TransGrid

Revised revenue proposal

2014/15 – 2017/18

responsive
efficient
price aware

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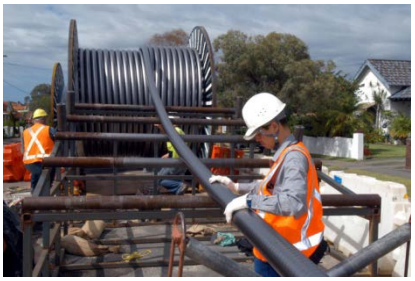

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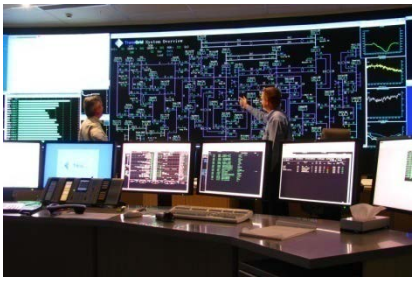

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1 Executive Summary

TransGrid is pleased to present its revised revenue proposal for the 2014/15 to 2017/18 period.

TransGrid submitted its revenue proposal to the Australian Energy Regulator (AER) on 2 June 2014. The revenue proposal set out the forecast expenditure and revenue required to provide electricity transmission services during the 2014/15 to 2017/18 period.

The AER published a draft decision on TransGrid's revenue proposal on 27 November 2014.

In response to the draft decision, TransGrid has submitted this revised revenue proposal to address matters raised in the draft decision. The revised proposal is for a four year period, as accepted by the AER in the draft decision.

In the revenue proposal, TransGrid proposed total forecast revenue of $3,975.5 million over four years. The AER's substitute revenue set out in the draft decision would provide total forecast revenue of $3,155.9 million over four years.

1.1 Capital Expenditure

In the revenue proposal, TransGrid proposed total forecast capital expenditure of $1,387.4 million for 2014/15 to 2017/18. In the draft decision, the AER substituted total forecast capital expenditure of $922.3 million for 2014/15 to 2017/18.

The AER accepted TransGrid's forecast capital expenditure for augmentation (including connections) and to support the business (other than strategic property acquisitions). It did not accept TransGrid's forecast capital expenditure for replacement, security/compliance and strategic property acquisition.

The AER substituted its own forecast of capital expenditure for the categories it did not accept, that is generally around 30% lower than TransGrid's forecast and 85% lower for the remediation of low spans.

TransGrid does not consider that the AER's substitute capital expenditure forecast would allow it the efficient costs of meeting the capital expenditure objectives. TransGrid considers that the AER's capital expenditure forecast understates the efficient costs of achieving the capital expenditure objectives because:

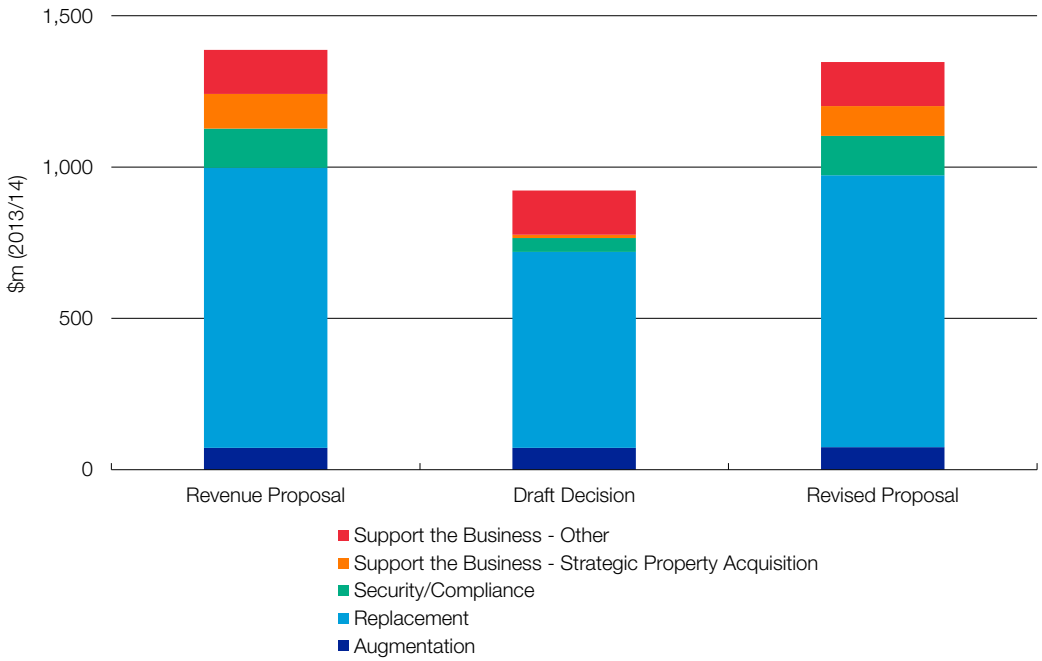
- the review of replacement expenditure undertaken by Energy Market Consulting associates (EMCa), on which the AER has relied, lacks analysis and sound reasoning;
- the rationale provided by the AER to reduce security/compliance expenditure is not well founded and absent a suitable risk analysis; and

- despite justifying reductions in expenditure on the basis that TransGrid had not provided a top-down assessment, the AER has failed to provide an adequate top-down assessment to justify its substitute forecast.

In this revised revenue proposal, TransGrid proposes a revised forecast of capital expenditure of $1,346.9 million for 2014/15 to 2017/18. TransGrid considers that this forecast allows it the efficient costs of meeting the capital expenditure objectives and is materially preferable to the AER's draft decision.

A comparison of forecast capital expenditure in the revenue proposal, draft decision and this revised revenue proposal is shown in Figure 1.1. This is shown in 2013/14 dollar terms for comparability.

Figure 1.1
Comparison of Forecast Capital Expenditure ($m 2013/14)



Source: TransGrid and AER.

TransGrid's revised forecast capital expenditure is shown in Table 1.1.

Table 1.1
Revised Forecast Capital Expenditure ($m nominal)

Category	2014/15 Expected	2015/16 Forecast	2016/17 Forecast	2017/18 Forecast
Augmentation	23.2	7.7	25.6	22.9
Replacement	252.7	268.8	224.9	206.8
Security/Compliance	31.5	24.8	31.9	51.2
Support the Business	**43.7**	**110.4**	**51.5**	**53.1**
Information Technology	19.8	20.7	19.5	23.0
Accommodation	8.8	11.5	5.2	0.0
Vehicles	9.2	8.1	10.0	11.7
Strategic Property	3.2	68.6	15.2	17.1
Other Business Support	2.6	1.5	1.6	1.3
Total	**351.0**	**411.7**	**333.9**	**334.0**

Source: TransGrid. Totals may not add due to rounding.

1.2 Operating Expenditure

In the revenue proposal, TransGrid proposed total forecast operating expenditure of $754.6 million for 2014/15 to 2017/18. In the draft decision, the AER substituted total forecast operating expenditure of $647.1 million for 2014/15 to 2017/18.

TransGrid is pleased that the AER accepted TransGrid's operating expenditure in 2012/13 as efficient base year expenditure, finding no evidence of material inefficiency.[1] The AER was also of the view that TransGrid's operating expenditure profile over time is consistent with a business responding to incentives to reduce operating expenditure.[2]

To forecast operating expenditure, the AER used its own operating expenditure model. The AER's approach to forecasting operating expenditure uses a base-step-trend approach for most categories, and assumed a forecast trend based on the results of the AER's partial factor productivity benchmarking. As the forecast from the AER's model was lower than TransGrid's forecast operating expenditure, the AER substituted its own forecast of operating expenditure.

TransGrid does not consider that the AER's substitute forecast of operating expenditure reasonably reflects the operating expenditure criteria. TransGrid considers that the AER's forecast understates the efficient costs of achieving the operating expenditure objectives because:

- the AER has applied base-step-trend forecasting and bottom-up forecasting inconsistently with its preferred methodology;

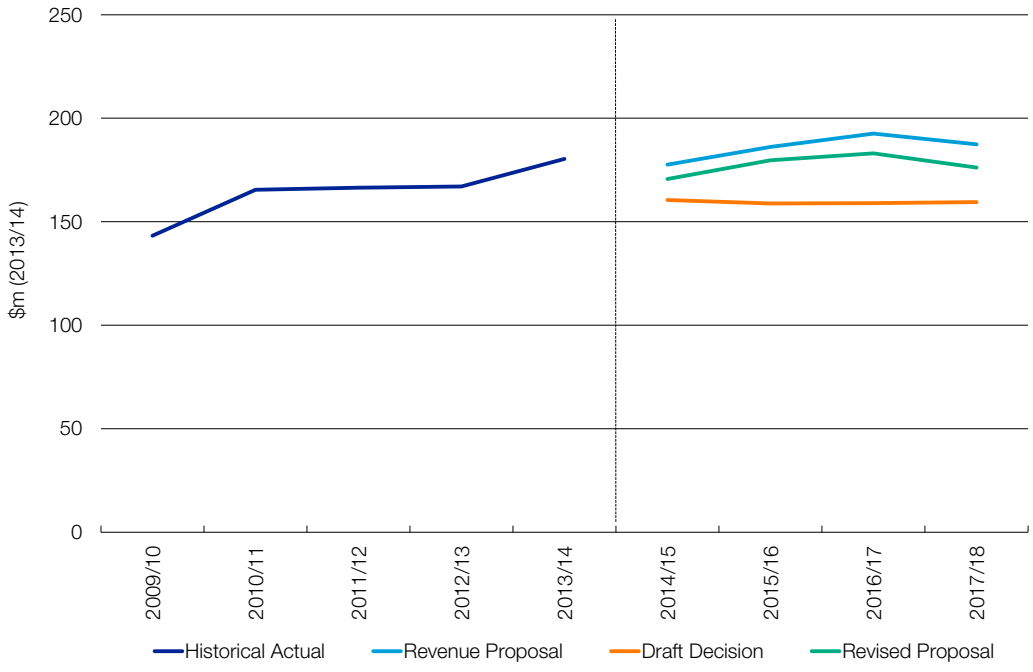
[1] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-31.
[2] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-32.

- the partial factor productivity benchmarking used by the AER to determine a forecast trend does not effectively measure the efficiency of TNSPs against the operating expenditure objectives and is not fit for purpose;
- the AER has not adequately considered the possibilities for substitution between capital and operating expenditure;
- the AER has not allowed expenditure to address the concerns of electricity consumers; and
- the inflation adjustments in the AER's forecasting model are incorrect.

In this revised revenue proposal, TransGrid proposes a revised forecast of operating expenditure of $709.6 million for 2014/15 to 2017/18. TransGrid considers that this forecast allows it the efficient costs of meeting the operating expenditure objectives and is materially preferable to the AER's draft decision.

A comparison of forecast operating expenditure in the revenue proposal, draft decision and this revised revenue proposal is shown in Figure 1.2. This is shown in 2013/14 dollar terms for comparability.

Figure 1.2
Comparison of Forecast Operating Expenditure ($m 2013/14)



Source: TransGrid and AER. Excludes debt raising costs.

TransGrid's revised forecast operating expenditure is shown in Table 1.2.

Table 1.2
Revised Forecast Operating Expenditure ($m nominal)

Category	2014/15 Expected	2015/16 Forecast	2016/17 Forecast	2017/18 Forecast
Maintenance	**77.9**	**86.5**	**91.4**	**83.8**
Maintenance	67.8	73.8	77.0	76.9
Major Operating Projects	10.1	12.7	14.4	6.9
Maintenance Support and Asset Management	11.5	11.9	12.3	12.8
System Operations	9.5	9.8	10.2	10.6
Grid Planning	10.2	10.6	11.0	11.4
Rates and Taxes	5.6	5.9	6.2	6.3
Property	3.4	1.5	1.5	1.6
Health, Safety and Environment	3.8	3.9	4.1	4.2
Information Technology	14.1	14.5	15.0	15.5
Business Administration	12.2	12.7	13.1	13.6
Corporate and Regulatory Management	23.2	27.5	27.7	29.0
Total Controllable Operating Expenditure	**171.4**	**184.7**	**192.4**	**188.8**
Debt Raising Costs	6.5	6.8	7.2	7.4
Insurance	6.1	6.8	7.6	8.5
Self Insurance	0.0	0.0	0.0	0.0
Network Support	0.0	0.0	0.0	0.0
Total	**184.0**	**198.4**	**207.1**	**204.6**

Source: TransGrid. Totals may not add due to rounding.

1.3 Allowed Rate of Return

In this revised proposal, TransGrid proposes a rate of return calculated by use of a weighted average cost of capital (WACC) of 8.65%. TransGrid considers that its approach to estimating the WACC is consistent with the Rules and best achieves the national electricity objective and the rate of return objective. This WACC is lower than the 8.83% proposed in the revenue proposal, reflecting the step down in the risk free rate since the revenue proposal was submitted.

The cost of debt in TransGrid's revenue proposal was consistent with the AER's *Rate of Return Guideline*, with the exception that TransGrid proposed that no transition to the historic trailing average methodology was warranted as TransGrid already applied a staggered debt portfolio that closely aligned with the AER's methodology. TransGrid

maintains that this position is correct and has provided advice from specialist corporate finance expert Professor Stephen Gray, who concurs.

