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# **AusNet Transmission Group Pty Ltd**

**Transmission Revenue Review 2017-2022**

**Revised Revenue Proposal**

**Appendix 3F: Independent Advice on  
Capex Economic Analysis Approach**

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## **AusNet Services - Transmission Revenue Review 2017-22**

### **Independent advice on capex economic evaluation approach**

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# I. Introduction

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I have been engaged by AusNet Services to prepare an independent report on two questions about the Australian Energy Regulator's (AER) approach in its draft decision to adjusting forecast replacement capital expenditure.

## I.1 Background

AusNet Services is currently developing its revised revenue proposal for the period 2017 – 2022. AusNet Service's revenue proposal proposed an economic evaluation method for forecasting project-based replacement capex. The AER's draft decision found that this method - which adopts a risk-based economic planning approach - reflects "good industry practice"<sup>1</sup>. The AER identified specific areas of concern about some of the input assumptions used in AusNet Services' forecasting methodology.

This report is concerned with AER's assessment of AusNet Services' economic evaluation methodology for quantifying safety risk<sup>2</sup>. The AER's draft decision changed the equation for quantifying safety risk and amended one of the parameter levels to this equation. The AER introduced a new parameter – the *hazard zone occupancy rate*<sup>3</sup> – and set this at 1 percent, compared to a rate of 100 percent the AER said had been implicitly assumed by AusNet Services.

The AER then quantified the significance of the impact of the changed approach to estimating safety risk. It did this by examining a sample of AusNet Services' asset replacement programs and major station projects. The AER reviewed a sample of six projects accounting for approximately 83 percent of CBD station rebuilds and major station replacement projects. For each project the AER adjusted AusNet Services' economic model by including an assumed 1 per cent hazard zone occupation rate in the safety risk calculation input. The AER then "assessed whether the revised economic modelling continued to support the full project as proposed by AusNet Services, or whether the reduced safety risk cost justified a reduced scope of work" (and forecast capital expenditure). The AER made this assessment by converting the revised estimate of expected benefits into an equivalent capital value assuming the same project timing

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<sup>1</sup> Pg. 6-22 Attachment 6 – Capital expenditure, AER Draft decision: AusNet Services transmission determination 2017–22

<sup>2</sup> As part of AusNet Services' economic analysis to support asset replacement and maintenance decisions, it undertakes an assessment of asset condition and reliability modelling to determine the probability of asset failure, and an assessment of the consequences in terms of safety costs. This is as an input to determining the expected cost of asset failure.

<sup>3</sup> The AER defines the hazard zone occupancy rate as being a realistic estimate of the likelihood that a person will be in the vicinity of a transmission network asset when it fails.

as proposed by AusNet Services. This is called the *AER adjustment approach* in this report.

The AER adjustment approach reduced the forecast replacement capital expenditure by \$74.9 million for four of the six projects, from \$236.5 million to \$161.6 million<sup>4</sup>. This reduction is equivalent to 31.7% of the total major stations capital expenditure proposed by AusNet Services in its TRR proposal.

## 1.2 Questions

AusNet Services has requested a report that sets out an independent assessment of:

- the reasonableness of the *AER adjustment approach*
- whether the *AER adjustment approach* could be interpreted as a pre-determination that future capex undertaken on major replacement projects in excess of the amounts determined by the AER following the safety adjustment is inefficient, and how this approach interacts with the AER's ability to apply an ex-post prudence adjustment to capex.

## 1.3 Qualifications

This report has been prepared by Geoff Swier, Director, Farrier Swier Consulting. I have a Masters of Commerce degree in Economics. I have over 20 years' experience in the application of economic regulation to network businesses, having acted as a policy maker, adviser, regulator and consultant to regulators and network businesses across the electricity, gas and other infrastructure sectors in Australia and New Zealand. I have prepared a number of expert economic reports and have been a member of dispute resolution panels.

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<sup>4</sup> This reduction does not include adjustments to the capital expenditure forecast made by the AER to reflect lower demand forecasts.

## 2. The reasonableness of the AER approach

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This section sets out my assessment of the reasonableness of the *AER adjustment approach*.

### 2.1 Findings

The AER made a material adjustment to AusNet Services' replacement capital expenditure forecast. In my opinion this means care is required in selecting the adjustment approach in order to be confident that the AER's adjusted replacement capital expenditure forecast complies with the NER capex criteria.

