposed Pricing Methodology and Negotiating Framework which addressed all of the matters required in the NER.

11.2 Draft Decision

The AER accepted AusNet Services' proposed Pricing Methodology and Negotiating Frameworks.

11.3 Revised Revenue Proposal

AusNet Services accepts the Draft Decision on the Negotiating Framework and Pricing Methodology.

List of Appendices

Reference	Title
Appendix 1A	Accelerated Depreciation: Background Briefing Document
Appendix 1B	Engagement Overview – TRR Accelerated Depreciation
Appendix 1C	Revised Revenue Proposal 16 August Stakeholder Forum Summary
Appendix 3A	GHD, Risk Engineering Expert Advice – Safety Risk Quantification Report
Appendix 3B	Statement from the Board of AusNet Services
Appendix 3C	AER's HZO Rate Model
Appendix 3D	Assessment of alternative project options
Appendix 3E	Terminal Station Hazard Zones
Appendix 3F	Farrier Swier Consulting, Independent Advice on Capex Economic Analysis Approach
Appendix 3G	East Rowville Terminal Station Planning report
Appendix 3H	Selected ICT Project Justifications
Appendix 4A	CIE Labour Forecasts.
Appendix 4B	Analysis of Ukrainian cyber-attacks.
Appendix 4C	SAIP NPV analysis.
Appendix 4D	AEMO letter to AusNet Services re retirement of SCOs.
Appendix 5A	The Diminishing Value Approach.
Appendix 5B	Yallourn Power Station asset values.
Appendix 5C	Macquarie Securities research note
Appendix 6A	CEG, Replication and Extension of Henry's beta analysis, September 2016
Appendix 6B	Frontier Economics, The market risk premium, September 2016
Appendix 6C	CEG, The AER's Current Interpretation of the ARORO, September 2016
Appendix 6D	CEG, Criteria for Assessing Fair Value Curves: An Update, September 2016
Appendix 6E	CEG, Review of AER Position on Curve Selection;
Appendix 6F	CEG: Best estimate of expected inflation: revaluations and revenue indexation, September 2016.
Appendix 7A	Frontier Economics, An updated dividend drop-off estimate of theta, September 2016.
Appendix 7B	Frontier Economics, Issues in the estimation of gamma, September 2016.

Reference	Title
Appendix 8A	Fitting probability distributions to Service Component data.