The premise that a transition to the trailing average should be applied is to ensure that TransGrid is undercompensated in the current regulatory period in light of the prior regulatory period where the AER's allowance exceeded the actual cost of debt. Such a clawback is not consistent with the Rules, nor is it consistent with principles of incentive based regulation. The AER's expert, Dr Lally, is clear that there is no question of any windfall gain in the current period from moving directly to a trailing average cost of debt. On this basis, no transition is required.

TransGrid maintains that the Reserve Bank of Australia (RBA) is the preferred data source, but agrees for this regulatory decision to apply the AER's preferred methodology of averaging the RBA data with Bloomberg 7 year data where it is available; that is from 2012 onwards. For years prior to 2012, TransGrid maintains that the RBA is an independent, transparent, reputable and appropriate data source. TransGrid has also agreed to the AER's preferred approach of extrapolating the data to an effective 10 year term.

The AER's preferred methodology results in a small increase to the 10 year historic cost of debt for a benchmark efficient business of 7.92%. This rate should be updated annually to maintain the trailing average approach.

TransGrid believes the AER has erred in imposing a transition in its draft decision on the cost of debt. The correction of this error accounts for approximately 0.75% of the difference in WACC from the AER's draft determination to this revised proposal.

TransGrid's cost of equity proposal made a material departure from the AER's *Rate of Return Guideline*, having found that the AER's preferred approach was not compliant with the Rules. TransGrid's preferred methodology is to utilise all the relevant information from noted and respected financial theory models, an independent capital market expert's recent valuation of a business comparable to a benchmark efficient entity and a comparison of the estimated return on equity to observed debt yields as a means of a reasonableness check.

In this revised proposal, TransGrid has proposed a point estimate for the cost of equity of 9.75% that is materially lower than the estimate in TransGrid's revenue proposal, in light of movements in the risk free rate since the time of the revenue proposal submission. TransGrid is also mindful of feedback from stakeholders that suggested the rate was higher than necessary. This revised point estimate remains within the range proposed by TransGrid in the revenue proposal but reflects current market conditions.

TransGrid also submits a response by Grant Samuel to the AER's use of independent expert valuers' reports, and most specifically Grant Samuel's. Grant Samuel's paper asserts that the AER's application of the Sharpe-Lintner Capital Asset Pricing Model (SL CAPM) is inconsistent with the market practitioner's approach. In particular, Grant Samuel strongly disagrees with the AER's view of Dividend Growth Models (DGM) and the apparent inequity the AER has applied in assessing the value of DGM versus the SL CAPM. Grant Samuel also takes exception to the manner in which the AER represents Grant Samuel's data in regards to the Envestra valuation.

TransGrid believes the AER in its draft decision did not consider all relevant information in calculating an appropriate cost of equity. Correcting for this leads to an increase of about 0.66% from the AER's draft decision on the rate of return to that proposed by TransGrid in this revised proposal.

1.4 Maximum Allowed Revenue

TransGrid proposes the forecast revenue in Table 1.3 as the efficient revenue that is required for the provision of its transmission services. The revenue has been forecast taking into account TransGrid's revealed efficient costs, benchmark efficient costs for the rate of return and the regulatory and commercial risks involved in the provision of transmission services.

TransGrid's forecast satisfies both the national electricity objective and the revenue and pricing principles in the National Electricity Law.

Table 1.3
Revised Proposed Maximum Allowed Revenue ($m nominal)

	2014/15	2015/16	2016/17	2017/18
Return on Capital	525.7	548.8	576.1	595.1
Return of Capital (Regulatory Depreciation)	91.3	105.8	120.9	105.8
Operating Expenditure	184.0	198.4	207.1	204.6
Efficiency Carryover	23.1	14.2	16.6	25.7
Tax Allowance	39.3	42.5	62.0	63.4
Unsmoothed Revenue	**863.4**	**909.7**	**982.8**	**994.6**
Smoothed Revenue	**845.4**	**939.8**	**968.1**	**998.2**
X-Factor	11.71%	-8.45%	-0.50%	-0.60%

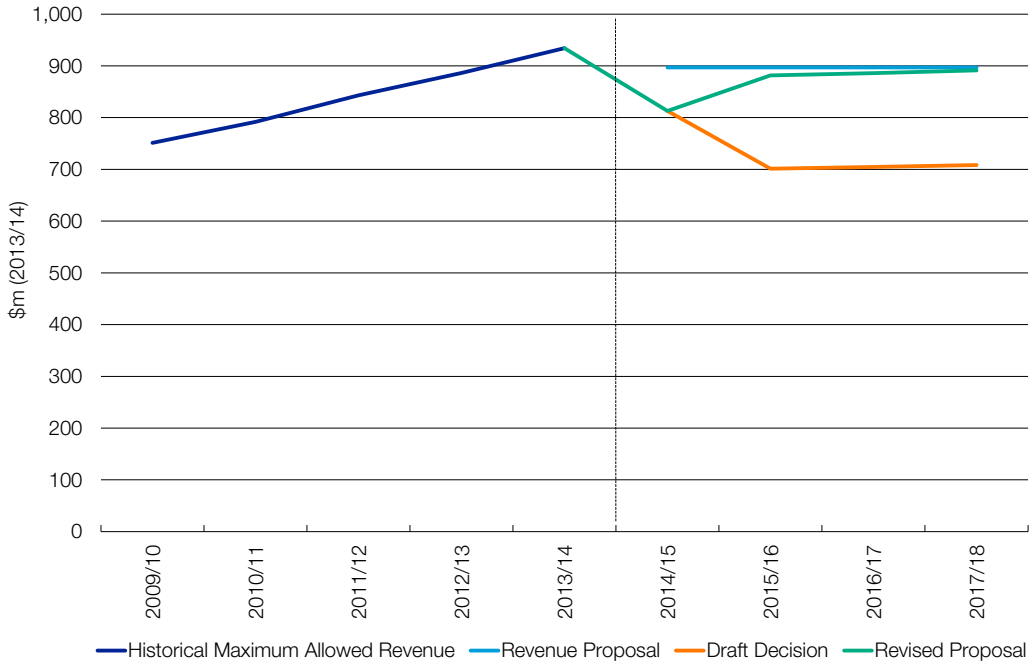
Source: TransGrid. Totals may not add due to rounding.

The revised total maximum allowed revenue is $3,751.4 million compared to the maximum allowed revenue in the revenue proposal of $3,975.5 million, reflecting a 6% reduction in proposed revenue over the period. The reduction in proposed revenue is mainly due to:

- a reduction in the proposed return on equity;
- a reduction in forecast operating expenditure;
- updates to take into account the most recent information, including demand forecasts and labour escalation; and
- a lower opening regulatory asset base (RAB) based on actual capital expenditure in 2013/14.

A comparison of the forecast revenue in the revenue proposal, draft decision and this revised revenue proposal is shown in Figure 1.3. This is shown in 2013/14 dollar terms for comparability.

Figure 1.3
Comparison of Forecast Revenue ($m 2013/14)



Source: TransGrid. Totals are smoothed maximum allowed revenue and do not reflect TransGrid's revenue freeze in 2013/14.

2 Introduction

TransGrid is pleased to present its revised revenue proposal for the 2014/15 to 2017/18 period.

TransGrid submitted its revenue proposal to the AER on 2 June 2014. The revenue proposal set out the forecast expenditure and revenue required to provide electricity transmission services during the upcoming regulatory control period.

The AER published a draft decision on TransGrid's revenue proposal on 27 November 2014.

In response to the draft decision, TransGrid has submitted this revised revenue proposal to address matters raised in the draft decision.[3]

2.1 Ongoing Dialogue with Consumers and Stakeholders

Since submitting its revenue proposal in June 2014, TransGrid has continued its dialogue and consultation with consumers and other stakeholders. This has included:

- discussions with those who made submissions to the AER on TransGrid's revenue proposal, to properly understand their concerns and consider how TransGrid could respond in this revised proposal;
- consultation on the issues facing the electricity supply for inner Sydney, and the timing and nature of the Powering Sydney's Future project;
- the 2014 New South Wales (NSW) Transmission Annual Planning Report (TAPR) forum;
- the 2014 demand management innovation forum;
- regional engagement forums;
- a workshop and webinar with consumer representatives and large energy users on the AER's draft decision, during the preparation of TransGrid's revised proposal; and
- ongoing consultation on TransGrid's pricing methodology.

The feedback received in these forums has led to a number of changes to this revised revenue proposal, compared to the revenue proposal and draft decision. These are listed in Chapter 3.

[3] *National Electricity Rules*, Clause 6A.12.3(b).

At the workshop on the draft decision, a number of participants suggested that TransGrid accept the AER's draft decision. TransGrid has considered this at senior management and board levels.

2.2 Response to Draft Decision

TransGrid has considered accepting the AER's draft decision. However, following a careful review of the draft decision, TransGrid does not consider that it would be in the long-term interests of consumers to accept it.

TransGrid considers that the draft decision does not contribute to the national electricity objective to the greatest degree or adequately take into account the revenue and pricing principles in the *National Electricity Law*, as claimed by the AER. TransGrid also considers that the draft decision contains errors and exhibits incorrect exercise of discretion.

In preparing this revised proposal, TransGrid has been mindful of the feedback from consumers in support of the draft decision and has sought to avoid focusing on minutiae or immaterial matters. Where possible, TransGrid has accepted the matters raised by the AER in the draft decision. Therefore, the issues addressed in this revised proposal are those in which TransGrid believes the AER to have made material error or exercised discretion in a way that is not in the long term interests of consumers.

This revised revenue proposal sets out the reasons for TransGrid's view, and proposes revised forecasts of expenditure and revenue that TransGrid considers contribute to the national electricity objective to the greatest degree and are materially preferable to those in the draft AER's decision.

2.2.1 Contribution to the National Electricity Objective

The national electricity objective is:

> 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—
>
> (a) price, quality, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system.[4]

TransGrid is concerned that the draft decision does not strike an appropriate balance between the elements of the national electricity objective. Rather, it appears to be focused towards achieving a particular price outcome in the short term.

In the overview of the draft decision, the AER stated that:

> The total allowed revenue we have determined is broadly in line with the trend in revenue that was allowed in the 2004–09 regulatory control period.[5]

In TransGrid's view, the AER has not substantiated that a return to this trend satisfies the national electricity objective to the greatest degree or satisfies the revenue and pricing principles in the *National Electricity Law*.

In this revised proposal, TransGrid provides detail to demonstrate that the draft decision is:

- reliant on inappropriate assumptions, that empirically do not hold;

[4] *National Electricity Law*, Section 7.
[5] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Overview*, November 2014, p10.

- reliant on assertions that are unsupported by analysis or adequate reasoning;
- reliant on assessment techniques that have been demonstrated to not be fit for purpose;
- selective, having inadequate regard to the information TransGrid provided the AER, both in the submission of its revenue proposal and in response to questions asked by the AER and its consultants during their review; and
- based on substitute forecasts that lack assessment of their effects on risk.

TransGrid considers that a decision characterised by these systemic issues cannot be in the long term interests of consumers, and will not satisfy the national electricity objective or the revenue and pricing principles in the *National Electricity Law*. Conversely, the correct application of the Rules is likely to result in the advancement of the national electricity objective to the greatest degree.

2.3 Changes Since Revenue Proposal

TransGrid is aware of a number of changes since it submitted its revenue proposal in June 2014:

- connection point demand forecasts have been updated;
- TransGrid has obtained further detail on the price change for rental of radio repeater sites on crown lands; and
- some minor corrections to capital and operating expenditure forecasts were identified during the AER's review.

TransGrid has taken these changes into account in the forecasts in this revised proposal.

2.4 Length of Regulatory Control Period

In the revenue proposal, TransGrid proposed a four year overall period from 2014/15 to 2017/18. This was allowed under the transitional arrangements in the *Economic Regulation of Network Service Providers* rule change[6] to enable TNSPs and the AER to optimise the alignment of regulatory reviews across all TNSPs, which the AEMC considered may be desirable from both a resourcing and benchmarking perspective.[7]

In the draft decision, the AER accepted TransGrid's proposal on the length of the regulatory control period. TransGrid accepts the draft decision on the length of the regulatory control period.

Therefore, this revised revenue proposal is for a the four year overall period comprising a one year transitional regulatory control period commencing on 1 July 2014 and a three year subsequent regulatory control period commencing on 1 July 2015.

2.5 Negotiating Framework and Pricing Methodology

TransGrid submitted a proposed negotiating framework and pricing methodology with its revenue proposal, as required by the National Electricity Rules.[8]

[6] *National Electricity Rules*, Clause 11.58.4(l).
[7] AEMC, *Rule Determination, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, p245.
[8] *National Electricity Rules*, Clause 6A.10.1.

In the draft decision, the AER approved TransGrid's proposed negotiating framework.[9] TransGrid accepts the AER's approval of its negotiating framework, and has not submitted a revised negotiating framework with this revised revenue proposal.

In the draft decision, the AER did not approve TransGrid's pricing methodology.[10] TransGrid has submitted a revised pricing methodology that addresses the matters the AER raised in the draft decision as Appendix AA to this revised proposal, and an explanatory statement as Appendix Z.

2.6 Basis of Numbers

In this proposal, historical expenditure is presented in nominal December dollars, in alignment with annual regulatory reporting. Forecast expenditure is presented in nominal June dollars, in alignment with the post-tax revenue model (PTRM).

Comparisons and trends of historical and forecast expenditure are presented in real December 2013 (2013/14) dollars.