The AER did not explain in its draft decision the reasoning for the adjustment approach it chose, nor did it consider other approaches it might have adopted.

By not adopting the same analysis approach used by AusNet Services to derive the original capital expenditure program, the AER is likely to have both underestimated and overestimated different components of the downward adjustment for the forecast project-based replacement capex over the regulatory period.

A method that is more likely to produce a more accurate replacement capital expenditure forecast that meets the NER capex criteria would be the method originally used by AusNet Services.

Supporting background and analysis is set out below.

### 2.2 Background

The National Electricity Rules (NER) set out specific requirements to ensure the AER assesses and determines expenditure proposals in accordance with the National Electricity Law (NEL) and hence give effect to the National Electricity Objective (NEO). The *Expenditure Forecast Assessment Guideline for Electricity Transmission*<sup>5</sup> sets out how the AER assesses and determines a TNSP's replacement capex.

When the AER makes a transmission determination, it must decide whether or not it is satisfied that a TNSP's proposed total capex forecast reasonably reflect the capex criteria. These criteria are:

- the efficient costs of achieving the capex objectives
- the costs that a prudent operator would require to achieve the capex objectives

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<sup>5</sup> AER, Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Transmission, November 2013

- a realistic expectation of the demand forecast and cost inputs required to achieve the capex and opex objectives

If satisfied, the AER must accept the TNSP's forecast. If the AER is not satisfied, it must not accept the forecast and estimate a total forecast that it is satisfied reasonably reflects the capital expenditure criteria.

The AER must provide reasons for its decisions.

The next section sets out my assessment of

- Whether the *AER adjustment approach* to adjusting the project based replacement capex forecast reasonably reflects the capital expenditure criteria; and
- Whether the AER has adequately provided reasons for its decisions (which goes to the reasonableness of its draft decision).

## 2.3 Analysis

### 2.3.1 The AER adjustment is material

The likely materiality of the adjustment amount is a relevant factor in assessing reasonableness of the *AER adjustment approach*. If the amount by which the AER adjusted the forecast was not material, then it may be reasonable for the ARR to adopt a simplified *adjustment approach*.

The adjustment amount determined by the AER is material being 31.7% of the total major stations replacement projects capital expenditure proposed by AusNet Services in its revenue proposal. In my opinion the material amount of the adjustment in the context of the total revenue determination means that care needs to be taken in selecting the adjustment approach in order to be confident that the AER-adjusted forecast:

- meets the capex expenditure criteria and objectives including that the forecast represents the efficient costs of achieving the capex objectives;
- reflects the costs that a prudent operator would require to achieve the capex objectives; and
- reflects a realistic expectation of the demand forecast and cost inputs required to achieve the capex and objectives.

### 2.3.2 The adequacy of AER reasoning

While the AER explained in detail in its draft decision its assessment of AusNet Services' method for assessing safety risk, in my opinion it did not adequately explain its reasoning for how it adjusted the project-based replacement cost expenditure based on the changed safety cost equation and parameter values.



The relevant part of the AER decision is set out below with the key part of AER reasoning underlined:

*For each project, we adjusted AusNet Services' economic model to account for the overestimation of safety risk by including an assumed 1 per cent hazard zone occupation rate in the safety risk calculation input. This provided a revised estimate of the expected benefits (avoided asset failure risks) for each project. We then assessed whether the revised economic modelling continued to support the full project as proposed by AusNet Services, or whether the reduced safety risk cost justified a reduced scope of work in the 2017–22 regulatory control period. We did this by converting the revised estimate of expected benefits into an equivalent capital value project, assuming the same project timing as proposed by AusNet Services.*

In the above passage the AER did not explain why it decided to convert the revised estimate of expected benefits into an equivalent capital value project, or explain why it assumed the same project timing as proposed by AusNet Services, when, under a strict application of AusNet Services' approach, the project timing would be deferred. The AER did not set out other approaches it might have adopted, and in particular did not explain why it did not consider applying the methodology proposed by AusNet Services in its revenue proposal (when the AER had found that this method reflected good industry practice).

The next section sets out factors that would need to have been considered had AusNet Services' approach been applied and the implications of not using this method for accuracy of the replacement capital expenditure forecast.