2.7 Confidential Information

TransGrid has identified confidential information in:

- Appendix U – Statement on the Development of TransGrid's Debt Management Policy;
- Appendix V – Proposed Averaging Period; and
- Appendix X – Pass Through Events: Key Risks and Relevant Limits.

TransGrid has provided both public and confidential versions of Appendix U and Appendix X. As the entirety of Appendix V is confidential, TransGrid has not provided a public version.

TransGrid has not identified any other aspects of this revised revenue proposal, including appendices, to be confidential.

[9] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 14 – Negotiated Services*, 27 November 2014, p14-7.
[10] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 12 – Pricing Methodology*, 27 November 2014, p12-7.

3 Consumer Feedback

Over the last two years, TransGrid has introduced a focus on intentional and meaningful consultation with consumers about key elements of its direction and investment plans.

TransGrid has continued to seek to understand the advice, perspectives and value judgements of consumers and consumer representatives since the submission of its revenue proposal. This has involved a number of forums:

- discussions with those who made submissions to the AER on TransGrid's revenue proposal, to properly understand their concerns and consider how TransGrid could respond in this revised proposal;
- consultation on the issues facing the electricity supply for inner Sydney, and the timing and nature of the Powering Sydney's Future project;
- the 2014 NSW Transmission Annual Planning Report (TAPR) forum;
- the 2014 demand management innovation forum;
- regional engagement forums; and
- a workshop and webinar with consumer representatives and large energy users on the AER's draft decision, during the preparation of TransGrid's revised proposal.

A record of the discussions and feedback from the December 2014 workshop and webinar on the draft decision is provided in the report *TransGrid Consultation Report: Large Energy Users and Consumer, Business and Industry Groups* prepared by the independent facilitator, Newgate Research. This report is available on TransGrid's "Have Your Say" website, www.yoursaytransgrid.com.au.

TransGrid engaged the University of Technology Sydney's (UTS) Australian Centre of Excellence for Local Government to review and assess the consumer engagement process that TransGrid has introduced over the past 18 months. UTS has provided a comprehensive review of the quality of TransGrid's process. TransGrid believes this provides an important and balanced perspective into the current debate in light of the evolving position on consumer engagement reflected in the AER's draft decision. TransGrid has included this report as Appendix A.

A summary of the discussions at TransGrid's forums and its application of the feedback is attached as Appendix B.

The feedback received in these forums has led to a number of changes to this revised revenue proposal, compared to the revenue proposal and draft decision. These are listed in Table 3.1.

Table 3.1
Incorporation of Consumer Feedback

Topic	Feedback Incorporated
Transmission pricing	At the webinar in December 2014, TransGrid discussed transitional issues of concern with the move to demand based rather than energy based charging for the postage stamp component of transmission pricing. This followed the rejection of TransGrid's proposed transitional "side constraint" by the AER. Consumers suggested that the use of annual maximum demand may be preferable to monthly maximum demand, which was originally proposed. TransGrid has analysed the use of annual maximum demand and found it preferable to monthly maximum demand, and that it minimises transitional issues. Therefore, TransGrid has adopted the approach proposed by consumers.
Rate of return	In submissions and at the workshop on the draft decision, consumers expressed a view that TransGrid's proposed rate of return is too high. In this revised proposal, TransGrid has reduced its proposed cost of equity by adopting a lower point estimate within the reasonable range.
Demand management	At the workshop on the draft decision, consumers expressed concern that the AER had not recognised the importance of demand management. There was a widely held view that work in this area should be continued by TransGrid, which was also clear at the demand management innovation forum. TransGrid has therefore reinstated a proposed increase to the demand management innovation allowance that the AER rejected in the draft decision. Some organisations that made submissions on the revenue proposal expressed concern with TransGrid's proposed pre-emptive network support to meet the Powering Sydney's Future need. As the timing of this need has been deferred due to updates in demand forecasts, the revised revenue proposal does not propose pre-emptive network support.
Capital expenditure	Consumers echoed the AER's comments in the draft decision that TransGrid had not provided a top-down assessment of its forecast capital expenditure, and therefore had not demonstrated overall restraint. At the workshop on the draft decision, TransGrid sought the views of participants on how other businesses apply top-down assessments. In many cases, these assessments are driven by factors such as corporate financial position and international market conditions, which are less applicable to TransGrid. TransGrid has proposed a top-down assessment in this revised proposal. The top-down assessment indicates that a suitable level of restraint has been applied to TransGrid's forecast capital expenditure.

Table 3.1
Incorporation of Consumer Feedback (cont'd)

Topic	Feedback Incorporated
Operating expenditure	At the workshop on the draft decision, consumers generally supported the AER's substitute forecast operating expenditure. There was recognition that there was specific expenditure that is not reflected in TransGrid's historical operating expenditure, such as the decommissioning of the Wallerawang to Orange North 132kV transmission line, as TransGrid has not historically had the need to decommission assets that are not otherwise replaced. TransGrid has updated the AER's forecast operating expenditure in the draft decision to correct for errors and inconsistencies in the approach and incorporate the most recent information in the output change and productivity change trends. The resulting forecast is higher than the revised forecast developed using TransGrid's methodology. On this basis, TransGrid has proposed forecast operating expenditure based on its own methodology in this revised revenue proposal, updated for the matters it has accepted from the AER's draft decision and the most recent information.
Approach to consumer engagement	Participants in TransGrid's consumer workshops noted an improved approach to engagement with large users and consumer, business and industry groups over the past year, and expressed a strong desire to see this continued. Participants made it clear that they expect to see value from the consumer engagement through a reduction in electricity prices. TransGrid has made changes to the forecasts in this revised revenue proposal in response to consumer feedback, as set out above.

4 Benchmarking

Benchmarking has been a requirement of the current regulatory framework since it was established in 2006.

TransGrid has a long history of benchmarking. It has participated in benchmarking studies for over 20 years to understand its performance against peers worldwide, pursue process improvements and achieve efficiencies that have delivered benefits for consumers.

In its revenue proposal, TransGrid presented a range of benchmarking metrics relating to capital and operating expenditure. These metrics demonstrate the efficiency of TransGrid's capital and operating expenditure.

The AER has used benchmarking techniques in its draft decision in two ways:

- to forecast a rate of change for operating expenditure; and
- to inform its assessment of TransGrid's proposed forecast capital expenditure.

The AER's first annual benchmarking report, published concurrently with the draft decision, presents the results of multilateral total factor productivity (MTFP) benchmarking and partial productivity indicators (PPIs). The AER's draft decision relies on further benchmarking work on operating expenditure partial factor productivity (PFP), based on the same model and data set as the MTFP in the annual benchmarking report.

TransGrid realises that the benchmarking under development by the AER is in its infancy, and is willing to work with the AER to develop appropriate benchmarking approaches over time. However, TransGrid does not consider the complex statistical techniques of MTFP and PFP suitable nor preferable at this time to less complex and widely accepted techniques in forecasting capital and operating expenditure, as set out in Chapters 5 and 6.

This chapter sets out TransGrid's concerns with the benchmarking techniques used by the AER.

4.1 Annual Benchmarking Report

In the *Economic Regulation of Network Service Providers* rule change in 2012, the AEMC placed obligations on the AER to publish annual benchmarking reports, with the first report to be published by 30 September 2014.

In September 2014, the AER advised that it had delayed the publication of the first benchmarking report to late November 2014. TransGrid notes that the AER's action to delay the publication of the report is non-compliant with Clause 6A.31(d) of the Rules.

TransGrid has reviewed the economic benchmarking report published by the AER, and had previously reviewed an earlier draft on which the AER was required to seek submissions

under Clause 8.7.4(c) of the National Electricity Rules. TransGrid provided a number of comments to the AER on the draft report that were not addressed in the final report.[11]

In the annual benchmarking report, the AER presented two benchmarking techniques: multilateral total factor productivity (MTFP) and partial productivity indicators (PPIs).

4.1.1 Multilateral Total Factor Productivity

Total factor productivity (TFP) is a type of productivity measure that measures total output relative to an index of all inputs used. Total factor productivity indexes are formed by aggregating output quantities into a measure of total output quantity and aggregating input quantities into a measure of total input quantity. The technique can be used with any measure of output compared to any measure of input.

As the AER has correctly identified, there are a number of issues with the application of economic benchmarking techniques such as MTFP to electricity transmission networks in Australia.[12]

In a review on the use of TFP in regulatory determinations in 2011, the AEMC identified some fundamental issues with the application of TFP to electricity transmission networks:

> … we agree that it appears unlikely that it would be appropriate to implement a TFP methodology either for the gas transmission sector or the electricity transmission sector… Applying a full TFP-based methodology in the electricity transmission sector may not be effective because of the difficulty in measuring outputs related to system security and reliability, the lumpiness of capital expenditure and given the small number of service providers.[13]

More recently, the Productivity Commission also noted limitations on the feasibility of economic benchmarking techniques in its inquiry on electricity network regulatory frameworks:

> There are only 13 distribution businesses, five regional transmission businesses and three separate direct current interconnectors in Australia. This reduces the feasibility for more elaborate models that take into account the multiple environmental factors affecting inter-firm performance.[14]

In the same report, the Productivity Commission set out the key difficulties with benchmarking that place limitations on the appropriate use of benchmarking in revenue determinations, as cited on page 21. The Commission considered that:

> Given the difficulties outlined in box 1, benchmarking is not *yet* sufficiently reliable and robust to directly set regulated revenue allowances. A particular concern is that it is difficult to distinguish between inefficiency and errors arising from model misspecification, poor data, different regulatory settings and varying operating environments.
>
> Such difficulties are less severe if the purpose of benchmarking is to identify broad efficiency concerns about network businesses. However, in setting regulatory allowances, badly configured benchmarks could lead to under-remuneration of businesses, with risks for efficient investments and business solvency.[15]

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[11] TransGrid, *Draft Annual Benchmarking Report for Electricity Transmission Network Service Providers*, 22 August 2014.
[12] AER, *Electricity Transmission Network Service Providers Annual Benchmarking Report*, November 2014, p6.
[13] AEMC, *Final Report: Review into the Use of Total Factor Productivity for the Determination of Prices and Revenues*, 30 June 2011, pp32-33.
[14] Productivity Commission, *Electricity Network Regulatory Frameworks: Productivity Commission Inquiry Report: Volume 1*, 9 April 2013, p176.
[15] Productivity Commission, *Electricity Network Regulatory Frameworks: Productivity Commission Inquiry Report: Volume 1*, 9 April 2013, p29.

The Difficulties With Benchmarking[16]

While benchmarking methods are often sophisticated, there are many problems in applying them and uncertainties about the accuracy and robustness of the results:

(a) There are many different methods for estimating 'efficient' costs. They revolve around the assumption that unexplained differences in the performance of firms reflect managerial inefficiency. Different approaches can result in divergent measures of efficiency – which may not be a sound basis for regulating future revenue or prices.

(b) Incentive regulations require a reward for the vigorous (and risky) pursuit of cost efficiency. Setting the benchmark to that of the highest performer dulls those incentives since no one would have an incentive to be the leader. However, setting the benchmark at the lower end of performance takes pressure off inefficient businesses. The decision about where to set the line is difficult and involves judgment.

(c) Quality must not be overlooked. A business subject to incentive regulation may appear to be performing efficiently in cost terms, but may lower its quality. This is why, regardless of the regime used to set revenue allowances, complementary regulation or incentive schemes specifically related to reliability and safety, are also necessary. This is much more difficult in transmission where there are few good leading output measures of likely future reliability performance.

(d) Different reporting systems produce measurement errors.

(e) Any comparisons between businesses must take into account differences in their operational circumstances (such as topography, customer density, and differences between jurisdictions about which assets lie within transmission or distribution networks) and policy constraints (such as higher or differently defined reliability standards or statutory requirements for non-commercial goals for state-owned corporations). Much of the international academic literature on benchmarking uses too few variables to draw strong inferences about the efficiency of specific firms.

(f) There are only 13 distribution businesses, five regional transmission businesses and three separate DC interconnectors in Australia, which reduces the capacity for elaborate models that take into account (e). It also means that the performance bar might be set quite low if the highest performing Australian business were still quite inefficient. International benchmarking might assist, but has to be interpreted carefully given that adjusting for the differences noted in (d) and (e) may increase the number of variables at a higher rate than the additional number of businesses used in benchmarking.

These difficulties have not adequately been addressed by the AER in its use of benchmarking in the draft decision.

Despite the well known and widely recognised issues with the application of economic benchmarking to electricity transmission networks in Australia, the AER has persisted to draw conclusions from the results of its MTFP benchmarking, despite its own admission that the benchmarking is in its infancy. In its economic benchmarking report, the AER stated that:

[16] This information has been cited verbatim from Productivity Commission, *Electricity Network Regulatory Frameworks: Productivity Commission Inquiry Report: Volume 1*, 9 April 2013, p30.

> We are confident we can draw conclusions on the change in transmission networks' productivity over time. Such analysis involves comparing a transmission network's performance with its past performance and thus avoids the complications of benchmarking across networks.[17]

TransGrid considers that the AER's confidence in its MTFP benchmarking is ill-founded.

TransGrid has significant concerns with the MTFP benchmarking the AER has used and does not consider that it is robust or provides a good measure of the efficiency of TNSPs, either across TNSPs or over time.

This is because:

1. the output specification used for the MTFP does not align with the capital or operating expenditure objectives in the National Electricity Rules, and therefore with the cost drivers of TNSPs;
2. the MTFP model has a high degree of uncertainty and demonstrates significant sensitivity to changes in the model specification or source data;
3. the results of the MTFP model are consistent with a bias toward smaller TNSPs;
4. the AER has not adequately considered exogenous factors that are characteristic of different operating environments and therefore influence cost drivers between TNSPs; and
5. the voltage-weighted entry and exit connections output has not been recorded on a consistent basis between TNSPs.

For these reasons, TransGrid does not consider the AER's MTFP benchmarking to be fit for purpose for use in a revenue determination. The rationale for TransGrid's view is set out in the following sections.

The MTFP Output Specification Does Not Align with Expenditure Objectives

A MTFP index is a ratio of business outputs to inputs over time.

The selection of inputs is described by the input specification, and the selection of outputs by the output specification. While the input specification is reasonably straightforward, for TNSPs the output specification is not straightforward.

TransGrid engaged HoustonKemp to provide advice on the AER's use of benchmarking in its annual benchmarking report and draft decision. HoustonKemp explains that:

> The specification of outputs is therefore a non-trivial process, because our ability to describe and, more importantly, to understand the interaction of different outputs with one another is limited. Put another way, there is no obvious formula for the 'output' of a TNSP.
>
> Given that it is not possible to derive an explicit formula for a TNSP's output, an MTFP analysis of electricity transmission businesses relies on assumptions as to:
>
> - which outputs/inputs are to be included; and
> - the interactions between each output – ie, the degree to which production of one dimension of output is dependent on or correlated with the production of other dimensions of output.
>
> The selection of outputs and inputs included in the specification is a non-trivial process. Different choices will lead to different results, and may well affect the conclusions drawn from the analysis.[18]

[17] AER, *Electricity Transmission Network Service Providers Annual Benchmarking Report*, November 2014, p6.
[18] HoustonKemp, *Review of the AER transmission network benchmarking study*, December 2014, p2.

For MTFP benchmarking to provide meaningful information on a TNSP's efficiency, the output specification must align with the TNSP's obligations against which its efficiency is measured. If it does not align, the MTFP does not measure efficiency, but only observations about a subjective specification of productivity that bears a limited relationship to efficiency.

For a TNSP, the expenditure criteria[19] in Chapter 6A of the National Electricity Rules specify that a TNSP's efficiency for the purpose of a revenue determination is to be assessed with regard to the expenditure objectives.[20] That is, for MTFP to provide a measure of a TNSP's efficiency, the output specification would need to closely reflect the expenditure objectives. The output specification used by the AER does not.

The output specification used by the AER and developed by its benchmarking consultant, Economic Insights, has five outputs:

- energy throughput;
- ratcheted maximum demand;
- voltage-weighted entry and exit connections;
- circuit length; and
- reliability, measured by energy not supplied.[21]

The AER's benchmarking consultant, Economic Insights, claims that this output specification performs well against the AER's selection criteria,[22] which include alignment with the National Electricity Law and National Electricity Rules objectives.

TransGrid disagrees.

The expenditure objectives[23] stated in the National Electricity Rules are to:

1. Meet or manage the expected demand for prescribed transmission services over that period
2. Comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services
3. 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
4. Maintain the safety of the transmission system through the supply of prescribed transmission services.[24]

[19] These include the operating expenditure criteria in Clause 6A.6.6(c) and capital expenditure criteria in Clause 6A.6.7(c) of the National Electricity Rules.
[20] These include the operating expenditure objectives in Clause 6A.6.6(a) and capital expenditure objectives in Clause 6A.6.7(a) of the National Electricity Rules.
[21] Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and Tasmanian Electricity TNSPs*, 10 November 2014, p9.
[22] Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and Tasmanian Electricity TNSPs*, 10 November 2014, p9.
[23] The operating expenditure objectives are set out in Clause 6A.6.6(a) and capital expenditure objectives in Clause 6A.6.7(a). As they are the same, they are referenced here simply as the "expenditure objectives".

A comparison of the output specification used by Economic Insights and the expenditure objectives in the National Electricity Rules is shown in Table 4.1. This comparison shows that the alignment between the two is limited.

Table 4.1
Comparison of Output Specification and Expenditure Objectives

Expenditure Objective	Objective	Output Specification	Alignment
1	Meet or manage the expected demand	Ratcheted maximum demand	Align
2	Comply with all applicable regulatory obligations or requirements	–	Not measured in output specification
3 (iii)	Maintain the quality of supply	–	Not measured in output specification
3 (iii)	Maintain the reliability of supply	Reliability	Align
3 (iii)	Maintain the security of supply	–	Not measured in output specification
3 (iv)	Maintain the reliability of the transmission system	Reliability	Align
3 (iv)	Maintain the security of the transmission system	–	Not measured in output specification
4	Maintain the safety of the transmission system	–	Not measured in output specification
–	–	Energy throughput	Not an obligation in expenditure objectives
–	–	Voltage-weighted entry and exit connections	This is a material exogenous factor and is reasonable to include in model
–	–	Circuit length	This is a material exogenous factor and is reasonable to include in model

From the comparison, it is evident that there is limited alignment between the output specification and expenditure objectives. In particular, the key obligations of compliance with applicable regulatory obligations, quality of supply, security and safety of the transmission system are missing from the output specification.

[24] *National Electricity Rules*, Clauses 6A.6.6(a) and 6A.6.7(a).

The AER stated in its annual benchmarking report that:

> In this report we have chosen to focus on the core services involved in the transmission of electricity provided by transmission networks. The transmission networks provide other services such as:
>
> - Supporting unrestrained competition within the NEM.
> - Ensuring voltage stability
> - System security functions such as maintaining load shedding, and restarting the system in the event of an outage
>
> Though important, we consider that these measures may not be significant enough to warrant inclusion in whole of business benchmarking.[25]

TransGrid considers that the services listed by the AER *are* core services involved in the transmission of electricity, as evidenced by their inclusion in the expenditure objectives and Schedule 5.1a relating to system standards in the National Electricity Rules. While the AER has surmised that the measures may not be significant enough to warrant inclusion in whole of business benchmarking, it has not provided analysis or rationale to demonstrate this. Indeed, the converse may instead be the case and the measures may be significant enough to warrant inclusion in whole of business benchmarking. TransGrid considers that this is more likely.

At the very least, the activities and investments required to provide these services will differ depending on the characteristics of individual parts of the network, such as heavily meshed areas, radial or long areas, and interconnectors. It is also likely that the cost of providing these services will differ between different parts of the transmission networks.

The AER's benchmarking consultant, Economic Insights, suggests that some of the system capacity measures it has selected reflect the quality, reliability and security of prescribed transmission services.

> This specification performs well using the selection criteria listed in Economic Insights (2013)… By including the key dimensions of system capacity it recognises the importance of maintaining the quality, reliability and security of prescribed transmission services.[26]

TransGrid considers that there are limited, if any, causal links between system capacity and the quality, reliability and security of prescribed transmission services. The requirements for quality and security of supply are set out in Schedules 5.1 and 5.1a of the National Electricity Rules and jurisdictional planning requirements. They are not trivial, and TransGrid does not consider it possible that these requirements could be represented or even roughly approximated by simple measures of system capacity. If this measure were to be used going forward, the AER and Economic Insights would need to demonstrate its suitability.

Economic Insights has not mentioned the fourth expenditure objective, on maintaining the safety of the transmission system, in its discussion of the suitability of the output specification.

Further to issues of quality, security and safety, TNSPs also provide the platform on which the competitive wholesale electricity market operates. They do this by providing sufficient capacity and interconnection with other states for generators to be able to deliver their output to meet demand, and therefore to be able to effectively compete with each other and generators in other states. The benefit to consumers of an unconstrained transmission

[25] AER, *Electricity Transmission Network Service Providers Annual Benchmarking Report*, November 2014, p17.
[26] Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and Tasmanian Electricity TNSPs*, 10 November 2014, p9.

network is not measured in the output specification. However, the importance of this output is evidenced by the fact that the AER has implemented an incentive scheme for TNSPs to improve the management of market constraints, which has been in place since 2009.

The output specification also includes the measure of energy throughput. However, TransGrid has no obligations relating to energy throughput in the National Electricity Rules or applicable regulatory obligations. Therefore, in measuring energy throughput, the model is measuring an output that is not an obligation or a key cost driver for TransGrid.

The consequence of poor alignment between the output specification and expenditure objectives is that the output specification measures a construction of outputs that has been subjectively selected and does not closely align with TransGrid's obligations. As stated earlier, the expenditure objectives are the obligations against which the Rules require the AER to assess efficiency in the making of a revenue determination.

For these reasons, TransGrid does not consider the AER's MTFP benchmarking to be fit for purpose for use in determining the level of efficient costs in a revenue determination.

The TFP Model Has High Uncertainty and Sensitivity

TransGrid has engaged HoustonKemp to provide expert advice on benchmarking of TNSPs and examine the robustness of the AER's MTFP model. The report providing HoustonKemp's assessment and findings is attached as Appendix C.

HoustonKemp has found that the results derived from the model are not robust, that is, small changes to the input assumptions, or the adoption of equally valid alternative model specifications, can effect marked changes in the results. This is based on three findings:

- the output weights derived by the model are highly uncertain, even in the model's own terms;
- the output weights are sensitive to changes in input data; and
- alternative model specifications lead to considerable changes in results.[27]

HoustonKemp considers that this lack of robustness has implications for how the AER has used the results from the MTFP analysis in its draft decision for TransGrid:

> The variation in outcomes emphasises that the results of the analysis are heavily influenced by the decision to adopt one specification over another – a decision that we have already explained is inherently subjective.
>
> The differing results suggest that the relative performance of TNSPs as measured by the MTFP index is highly conditional on the specification adopted. For this reason alone, we caution against drawing conclusions as to the relative productivity of any particular TNSP from this analysis.[28]

The cautions expressed by HoustonKemp are corroborated to some degree by the AER's own consultant, Economic Insights:

> We present an illustrative set of MTFP results using an output specification analogous to our preferred specification for DNSPs but caution against drawing strong inferences about TNSP efficiency levels from these results.[29]

[27] HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014, p9.
[28] HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014, p15.
[29] Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and Tasmanian Electricity TNSPs*, 10 November 2014, p2. Similar statements are repeated on pp6,12.

Further, the AER has acknowledged the sensitivity of the results to the model specification in its benchmarking report:

> In developing its preferred output specification, Economic Insights considered a number of other specifications. The MTFP scores of the transmission networks shifted somewhat depending on the model specification used.[30]

However, the AER has disregarded these cautions in its draft decision. For example, the AER used the MTFP results in its assessment of TransGrid's forecast capital expenditure:

> We have looked at a number of historical metrics of TransGrid's capex performance to help inform our assessment of TransGrid's proposed capex forecast. This includes TransGrid's relative multilateral total factor productivity (MTFP) performance from our annual benchmarking report, and its proposed forecast capex allowance against historical trends.
>
> Generally, these results show that, while TransGrid is proposing lower capex than its historical average, its overall expenditure efficiency is materially lower than that achieved by TasNetworks and ElectraNet. More importantly, its capital efficiency has been steadily declining over time. These observations suggest that there is the potential for efficiencies to be found in TransGrid's proposed forecast capex.
>
> …
>
> These results show that TransGrid's efficiency is low and has been declined steadily over time.[31]

Given that the AER's own consultants caution against using the results to draw inferences on TransGrid's efficiency, TransGrid considers that the AER is not justified in drawing conclusions from its MTFP results. TransGrid considers that the AER and Economic Insights have not demonstrated sufficient robustness in the MTFP model.

The TFP Model Appears to be Biased Toward Smaller TNSPs

In the development of the MTFP output specification, one of the factors considered by Economic Insights for each potential output specification was whether it favoured any particular type of TNSP, for example, depending on size.[32] Economic Insights commented that the output specification it ultimately selected, "did not appear to favour any particular type of TNSP."[33] However, it did not provide any reasoning or analysis to support the comment, beyond subjective judgement.

As TransGrid stated in its comments to the AER on a draft of the annual benchmarking report:

> TransGrid notes that the MTFP presented based on this output specification shows similar results for the two smaller TNSPs – TasNetworks and ElectraNet, and similar results for the three larger TNSPs – Powerlink, TransGrid and AusNet Services. This observation may indicate that the model in fact favours smaller TNSPs, and considers that further evidence would be necessary to support Economic Insights' assertion that the specification did not favour any particular type of TNSP (if, in fact, this is the case).[34]

In the absence of evidence that the output specification does not favour any particular type of TNSP, TransGrid continues to be concerned that the results of the MTFP benchmarking appear consistent with results that favour smaller TNSPs. This may be exacerbated by inadequate consideration of exogenous factors.

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[30] AER, *Electricity Transmission Network Service Providers Annual Benchmarking Report*, November 2014, p27.
[31] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure*, November 2014, p6-19.
[32] Economic Insights, *Memorandum: TNSP MTFP Results*, 31 July 2014, pp2-4.
[33] Economic Insights, *Memorandum: TNSP MTFP Results*, 31 July 2014, p3.
[34] TransGrid, *Draft Annual Benchmarking Report for Electricity Transmission Network Service Providers*, 22 August 2014, p2.