### 2.3.3 Factors considered under AusNet Services' approach

Each analysis stage applied by AusNet Services is set out below, together with an assessment of the potential impacts of not undertaking this analysis on the calculation of the downward adjustment amount.

#### 1. Changes in the estimated costs of the technical options originally assessed by AusNet Services

AusNet Services uses a bottom-up approach to estimate the costs of technical options required to address the cost of failure for each individual asset<sup>6</sup>.

The estimated costs of the technical options may potentially be different under the AER's revised approach to assessing safety costs. However, instead the AER ignored any changes to the technical option or the option costs.

Under the AER's safety approach the estimated technical costs may differ because:

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<sup>6</sup> Section 6.1.2, Appendix 4A: Network Capital Expenditure Overview – 2017 to 2022, Transmission Revenue Reset 2017–2022, AusNet Electricity Services Pty Ltd.

- Safety precautions would need to be implemented – such as barricading assets with highest explosive failure risk and restricting site access
- The most at-risk equipment may need to be de-energised to enable safe site access during the project;
- A greenfield replacement project may need to be undertaken.

Reduced economies of scope and scale across the capex portfolio could also increase project costs.<sup>7</sup> These factors may increase the duration and technical complexity of the proposed projects.

If the estimated average costs of the efficient technical options have increased, then the AER may have:

- provided expenditure allowances that are not reflective of a feasible major station projects that could be constructed by AusNet Services in practice; and
- overstated the downward adjustment for the forecast project-based replacement capex over the regulatory period.

## **2. Changes in timing of the economic timing of selected options**

AusNet Services used economic cost-benefit analysis to determine the economic timing of the selected options. The economic timing is identified as the point in time when the annualised benefits of a project just exceed the incremental costs, including safety costs<sup>8</sup>.

Given the AER reduced the valuation of safety costs, proper application of the AusNet Services method would result in deferred timing of the commencement of the four major station projects (because it would take a longer period of time for declining asset condition to give rise to safety costs that would exceed incremental costs and trigger the need for the project to proceed).

However as noted, the AER assumed the same project timing as determined by AusNet Services in its proposal. The AER does not explain why it adopted the same project timing, when application of the AusNet Services methodology would result in deferral of the project timings.

This aspect may mean that the AER has understated the downward adjustment for the forecast project-based replacement capex over the regulatory period.

## **3. Changes in S curves**

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<sup>7</sup> Advice from AusNet Services.

<sup>8</sup> Section 6.1.2, Appendix 4A: Network Capital Expenditure Overview – 2017 to 2022, Transmission Revenue Reset 2017–2022, AusNet Electricity Services Pty Ltd.

AusNet Services calculated S curves to determine major project expenditure profiles.<sup>9</sup>

Proper application of AusNet Services' methodology would likely result in changes to the calculation of capital expenditure profiles as a result of different technical options being found to be optimal. It is not clear whether by ignoring this step the AER might have overstated or understated the downward adjustment for the forecast project-based replacement capex over the regulatory period.

#### **4. Savings in relation to AEMO augmentation planning and distribution businesses connection planning**

AusNet Services considered savings arising from coordination with AEMO's augmentation planning and distribution connection planning.<sup>10</sup>

These savings may change as a result of the changed capital expenditure program. The quantum of these savings might well be reduced, as a result of a smaller capital expenditure program being undertaken during the regulatory period.

The AER however implicitly assuming these savings would be unchanged. The implication is that the AER has overstated the downward adjustment for the forecast project-based replacement capex over the regulatory period.

### **Conclusion**

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.

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<sup>9</sup> Section 6.1.4, Appendix 4A: Network Capital Expenditure Overview – 2017 to 2022, Transmission Revenue Reset 2017–2022 AusNet Electricity Services Pty Ltd

<sup>10</sup> Section 6.1.3, Appendix 4A: Network Capital Expenditure Overview – 2017 to 2022, Transmission Revenue Reset 2017–2022 AusNet Electricity Services Pty Ltd.

### 3. Ex post review and the risk of costs being deemed inefficient

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The section considers the question of whether the *AER adjustment approach* could be interpreted as a pre-determination that future capex undertaken on major replacement projects in excess of the amounts determined by the AER following the safety adjustment is inefficient, and how this approach interacts with the AER's ability to apply an ex-post prudency adjustment to capex.