The AER Has Not Adequately Considered Exogenous Factors

To benchmark meaningfully, it is necessary to consider the exogenous factors that each TNSP faces and take these factors into account. In its *Economic Regulation of Network Service Providers* rule change, the AEMC correctly stated that:

> The Commission views benchmarking as a critical exercise in assessing the efficiency of a NSP and in approving capex and opex allowances. Benchmarking should take into account differences in the environments of the different NSPs, being those factors that are outside the control of the NSP.
>
> …
>
> On this basis the AER should publish annual benchmarking reports, setting out the relative efficiencies of distribution network service providers (DNSPs) and transmission network service providers (TNSPs), taking into account the exogenous factors that distinguish them.[35]

However, the AER has not adequately taken into account the exogenous factors that distinguish TNSPs in its benchmarking. In its annual benchmarking report, it states:

> We have accounted for a number of operating environment differences in our benchmarking analysis. There are other differences between the operating environments of transmission networks in Australia. The impact of these operating environment factors is a matter of contention.
>
> …
>
> That being said, we have not accounted for every potential operating environment factor that may affect relative efficiency of transmission networks. As such, there may remain some unquantified operating environment factors. The presence of unquantified differences in the operating environment does not preclude us or other parties from forming a quantified view about the relative efficiency of transmission networks. It may be that the net impact of some operating environment factors will be immaterial to the consideration of efficiency. Further, the gap in relative efficiency may prove to be so great that operating environment factors alone could not account for the difference in relative efficiency.[36]

Surmising that the impact of some exogenous operating environment factors "may" be immaterial to the consideration of efficiency does not constitute taking them into account, as they equally may be material. Similarly, while the gap in relative efficiency "may" be so great that exogenous operating environment factors alone could not account for the difference, it equally may not. The AER has provided no analysis to demonstrate the materiality of exogenous factors, and provided no rationale explaining why it chose to take certain factors into account and why it chose not to take other factors into account.

TransGrid raised this issue with the AER in its comments on a draft of the benchmarking report:

> … the AER and Economic Insights have not clearly articulated those environmental factors that have been applied in the MTFP model and the rationale for their selection as material environmental factors. Nor have they specified those factors that have not been applied in the MTFP model and their rationale for rejection as material environmental factors. It is unclear how those environmental factors that have been selected have been applied in the model.[37]

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[35] AEMC, *Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, pp25-26.
[36] AER, *Electricity Transmission Network Service Providers Annual Benchmarking Report*, November 2014, pp19-20.
[37] TransGrid, *Draft Annual Benchmarking Report for Electricity Transmission Network Service Providers*, 22 August 2014, p2.

As a consequence, the differences in results in the AER's benchmarking will reflect both differences in efficiency and differences in exogenous factors, with no assessment of the contribution of each. In other words, the AER's benchmarking suffers from the difficulty identified by the Productivity Commission that comparisons must take into account differences in operational circumstances, differences between jurisdictions and policy constraints, which is noted in the list of difficulties cited on page 21.

Elsewhere in its economic benchmarking report, the AER appears to have acknowledged this limitation of its benchmarking:

> Because we do not draw conclusions on the relative productivity levels of the transmission networks, we have not formed a view on how environmental factors may affect those relative positions.[38]

However, the AER has then contradicted itself by drawing conclusions on the relative productivity levels of transmission networks in its assessment of TransGrid's capital expenditure, as noted above.[39] TransGrid considers that the AER's use of its MTFP benchmarking as part of its top down assessment of capital expenditure is inappropriate and raises questions as to the veracity of the AER's top down assessment.

In relation to the application of benchmarking to the determination of efficient expenditure forecasts, the AEMC was also clear that the individual circumstances of the businesses must be taken into account. It stated that:

> Under the first expenditure criterion the AER is required to accept the forecast if it reasonably reflects the efficient costs of achieving the opex objectives. These include references to the costs to meet demand, comply with applicable obligations, and maintain quality, reliability and security of supply of services and of the system. These necessarily require an assessment of the individual circumstances of the business in meeting these objectives.[40]

As has been shown, the AER has not adequately assessed the individual circumstances of the businesses in its benchmarking. TransGrid remains concerned that the AER's application of benchmarking in the draft decision has inappropriately influenced the forecasts in the draft decision and has materially contributed to the outcome.

The Voltage-Weighted Entry and Exit Connections Output Has Not Been Recorded on a Consistent Basis Between TNSPs

TransGrid has some concerns with the consistency of data used in the voltage-weighted entry and exit connections output. TransGrid understands that there are differences in the way data relating to this output has been defined between TNSPs. For example:

- there are differences in the voltages to which connection points have been referenced, for example, the higher or lower voltages of transformers at a site; and
- there are differences in whether and how interconnectors have been counted.

These differences are likely to be material to the measurement of performance under this measure.

TransGrid also understands that the AER has used a count of transmission node identifiers (TNIs) to represent the number of entry and exit points. TransGrid notes that there may be a

[38] AER, *Electricity Transmission Network Service Providers Annual Benchmarking Report*, November 2014, p16.
[39] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure*, November 2014, p6-19.
[40] AEMC, *Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p107.

wide variation in the capital stock related to each TNI depending on the number and configuration of connections the TNI supplies. In particular:

- the number of connections and therefore amount of capital stock associated with a TNI may vary significantly (for example, some TNIs may supply only one connection whereas others may supply five or more connections);
- the configuration of connections may vary significantly:
  - at some substations the TNSP owns the higher voltage switchbays only (DNSP or direct customer owns transformers and lower voltage switchbays);
  - at other substations the TNSP owns the higher voltage switchbays and the transformers (DNSP owns lower voltage switchbays); and
  - at other substations the TNSP owns the higher voltage switchbays, the transformers and the lower voltage switchbays (DNSP owns from the connections leaving the lower voltage switchbays).

In its annual benchmarking report, the AER stated that:

> …the number of TNIs is the most consistent data that is currently available to us. Further we consider that the summation of TNI voltages is a workable reflection of the number and significance of transmission network connections.[41]

TransGrid does not consider that the summation of TNI voltages is workable reflection of the number and significance of transmission network connections. TransGrid has already advised the AER in its comments on the draft report that there may be a wide variation in the capital stock related to each TNI depending on the number and configuration of connections supplied by the TNI. This may be material to the benchmarking results, potentially disadvantaging TNSPs with larger substations.

TransGrid considers that the number of physical connections would better reflect the number of entry and exit points to the networks.

4.1.2 Partial Productivity Indicators

A partial productivity indicator (PPI) compares the performance of businesses in delivering one type of output. The AER published a number of PPIs in its annual benchmarking report:

- Cost per voltage weighted entry and exit connections
- Cost per circuit line length
- Cost per maximum demand served
- Cost per MVA of connection point capacity

Each PPI is measured with regard to total cost, operating expenditure cost and asset cost (which is an annualised measure of the capital stock used to provide the output).

TransGrid considers that the AER's presentation and discussion of these indicators is generally sensible, and that they do not suffer from the same issues of modelling sensitivity and uncertainty as MTFP. As the AER notes, each PPI only considers the delivery of an individual output, and therefore, a comprehensive range of PPIs need to be considered to provide a complete view of a TNSP's costs.

[41] AER, *Electricity Transmission Network Service Providers Annual Benchmarking Report*, November 2014, p15.

As each PPI only measures costs with reference to one output variable, there is less potential to incorporate exogenous factors into the analysis than with techniques that measure costs with reference to multiple output variables. However, the AER has noted the effects of some exogenous factors qualitatively in the discussion of each PPI in the report, which is a useful starting point.

TransGrid's concerns with the voltage weighted entry and exit connections output set out above in relation to MTFP also apply to its use as a PPI. That is, differences in the way data relating to this output has been defined between TNSPs are likely to be material to the measurement of performance under this PPI.

4.1.3 Use of the Annualised Asset Cost Input Measure

In both the MTFP and PPI benchmarking, the AER has used a measure of annualised asset cost to reflect the cost of assets used to provide transmission services. As the AER states:

> This represents the amount that consumers are paying annually for the total assets of the businesses. The asset cost is made up of the annual allowances that the transmission networks receive to cover depreciation (return of capital) and the return on investment into their assets (return on capital).[42]

TransGrid considers that the asset cost input measure is appropriate in quantifying the cost of providing transmission services relating to the use of assets.

However, TransGrid has concerns with the extent to which a measure of existing capital stock is useful in assessing forecast capital expenditure.

Annualised asset cost is used as the input measure relating to capital inputs because it reflects the total quantity (in an economic sense) of the assets being used to provide transmission services. It is used in preference to annual capital expenditure because capital expenditure can be highly variable over time, and does not reflect the complete value of capital used to provide transmission services.

While the use of annualised asset cost to develop historical trends may provide some informative observations, TransGrid considers that it is not an appropriate measure to use to assess forecast capital expenditure.

The annualised asset cost comprises costs for both existing capital, that is, the depreciated value of existing assets, and new capital added at points in time, that is, the value of capital expenditure. By far the larger of these two values is existing capital stock, which is to be expected for a mature network in which network augmentations and equipment replacement comprise a small proportion of the size of the existing network.

Therefore, the historical measurement of asset cost would primarily measure the historical investment decisions a TNSP has made over the last 40 to 50 years (albeit with the earlier years given less weight due to the use of a depreciated value). TransGrid considers that a TNSP's historical investment decisions, particularly over a long period of time and reflecting different stages in the development of the network and different points in investment cycles, are largely irrelevant to the assessment of current investment decisions at the TNSP's current point in an investment cycle.

TransGrid considers that the assessment of current investment decisions, reflected in forecast capital expenditure, is best undertaken with reference to the current needs of the

[42] AER, *Electricity Transmission Network Service Providers Annual Benchmarking Report*, November 2014, p33.

network and efficient cost estimates. The current needs of the network are those required to satisfy the capital expenditure objectives in the National Electricity Rules, which are to:

1. Meet or manage the expected demand for prescribed transmission services over that period
2. Comply with all applicable regulatory obligations or requirements associated with the provision of prescribed transmission services
3. 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
4. Maintain the safety of the transmission system through the supply of prescribed transmission services.[43]

The efficient current cost estimates used in forecasting capital expenditure reflect the most up-to-date costs for which a TNSP can employ capital.

For a service as complex as the provision of electricity transmission services, TransGrid considers that a technical review of individual investment needs and cost estimates is the most relevant assessment approach to the efficiency of a TNSP's forecast capital expenditure.

4.2 Operating Expenditure Partial Factor Productivity

In the draft decision, the AER has relied on further benchmarking work that attempts to quantify operating expenditure partial factor productivity (PFP). This work is based on the same model and data set as the MTFP in the annual benchmarking report, and therefore many of the shortcomings TransGrid has identified in relation to the AER's MTFP benchmarking also apply to operating expenditure PFP benchmarking.

That is:

1. the output specification used for the MTFP does not align with the capital or operating expenditure objectives in the National Electricity Rules, and therefore with the cost drivers of TNSPs;
2. the MTFP model has a high degree of uncertainty and demonstrates significant sensitivity to changes in the model specification or source data;
3. the results of the MTFP model are consistent with a bias toward smaller TNSPs;
4. the AER has not adequately considered exogenous factors that are characteristic of different operating environments and therefore influence cost drivers between TNSPs; and
5. the voltage-weighted entry and exit connections output has not been recorded on a consistent basis between TNSPs.

[43] *National Electricity Rules*, Clause 6A.6.7(a).

HoustonKemp examined the AER's operating expenditure PFP benchmarking in its expert advice on benchmarking.[44] HoustonKemp identified three principal shortcomings with the AER's approach to forecasting the rate of change of operating expenditure:

- the forecasts depend on the same output weights underpinning the MTFP analysis, and so are not robust;
- the resultant opex forecasts are themselves not robust; and
- the forecasts of the productivity growth rate do not properly account for step changes.[45]

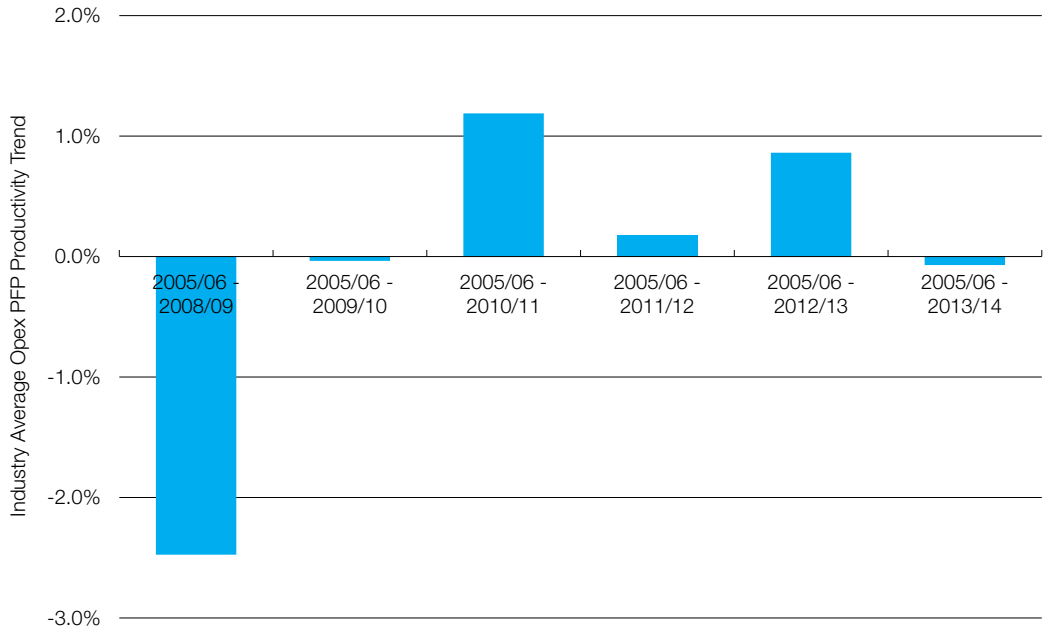
HoustonKemp found that:

> It follows that the AER's estimates of the rate of change of opex are compromised, and so are not appropriate as a basis for setting TransGrid's opex allowance.
>
> Finally, we note that the AER's treatment of step-changes is predicated on the assumption that historical step changes are a sensible proxy for future step changes. In our opinion, they are not. The AER has ignored the specific information provided by TransGrid in relation to step changes and has instead relied on an estimate derived from a model that is compromised. In our opinion this approach does not represent regulatory best practice.[46]

The report providing HoustonKemp's assessment and findings is attached as Appendix C.

To illustrate the level of variability inherent in the operating expenditure PFP, TransGrid has compared the industry operating expenditure PFP over different time periods, as shown in Figure 4.1.

Figure 4.1
Variability of Operating Expenditure PFP Over Different Time Periods



Source: TransGrid.

[44] HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014, pp16-22.
[45] HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014, pp1-2.
[46] HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014, p2.

As is evident, the industry average annual operating expenditure PFP productivity trend varies between –2.47% and +1.19% depending on the time period chosen. As applied to TransGrid's operating expenditure, together with the differences in output weights, this could result in a variance of between approximately +58 million and –$9 million over 2014/15 to 2017/18 – which is a material variance.[47]

This clearly demonstrates the sensitivity and uncertainty inherent in the AER's PFP model, which HoustonKemp considers renders it not fit for purpose for use in a revenue determination.

4.3 Conclusion

For the reasons set out in this chapter, TransGrid does not consider the AER's MTFP benchmarking or operating expenditure PFP benchmarking to be fit for purpose for use in a revenue determination.

TransGrid notes that both the AEMC and Productivity Commission have expressed openness to ascertain whether high level economic benchmarking techniques such as TFP are feasible for electricity transmission in Australia. As the AEMC stated:

> … there is a question as to whether the AER should assess the suitability of a TFP methodology against the specified conditions in relation to the transmission sectors. At this stage we consider there is merit in allowing the AER to conduct such testing based on the transmission data. Our conclusion about the suitability of TFP for the transmission sector is based upon current understanding and not based upon empirical testing. Therefore the analysis would benefit from allowing these issues to be tested more fully.[48]

The Productivity Commission suggested that although benchmarking is not yet sufficiently reliable and robust to directly set regulated revenue allowances:

> If its rigour and accuracy improves, aggregate benchmarking could also encourage early settlement in determinations, short-circuiting the current costly processes.[49]

TransGrid acknowledges that the AER has commenced data gathering and the development of high level economic benchmarking techniques for electricity transmission. TransGrid has supported, and will continue to support, the AER in the development of appropriate benchmarking methodologies over time. However, TransGrid considers that the AER should adopt a more measured approach in the context of uncertainty as to whether these techniques are, in fact, feasible for electricity transmission in Australia. Further, TransGrid considers that these techniques should be given limited weight in the AER's analysis, given concerns over their robustness.

In the interim, the Productivity Commission provided some clear cautions on the use of benchmarking before it is fully developed:

---

[47] The trend including 2013/14 has been developed using data from the 2013/14 regulatory information notices. However, some data used in the benchmarking models is not collected through the regulatory information notice process. In these cases, TransGrid has made reasonable assumptions for the purpose of preparing an estimate of the 2013/14 trend:

- operational data for Victoria that AusNet Services was not required to provide in its RIN was assumed to be the same as in 2012/13;
- energy not supplied was not required to be provided in the RINs, and was assumed to be the average over 2005/06 to 2012/13 (excluding an unusual result in 2008/09 for AusNet Services); and
- the capital goods price index (CGPI) was estimated by extrapolation.

[48] AEMC, *Final Report: Review into the Use of Total Factor Productivity for the Determination of Prices and Revenues*, 30 June 2011, p33.

[49] Productivity Commission, *Electricity Network Regulatory Frameworks: Productivity Commission Inquiry Report: Volume 1*, 9 April 2013, p30.

> Any use by the AER of benchmarking to estimate values for opex and capex allowances in determining regulated revenue allowances should be accompanied by two protections of the long-run interests of consumers.
>
> First, the AER should use detailed publication and peer review to help demonstrate that the benchmarking results are robust enough to serve that purpose.
>
> Second, in making any judgments about allowable revenues, the AER should choose a yardstick more akin to that applying in competitive markets — which would be a firm close to, but not at the efficiency frontier. The current requirement under the Rules that the AER must accept a 'reasonable' proposal appears to be consistent with this standard for gauging efficiency. Using such a standard recognises that the likelihood of error in trying to estimate the perfectly efficient level of costs is (exactly) 100 per cent. Under incentive regulation, under-remuneration is likely, ultimately, to lead to larger costs than over-remuneration of an equal magnitude. This is because the costs of underinvestment affect the long-run provision of reliable network services to consumers. In contrast, if the incentive regime were performing its role, any over-remuneration would not lead to over-investment by a well-governed, profit-motivated network company. Rather it would result in slightly larger profits (which have lower efficiency costs), which the regulator could reduce in subsequent regulatory periods.
>
> This suggests there should be the retention of some bias towards encouraging investment, but not too large a one.[50]

TransGrid is disappointed that despite attempts by the industry to engage with the AER throughout the development of its benchmarking, the AER has generally declined engagement with the industry. Where the industry has provided comments, such as through submissions on the draft annual benchmarking report, many of the comments have not been taken into account. TransGrid would encourage the AER to be more open and collaborative in the development of its benchmarking.

TransGrid also understands that robust benchmarking takes time to develop and that the initial attempts at data collection and benchmarking will generally not produce robust or reliable results. TransGrid also considers it important that the AER acknowledge that complex techniques such as MTFP may never be proven feasible for application to electricity transmission networks in Australia. If, in fact, this is the case, it would be prudent for the AER to ascertain that early in the development of the techniques so as to minimise the regulatory burden on all parties involved in the regulatory process.

[50] Productivity Commission, *Electricity Network Regulatory Frameworks: Productivity Commission Inquiry Report: Volume 1*, 9 April 2013, p31.

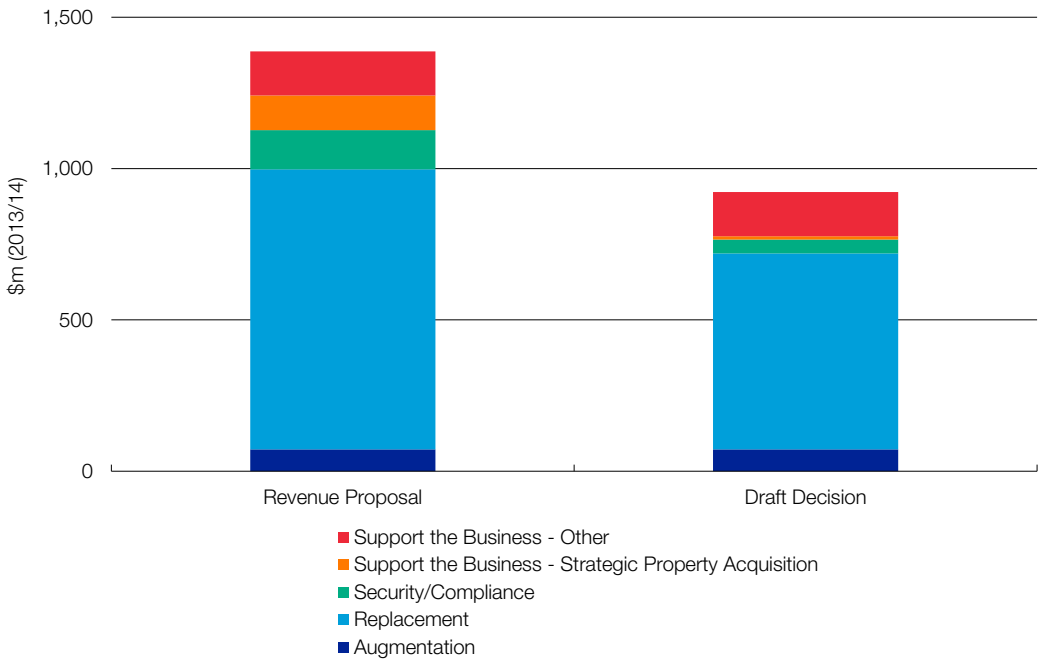
5 Capital Expenditure

Capital expenditure is expenditure on the infrastructure and assets that provide transmission services. These include new assets that increase capacity on the network, replacement of existing assets that are reaching the end of their serviceable lives and minor assets such as information technology and vehicles.

In the revenue proposal, TransGrid proposed total forecast capital expenditure of $1,387.4 million for 2014/15 to 2017/18. In the draft decision, the AER substituted total forecast capital expenditure of $922.3 million for 2014/15 to 2017/18.

The difference between the revenue proposal and draft decision is shown in Figure 5.1.

Figure 5.1
Comparison of Capital Expenditure Forecasts ($m 2013/14)



Source: TransGrid and AER.

TransGrid does not consider that the allowance in the draft decision would allow it to recover the efficient costs of meeting the capital expenditure objectives.[51]

Because the AER has not accepted the capital expenditure proposed by TransGrid, it is required to set out an estimate of capital expenditure it is satisfied reasonably reflects the capital expenditure criteria, taking into account the capital expenditure factors.[52]

That is, the capital expenditure forecast must reasonably reflect:

1. The efficient costs of achieving the capital expenditure objectives
2. The costs that a prudent operator would require to achieve the capital expenditure objectives
3. A realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objectives.[53]

TransGrid does not consider that the AER's capital expenditure forecast in the draft decision reasonably reflects the capital expenditure criteria. TransGrid considers that the AER's capital expenditure forecast understates the efficient costs of achieving the capital expenditure objectives because:

- the review of replacement expenditure undertaken by EMCa, on which the AER has relied to reduce replacement expenditure, lacks analysis and sound reasoning;
- the rationale provided by the AER to reduce security/compliance expenditure is unsound; and
- despite justifying reductions in expenditure on the basis that TransGrid had not provided a top-down assessment, the AER has failed to provide an adequate top-down assessment to justify its substitute forecast.

In this chapter and Appendices E to G, TransGrid provides detailed evidence to demonstrate that the AER's position is not in the long term interests of consumers.

In November 2014, TransGrid achieved full certification to ISO 55001 following a comprehensive audit of its governance, asset management and decision making processes. This demonstrates the suitability of TransGrid's asset management approach with reference to an internationally recognised standard.

TransGrid also engaged Asset Management Consulting Limited (AMCL), global asset management experts, to review EMCa's report to the AER on replacement expenditure. AMCL found that in EMCa's report:

- there is a disconnect between the observations made and conclusions drawn;
- there is a lack of evidence and analysis to justify the proposed percentage reductions in funding;
- EMCa appears to apply distribution-focused management strategies that are generally unsuitable to TransGrid's transmission business and assets; and
- there is a misunderstanding of TransGrid's application of its risk assessment processes.

[51] The capital expenditure objectives are set out in Clause 6A.6.7(a) and in summary are to meet or manage expected demand, comply with regulatory obligations and maintain quality, reliability, security and safety.
[52] *National Electricity Rules*, Clause 6A.14.1(2)(ii).
[53] *National Electricity Rules*, Clause 6A.6.7(c).

In this revised revenue proposal, TransGrid has set out the forecast capital expenditure it considers is required to achieve the capital expenditure objectives in the 2014/15 to 2017/18 period. The total forecast capital expenditure is $1,346.9 million. The forecast capital expenditure is shown in Table 5.1.

Table 5.1
Revised Forecast Capital Expenditure ($m nominal)

Category	2014/15 Expected	2015/16 Forecast	2016/17 Forecast	2017/18 Forecast
Augmentation	23.2	7.7	25.6	22.9
Replacement	252.7	268.8	224.9	206.8
Security/Compliance	31.5	24.8	31.9	51.2
Support the Business	**43.7**	**110.4**	**51.5**	**53.1**
Information Technology	19.8	20.7	19.5	23.0
Accommodation	8.8	11.5	5.2	0.0
Vehicles	9.2	8.1	10.0	11.7
Strategic Property	3.2	68.6	15.2	17.1
Other Business Support	2.6	1.5	1.6	1.3
Total	**351.0**	**411.7**	**333.9**	**334.0**

Source: TransGrid. Totals may not add due to rounding.

As the cost of capital investments is recovered over the life of the investments, the cost to consumers of the $1.4 billion of forecast capital expenditure in the 2014/15 to 2017/18 period will be approximately $249 million within the period.[54] The net impact of these capital investments on the regulatory asset base results in an average increase of approximately $6.40 per year for an average residential consumer.

5.1 Summary of Revenue Proposal

Chapter 5 of TransGrid's revenue proposal set out the methodology, key inputs and assumptions used to determine the capital expenditure forecast for the next regulatory control period.

Forecast capital expenditure is significantly different from any period in recent history for TransGrid.