#### 3.1 The question

The ex post review provisions in the NER are complex and so whether the AER might determine that future capex undertaken on major replacement projects in excess of the amounts determined by the AER following the safety adjustment is inefficient will depend on a variety of circumstances and factors.

It is useful to rephrase the question to clarify the nature of AusNet Services' potential risk. The rephrased question is as follows:

*If the AER maintains the same (or similar approach) to safety cost risk in its final decision;*

*and*

*if AusNet Services decides to proceed to deliver the major station projects to meet its interpretation of the relevant safety obligations;*

- which are based on achieving higher levels of safety than assumed by the AER;*
- and*
- incur higher costs than have been determined by the AER;*

*could AusNet Services be exposed to a risk that the AER will deem certain project costs to be overspending in an ex post review and exclude part of the full project costs from the Regulated Asset Base (RAB)?*

My finding is in section 3.2 below and supporting background and analysis is set out in section 3.3.

#### 3.2 Finding

There is a significant risk to AusNet Services that the AER will:

1. undertake ex post reviews of the major station projects if they proceed in line with the cost estimates and timing proposed by Ausnet Services; and
- find that a significant portion of the project capital expenditure costs are inefficient in an ex post review and not allow the full costs to be rolled into the Regulated Asset Base (RAB).

## 3.3 Background

The regulatory regime promotes a network service provider (NSP) to undertake capital expenditure efficiently through two main mechanisms:

- **Ex-ante incentive regulation** - determination by the AER of ex ante expenditure allowances by the AER and relying on the incentives for efficiency (including the Capital Expenditure Efficiency Scheme) to encourage the NSP to efficiently meet its obligations;
- **Ex post review** - allowing the AER to deem certain capital expenditure to be inefficient and prevent it being included in the RAB.

The ex post review provisions are set out in

- S6A.2.2 of the National Electricity Rules (NER) and
- in section 4 of the AER's *Capital Expenditure Incentive Guideline*

The relevant aspects of the ex post review process and the implications for the risks to AusNet are as follows:

### 3.3.1 Overspending

One of the circumstances<sup>11</sup> in which the AER may reduce the RAB for inefficient past capex is where the NSP has spent more than its allowance in the regulatory period (overspending<sup>12</sup>).

The AER Capital Expenditure Incentive Guideline states that the first stage in deciding whether it will to exclude capex overspends will be to consider the following factors<sup>13</sup>:

- Has the NSP spent more than its allowance?
- Is the overspend significant?
- What is NSP's history of capex?
- How does the NSP compare with similar NSPs?

If a review of these questions indicates concerns with the NSP's capex, then the AER would proceed to a second stage being a detailed assessment of capex and project management planning processes.

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<sup>11</sup> s2.2A(c) defines what constitutes an overspend, including having regard for re-opening provisions, pass throughs and contingent projects.

<sup>12</sup> Other circumstances include inflated related party margins and where a change to an NSPs capitalisation policy has led to opex being capitalised - these are not relevant here.

<sup>13</sup> Figure 1, Pg. 14 AER Capital Expenditure Incentive Guideline

**Implication for risk of ex post review**

The risk of an ex post review depends in part on whether additional capital expenditure by AusNet Services on the major station projects (in excess of that allowed for by the AER in setting capital expenditure allowances) results in overspending of the overall expenditure allowance. That is, for the ex post risk to arise, the additional expenditure on the major station projects would not be fully offset by reductions elsewhere in the capital expenditure program.

**3.3.2 The ex post statement and timing of AER determination of exclusion of capex from the RAB**

At the end of a regulatory control period the AER will, as part of a regulatory determination, make an ex post statement<sup>14</sup> drawing on the ex post review process outlined above. This will coincide with the roll forward of the RAB undertaken as part of a regulatory determination. The period for the ex post statement is the regulatory control period. This differs from the “ex post exclusion period” which covers years 1, 2 and 3 of the regulatory control period just ending and years 4 and 5 of the preceding regulatory control period.

The ex post statement arrangements mean that any overspending in the forthcoming regulatory period (2017-2022) will be:

- reviewed at two points in time (as shown in the following table); and
- considered in total with overspending in other regulatory periods.