Augmentation expenditure has decreased to less than 10% of the level in the previous regulatory control period, reflecting the recent moderation in electricity usage. The small amount of augmentation expenditure forecast for 2014/15 to 2017/18 is in specific areas, driven by local developments such as mining and housing developments.

Replacement expenditure has increased by about 40% from that of the previous regulatory control period, reflecting condition risks of assets that are reaching the end of their serviceable lives.

[54] The cost to consumers of capital investment is the return on capital and regulatory depreciation, which are recovered over the life of the assets.

Security/compliance expenditure has increased significantly due to the need to remediate low spans on transmission lines. This need was identified following the measurement of transmission line conductor heights using new accurate techniques since the submission of the 2009/10 to 2013/14 revenue proposal. TransGrid has already undertaken remedial work to address the highest priority transmission lines, and is seeking to address the next priority lines in the 2014/15 to 2017/18 period.

Expenditure to support the business is forecast to continue at around the same level as previously.

As inputs to the costing of projects, TransGrid proposed to use its employee agreement for labour for committed projects and external forecasts of labour escalation, provided by BIS Shrapnel, for future projects. TransGrid proposed to apply commodity and property escalation to future projects, to reflect input cost increases between the time of the estimate and the time of delivery of the project.

TransGrid also proposed two contingent projects:

- a network solution to the Powering Sydney's Future project to supply the Sydney central business district (CBD) and inner metropolitan area, should it be required; and
- reinforcement of capacity in Southern New South Wales.

At TransGrid's consumer engagement workshops, large energy users raised concerns that demand forecasts may be optimistic and may not sufficiently take into account the challenges facing the manufacturing sector at the present time. In response, TransGrid assessed its capital portfolio, including replacement capital expenditure, against a scenario of falling peak demand. The review indicated that TransGrid's capital portfolio is the most appropriate across a range of scenarios, including slight to moderate falling peak demand. TransGrid has already reduced the capacity at key locations where demand has decreased significantly, for example, due to the closure of an aluminium smelter at Kurri Kurri.

5.2 Summary of Draft Decision

In the draft decision, the AER accepted TransGrid's forecast expenditure for augmentation (including connections) and to support the business (other than strategic property acquisition). It indicated that it will consider the effect of the 2014 demand forecasts on augmentation in its final decision.

The AER rejected TransGrid's forecast expenditure for replacement, security/compliance and strategic property acquisitions. It substituted alternative forecasts of expenditure for these categories. The AER expressed concerns that:

- TransGrid used a bottom-up build up of forecast expenditure, and did not apply a top-down assessment;
- the risk assessments used to justify replacement and security/compliance capital expenditure appeared conservative;
- there is a degree of potential inaccuracy in forecasts of commodity escalation; and
- in the AER's view, TransGrid's capital efficiency has been declining over time and is lower than some other transmission networks.

The AER reviewed TransGrid's proposed strategic property acquisitions. Of the seven strategic property acquisitions proposed:

- one was settled in 2013/14, and therefore no longer requires expenditure in the 2014/15 to 2018/19 period;
- the AER accepted two acquisitions, one at Beryl and one for easements in the Australian Capital Territory (ACT); and
- the AER rejected the remaining four acquisitions for Powering Sydney's Future, Surry Hills, Maraylya and Richmond Vale.

The AER considered TransGrid's unit costs to be reasonable.

With respect to contingent projects, the AER rejected the network solution for the Powering Sydney's Future project on the basis that demand forecasts had further moderated since the submission of TransGrid's revenue proposal, and this is unlikely to be required in the upcoming period. It proposed some amendments to the trigger for the reinforcement of capacity in Southern New South Wales.

5.3 Response to Draft Decision

TransGrid accepts the draft decision on expenditure for augmentation (including connections) and to support the business (other than strategic property acquisition). TransGrid has considered the effect of the 2014 demand forecasts on augmentation, and found that the timing of one connection project has changed based on the new forecasts. TransGrid has deferred the expenditure for this project in this revised proposal.

TransGrid advised the AER during its review of the revenue proposal that the Powering Sydney's Future contingent project was no longer required, following early advice on the 2014 demand forecasts. TransGrid has amended the trigger of the contingent project for reinforcement of capacity in Southern New South Wales to take account of the matters raised in the draft decision.

TransGrid rejects the AER's findings and substitute forecast expenditure for replacement and security/compliance expenditure because:

- the absence of a top-down assessment does not mean that a top-down assessment would result in a reduction in expenditure. Indeed, the top-down assessment applied by the AER does not justify the AER's proposed reductions to expenditure because:
  - the AER's economic benchmarking, by its own admission, is not fit for the purpose for which the AER has used it;
  - the AER's trend analysis is based on inappropriate assumptions and does not lead to credible conclusions; and
  - the review of replacement expenditure undertaken by EMCa, on which the AER has relied, lacks analysis and sound reasoning;
- an appropriate top-down assessment that has regard to all the information available to the AER supports the forecast replacement expenditure TransGrid had proposed; and
- a sensitivity analysis of TransGrid's risk assessments demonstrates that even if the issues of concern to the AER are addressed, all projects in TransGrid's proposed portfolio are still required.

The AER engaged a consultant, EMCa, to review TransGrid's forecast replacement expenditure.

TransGrid has reviewed EMCa's report and considers that, while some of EMCa's observations are fair, others reflect errors of fact and insufficient regard to the information TransGrid provided to the AER accompanying the revenue proposal. Further, EMCa has selectively referenced the information available to it and drawn inferences in the absence of information in a way that does not provide a balanced view. Finally, the observations made by EMCa do not support its conclusions, and EMCa has also not provided any analysis to support its conclusions.

TransGrid engaged AMCL, global asset management experts, to review EMCa's report to the AER on replacement expenditure. AMCL found that in EMCa's report:

- there is a disconnect between the observations made and conclusions drawn;
- there is a lack of evidence and analysis to justify the proposed percentage reductions in funding;
- EMCa appears to apply distribution-focused management strategies that are generally unsuitable to TransGrid's transmission business and assets; and
- there is a misunderstanding of TransGrid's application of its risk assessment processes.

The review by AMCL is attached as Appendix E.

TransGrid has also provided a comprehensive response to the specific claims made in the EMCa report, setting out the reasons why the review process was inadequate and why TransGrid considers EMCa's conclusions to be invalid. The response is attached as Appendix F.

TransGrid considers that the AER's concerns regarding commodity escalation do not preclude its use in forecasting. However, the evidentiary burden the AER would require to alleviate its concerns is sufficiently high that it has proven infeasible to address in the time TransGrid has had to prepare this revised proposal. Therefore, TransGrid accepts the AER's proposal to use CPI in lieu of commodity escalation in this revised proposal, noting that the impact is not material. However, TransGrid does not consider in principle that CPI provides the best forecast of commodity escalation.

TransGrid accepts the AER's acceptance of strategic property acquisitions at Beryl and for easements in the ACT. However, it considers that the four strategic acquisitions rejected by the AER are prudent and has included them in the forecasts in this revised proposal, with additional information to substantiate their inclusion.

A summary of the matters raised in the AER's draft decision and TransGrid's responses are shown in Table 5.2.

Table 5.2
Summary of Matters Addressed in Revised Proposal

Matter	AER Draft Decision	TransGrid Response
Demand forecasts	Will update augmentation expenditure (including connections) to take into account 2014 demand forecasts in final decision	Updated forecast augmentation expenditure for 2014 demand forecasts The timing of one connection project has changed based on the new forecasts
Top-down assessment	The AER has developed a top-down assessment, which it has applied to TransGrid's forecast expenditure for replacement and security/compliance	As demonstrated by HoustonKemp, the AER's top-down assessment is unreasonable TransGrid has provided an alternative top-down assessment
Risk assessment	Suggested that TransGrid's risk assessment method appears conservative	When changes are made to the risk assessment method as suggested by EMCa, there is no change to the capital program requirements EMCa has incorrectly assessed the sensitivity of the capital program to the value of risk
Low span remediation	Reduced expenditure for low spans on basis that TransGrid does not have a history of incidents caused by low spans	There are unacceptable safety and environmental risks that are required to be addressed by low span remediation
Strategic property acquisition	Accepted two strategic property acquisitions and rejected four	All strategic property acquisitions are prudent Re-instated the four property acquisitions rejected by the AER
Cost escalation	For labour, used average of forecasts from BIS Shrapnel and Deloitte Access Economics Rejected commodity escalation due to concerns about accuracy, and substituted CPI Accepted property escalation	Accept the AER's labour escalation methodology Updated escalators to incorporate most recent forecasts from BIS Shrapnel Accept CPI for commodity escalation, but do not consider that CPI provides the best forecast of escalation in principle Accept property escalation

Table 5.2
Summary of Matters Addressed in Revised Proposal (cont'd)

Matter	AER Draft Decision	TransGrid Response
Contingent projects	Rejected Powering Sydney's Future due to changes in demand forecast	Advised AER of agreement on Powering Sydney's Future prior to draft decision
	Proposed modifications to trigger for reinforcement of capacity in Southern New South Wales	Amended trigger for reinforcement of capacity in Southern New South Wales to meet AER requirements
Update for actual expenditure in 2013/14	The AER has indicated it will update the RAB for 2013/14 actual expenditure	TransGrid has updated its forecast capital expenditure to include a small amount of expenditure in 2014/15 that was not incurred in 2013/14

5.4 Augmentation

In the draft decision, the AER accepted TransGrid's augmentation expenditure (including connections). The AER noted that TransGrid's proposed augmentation expenditure aligns with an assessment of augmentation needs in New South Wales undertaken by the Australian Energy Market Operator (AEMO).

In the draft decision, the AER noted that it would consider the impact of updated connection point demand forecasts in the final decision.

TransGrid has reviewed its augmentation projects (including connections) following the release of the 2014 connection point demand forecasts. TransGrid identified a change in timing of one connection project, at Beryl substation, from 2015 to 2016 based on the revised forecasts. TransGrid has deferred the expenditure for this project in this revised proposal.

TransGrid's forecast augmentation expenditure and average annual impact on a typical residential consumer bill are shown in Table 5.3.

Table 5.3
Forecast of Augmentation Expenditure ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	23.2	7.7	25.6	22.9
Average annual impact on typical residential bill	Increase of 35 cents per year			

Source: TransGrid.

5.5 Replacement

In the draft decision, the AER reviewed TransGrid's forecasting methodology for capital expenditure. The AER did not consider TransGrid's forecasting methodology as sufficient to demonstrate that the proposed total forecast capital expenditure reasonably reflects the capital expenditure criteria, because:

- TransGrid used a bottom-up build up of forecast expenditure based on asset condition, and did not apply a top-down assessment; and
- the AER considers TransGrid's risk assessment methodology to be conservative.

In the draft decision, the AER assessed TransGrid's replacement expenditure using several assessment techniques:

- economic benchmarking;
- trend analysis; and
- engineering review, including:
  - a review of TransGrid's governance and management framework;
  - a review of TransGrid's forecasting methods; and
  - reviews of a sample of projects.

TransGrid considers that the AER's application of each of these techniques is not sound, and that the AER's conclusions and substitute replacement forecast are not in the long term interests of consumers. The rationale for TransGrid's view is set out below and in the supporting detail in Appendices E to G.

TransGrid's forecast replacement expenditure and average annual impact on a typical residential consumer bill are shown in Table 5.4.

Table 5.4
Forecast of Replacement Expenditure ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	252.7	268.8	224.9	206.8
Average annual impact on typical residential bill	Increase of $4.26 per year			

Source: TransGrid.

5.5.1 Economic Benchmarking

The AER has used economic benchmarking, specifically the MTFP benchmarking published in its annual benchmarking report, to inform its assessment of TransGrid's forecast capital expenditure. In its assessment, the AER draws some conclusions from this economic benchmarking:

> Generally, these results show that, while TransGrid is proposing lower capex than its historical average, its overall expenditure efficiency is materially lower than that achieved by TasNetworks and ElectraNet. More importantly, its capital efficiency has been steadily declining over time. These observations suggest that there is the potential for efficiencies to be found in TransGrid's proposed forecast capex.
>
> …
>
> These results show that TransGrid's efficiency is low and has been declined steadily over time.[55]

[55] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure*, November 2014, p6-29.

However, the AER then casts doubt on the veracity of its own benchmarking:

> As noted in the report, it is difficult to draw any firm conclusions regarding the relative efficiency of the transmission networks based upon the benchmarking results. This is because the relative efficiency of the networks change depending on the measure selected, the limited number of TNSPs and the relative infancy of economic benchmarking in relation to MTFP. [56]

TransGrid considers that the AER's doubt on the veracity of its own benchmarking is entirely justified, and that the conclusions the AER has drawn from this benchmarking are invalid. As the relative efficiency of the transmission networks change depending on the measure selected, and MTFP benchmarking is in its infancy, the benchmarking is not fit for purpose to draw conclusions on either the relative efficiency of TNSPs or the trend over time.

Therefore, TransGrid considers that the AER's benchmarking is not fit for use in a revenue determination and that conclusions drawn from the benchmarking are not valid.

In place of the use of MTFP benchmarking, TransGrid has proposed alternative benchmarks in Section 5.5.2 that are more robust and more suitable as top-down metrics by which to assess TransGrid's forecast capital expenditure.

5.5.2 Trend Analysis

The AER has also used trend analysis to compare TransGrid's forecast capital expenditure in 2014/15 to 2018/19 with historical capital expenditure in 2004/05 to 2013/14. TransGrid considers that the AER's approach to trend analysis is based on inappropriate assumptions, and therefore does not lead to credible conclusions.