Regulatory determination	Over or under spending occurring in:	Ex post statement	Ex post review
Transmission Revenue Review 2013-2016 (Previous review)	2015/16	No ex post statement prepared	Ex post review made in 2021/22 drawing on ex post statement prepared for 2017-2022 period
	2016/17		
Transmission Revenue Review 2017-2022 (Current review)	2017/18	Ex post statement prepared in 2021/22 for 2017-2022 period	Ex post review made in 2027-28 drawing on ex post statements prepared for the determinations in 2021/22 and 2027/28
	2018/19		
	2019/20		
	2020/21		
	2021/22		
Transmission Revenue Review 2023-2028 (Next review)	2022/23	Ex post statement prepared in 2027-28 for 2023-2028 period	
	2023/24		
	2024/25		

<sup>14</sup> s14.2(b) requires AER to prepare an ex post statement in Draft and Final Decisions about whether roll forward of RAB will contribute to achieving capex incentive objective.

### *Implication for risk of ex post review*

These timing arrangements and the way in which overspending is defined mean there may be opportunities for AusNet Services to shift the timing of expenditure on the major station projects between years. This may enable mitigation of some of the risk of overspending on individual projects being excluded from the RAB. For example, if there has been underspending in 2015/16 and 2016/17, then it may be beneficial for AusNet Services to bring forward spending on the major station projects from 2021/21 and 2021/22.

These timing arrangements in the table above highlight that the ex post review risks do not crystallise for several years in the future. In particular, any overspending in the period 2020/21 to 2021/22 will not be subject to review by the AER until 2027-28. Given the likely development of AER review techniques over that time it is difficult for AusNet Services to predict how the AER would undertake any review of safety cost risks.

### **3.3.3 AER Ex Post Review approach**

The AER states that it will use the same ex post review process for the ex post statement and the ex post exclusion assessment, but it is likely that the process will be more detailed for the years in which the ex post exclusion provisions apply.<sup>15</sup>

## **3.4 Analysis**

The quantum of risk of ex post review of excess expenditure undertaken by AusNet Services for the major station projects in the forthcoming regulatory period depends in part on whether there are:

- off-setting underspends elsewhere in the total capital expenditure programs in each year within the relevant ex post exclusion period;
- off-setting underspends in other years in the relevant ex post exclusion period; and
- opportunities to shift the timing of expenditure on the major projects between years in response to then way overspending is defined and reviewed.

While there may be some ability for AusNet Services to mitigate the quantum of ex post risk, given the significant differences between its and the AER's capital expenditure forecasts of major station projects, it is reasonable to expect that AusNet Services will be exposed to significant risk of ex post exclusion.

In particular, I consider that if AusNet proceeds with any of the major projects in line with the forecast timing and costs in its revenue proposal then there is a high likelihood that the AER will undertake an ex post review to determine whether the increased costs

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<sup>15</sup> Pg. 14 AER Capital Expenditure Incentive Guideline

(relative to the AER's forecasts) are efficient. This is because of the materiality of the amounts involved, and the potential for the AER (as it sees it) to promote the long-term interests of consumers by limiting the inclusion in the RAB of capital expenditure deemed to be inefficient.

If the AER does proceed with an ex post review of the capital expenditure incurred for any of the major projects, then I consider that it will take into account the differences in assumptions on the appropriate levels of safety outcomes as between itself and AusNet Services. However, as stated by the AER (see section 3.3.3 above) an ex post review is likely to be conducted in greater detail than the ex-ante capital expenditure reviews, and will likely therefore take account of more granular information about the project including review of the efficiency of the actual costs incurred and the specific relevant safety factors. The ex post assessment of safety-related cost drivers and their relationship with the determination of the efficient costs for each project could therefore be different from the higher level assessment undertaken by the AER in its final decision.

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. AusNet Services may be able to mitigate the regulatory risks to some extent for example through developing more robust evidence on safety analysis that it can submit to the AER in an ex post review. But given the AER's reasoning set out in the draft decision I consider that AusNet Services could place little reliance on such mitigations as part of its business decision making processes.

## **Conclusion**

I conclude therefore that if AusNet Services proceeds to deliver the major station projects (including to meet its interpretation of the relevant safety obligations and noting that these are based on achieving higher levels of safety than assumed by the AER) then it faces a significant risk that:

1. the AER will undertake ex post reviews of the major projects; and
2. will find that a significant portion of the project capital expenditure costs to be inefficient in an ex post review and not allow the full costs to be rolled into the RAB.