The AER's trend analysis relies on three assumptions, each of which the AER has not demonstrated are reasonable:

1. past expenditure levels are a reasonable predictor of future levels;
2. stable trends in lagging performance indicators indicate that an increase in replacement expenditure is not required; and
3. replacement and augmentation expenditure are not substitutable.

Past Expenditure Levels as a Predictor of Future Expenditure Levels

The AER has developed its trend analysis on the premise that past expenditure levels are a reasonable predictor of future levels. In the draft decision it observes a difference in historical and forecast average annual expenditure and uses this observation to draw conclusions about the suitability of TransGrid's forecast expenditure. Further, in recommending the substitute forecasts adopted by the AER, EMCa based some of their forecasts on historical levels of expenditure.[57]

The use of past expenditure levels as a predictor of future levels would be suitable for categories of expenditure that are reasonably recurrent or consistent over time. However, TransGrid does not consider this is the case for its replacement expenditure.

For past replacement expenditure levels to be a reasonable predictor of future levels, two conditions would need to be satisfied:

- the existing network was developed at a reasonably consistent rate over time; and

[56] AER, Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure, November 2014, p6-29.
[57] EMCa, *Review of Proposed Replacement Capex in TransGrid Revenue Proposal 2014-2019*, October 2014, pp28,33.

- network assets reach the end of their serviceable lives at a consistent or evenly distributed rate.

At the very least, these two conditions would need to interact in such a way that produced a net consistent replacement forecast over time.

TransGrid does not consider that these conditions are satisfied for its transmission network in New South Wales and the Australian Capital Territory. As explained in the revenue proposal, to date TransGrid has mainly undertaken replacement and refurbishment of individual items of equipment to keep existing substations operational at the lowest cost. However, when the majority of equipment in a substation reaches the end of its serviceable life or the majority of structures on a transmission line reach the end of their serviceable lives at around the same time, a complete rebuild can be a more prudent and economic option.

TransGrid is now seeing substations and transmission lines constructed in the 1950s and 1960s reaching a condition that reflects the end of their serviceable lives. Given the significant number of assets constructed when the transmission network was first developed, this has led to a material increase in the number of assets requiring replacement over the 2014/15 to 2017/18 period.

Similarly to other network service providers worldwide, TransGrid is also experiencing generational change in substation protection, metering and control systems that is decreasing the expected lives of these assets and increasing the level of replacement required. While older electromechanical systems installed 40-60 years ago had a service life of 40 years or more, modern microprocessor based systems have an expected service life of around 15 years, as with most computer-based devices.

TransGrid notes that the AER itself has recognised that replacement expenditure is not always recurrent.

> A significant proportion of transmission expenditure is typically lumpy in nature. We have therefore not relied on predictive modelling for this review of repex.[58]

TransGrid agrees with this recognition by the AER, and considers that at its stage of the current investment cycle, past expenditure levels are not a reasonable predictor of future levels.

TransGrid considers that instead of the AER's approach to trend analysis, a more appropriate approach is to consider trends in:

- the level of asset-related risk; and
- levels of replacement expenditure over the long term and in the context of investment cycles.

Consideration of the trend in the level of asset-related risk is essential to ensuring forecast capital expenditure meets the capital expenditure objectives in the National Electricity Rules. In particular, the capital expenditure objectives require TNSPs, in the absence of applicable regulatory obligations and requirements otherwise, to:

3. (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

[58] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure*, November 2014, p6-29.

4. Maintain the safety of the transmission system through the supply of prescribed transmission services.[59]

The obligation to maintain quality, reliability, security and safety implies a requirement to maintain asset-related risk at a consistent level.

TransGrid quantifies asset-related risk by assessing the likelihoods and consequences of five categories of risks:

- safety;
- environmental;
- reliability;
- cost; and
- operational.

For the 2009/10 to 2013/14 revenue proposal, TransGrid assigned a score to each category of risk and summated these into an overall score for each need. TransGrid has now developed its risk assessment process further and quantifies risk using dollar values.

However, the assessment of likelihood and consequence is common to the two approaches. Therefore, it is possible to compare the relative levels of risk addressed by the capital portfolio in each period, using the approach taken for 2009/10 to 2013/14 as a common approach.

The levels of risk addressed by the 2009/10 to 2013/14 portfolio and proposed 2014/15 to 2018/19 portfolio are shown on a common scoring basis in Figure 5.2. Importantly, this comparison provides a relative comparison between the two periods, and so the question of bias in the absolute levels of risk is not relevant.

Each point on the axes in Figure 5.2 is the score relating to the pre-investment risk of each need in TransGrid's proposed capital portfolio. Therefore, the spread of points provides an indication of the range of levels of risk addressed by the forecast capital expenditure over each of the periods.

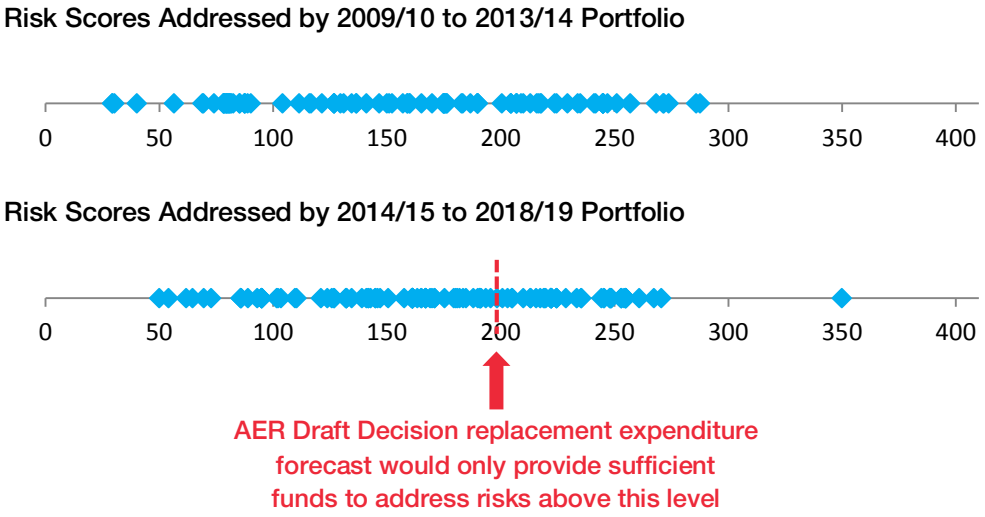
Figure 5.2 shows that the level of risk addressed by the forecast replacement expenditure in TransGrid's revenue proposal is consistent with that addressed by the forecast replacement expenditure in the 2009/10 to 2013/14 revenue proposal, and so addresses the requirement in the capital expenditure objectives to maintain quality, reliability, security and safety.

TransGrid considers that the capital expenditure allowance for the 2009/10 to 2013/14 regulatory control period was appropriate, as evidenced by steady trends in key indicators of network performance over this time.

Conversely, the allowance for replacement expenditure in the AER's draft decision would increase TransGrid's level of asset risk, and would not provide a sufficient expenditure allowance for TransGrid to maintain quality, reliability, security and safety. Therefore, it does not satisfy the capital expenditure objectives.

[59] *National Electricity Rules*, Clause 6A.6.7(a).

Figure 5.2
Relative Trend in Levels of Risk Addressed by Capital Portfolios



Source: TransGrid.

Consideration of the trend in replacement expenditure levels over the long term and in the context of investment cycles is also essential to the sustainability of the transmission network. Without this consideration, the use of past expenditure as a predictor of future expenditure would be highly likely to result in underinvestment or overinvestment. For example, if a TNSP has historically spent below the long term sustainable level of replacement, continued expenditure at this level would result in increased risk and eventually an increase in safety, environmental and reliability issues experienced by consumers. Conversely, if a TNSP has historically spent above the long term sustainable level of replacement, continued expenditure at this level would lead to overinvestment over the long term. In practice, as existing transmission networks have not been developed at consistent rates, the most prudent and efficient replacement expenditure profile is likely to follow investment cycles that reflect the development profile of the network over time.

Over the long term, a sustainable long term average rate of replacement would correspond with the expected asset lives a TNSP can achieve, such that at that rate of replacement the assets will be replaced by the end of their lives. At a high level, this could be approximated as:

$$\textit{Average asset life} = \frac{\textit{Replacement value of assets}}{\textit{Average annual replacement expenditure}}$$

The average asset life implied by the forecast replacement expenditure in TransGrid's revenue proposal over 2014/15 to 2017/18 is:

$$\textit{Average asset life} = \frac{\textit{\$10,290 million}^{60}}{\textit{\$231 million/year}} = 44.5 \textit{ years}$$

This average asset life approximately corresponds with the experience of TransGrid and other TNSPs of average asset lives for transmission equipment of around 40 to 50 years.

[60] TransGrid, *Annual Report 2014*, p152. The figure used is an accounting value, which is lower than the current replacement cost of the network. As such, the implied asset lives calculated using this figure are both likely to be understated.

In contrast, the average asset life implied by the forecast replacement expenditure[61] in the AER's draft decision over 2014/15 to 2017/18 is:

$$\textit{Average asset life} = \frac{\textit{\$10,290 million}}{\textit{\$162 million/year}} = \textit{63.5 years}$$

The average asset life of 63.5 years implied by the AER's draft decision is longer than any transmission network in Australia has been able to achieve. It is also greater than the highest standard asset life of any asset type approved by the AER for any transmission network in the National Electricity Market (NEM). While the AER has accepted TransGrid's standard asset lives (and those of other TNSPs) as reasonable, its assessment of forecast replacement expenditure is significantly inconsistent with the lives it has accepted elsewhere. This places the level of replacement expenditure in the AER's draft decision at an unreasonably low level.

Further, TransGrid's historical replacement expenditure over the last 10 years has also been below a sustainable long term average rate. While this was appropriate, as investment above this level was not required at the time, it does not follow that the historical level of expenditure is necessarily suitable to continue in future periods. Rather, TransGrid considers that the AER's draft decision would perpetuate replacement expenditure below the long term sustainable level of replacement, and likely lead to increased risk and eventually an increase in safety, environmental and reliability issues experienced by consumers.

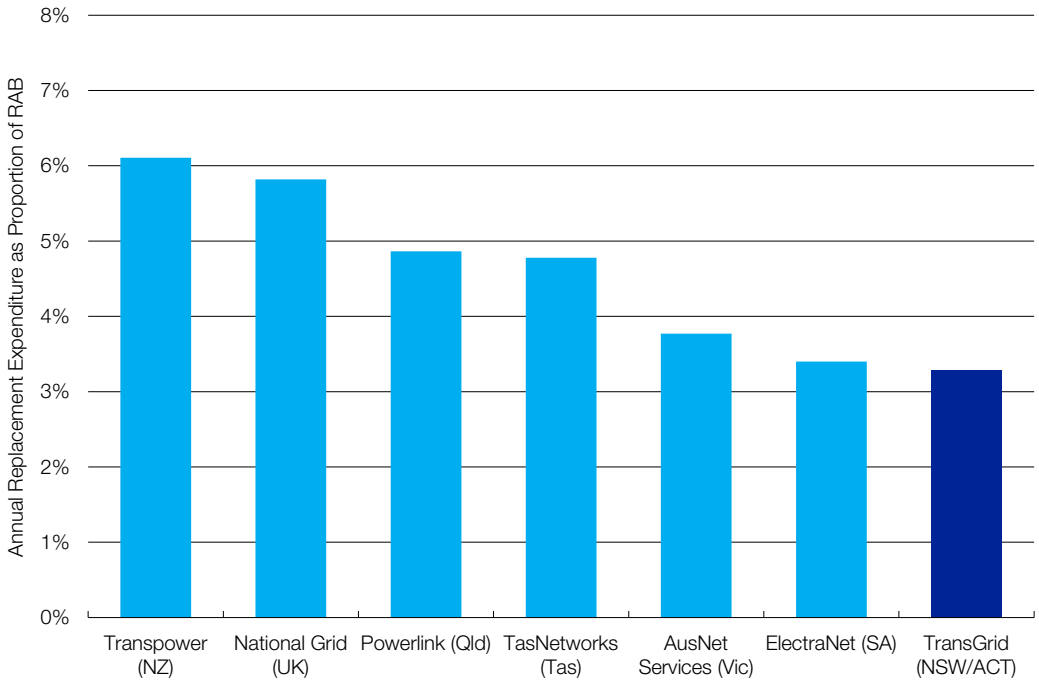
TransGrid has reviewed historical replacement expenditure from the most recent two regulatory control periods for all TNSPs in the NEM and, where available, TNSPs in other countries. The comparison of replacement expenditure as a proportion of Regulatory Asset Base (RAB) is shown in Figures 5.3 and 5.4, and indicates that TransGrid's actual replacement expenditure as a proportion of RAB has been at either the lowest or near lowest amongst its peers in both regulatory control periods.

The data collected through the AER's regulatory information notices (RINs) also supports this observation.

The replacement capital expenditure as a proportion of RAB from data in the AER's category analysis RINs, which include information spanning 2008/09 to 2013/14, is shown in Figures 5.5 and 5.6. Data points below the line, such as TransGrid's, indicate lower than average replacement expenditure as a proportion of RAB. This demonstrates that TransGrid's historical replacement expenditure as a proportion of RAB has been noticeably lower than its peers over 2008/09 to 2013/14.

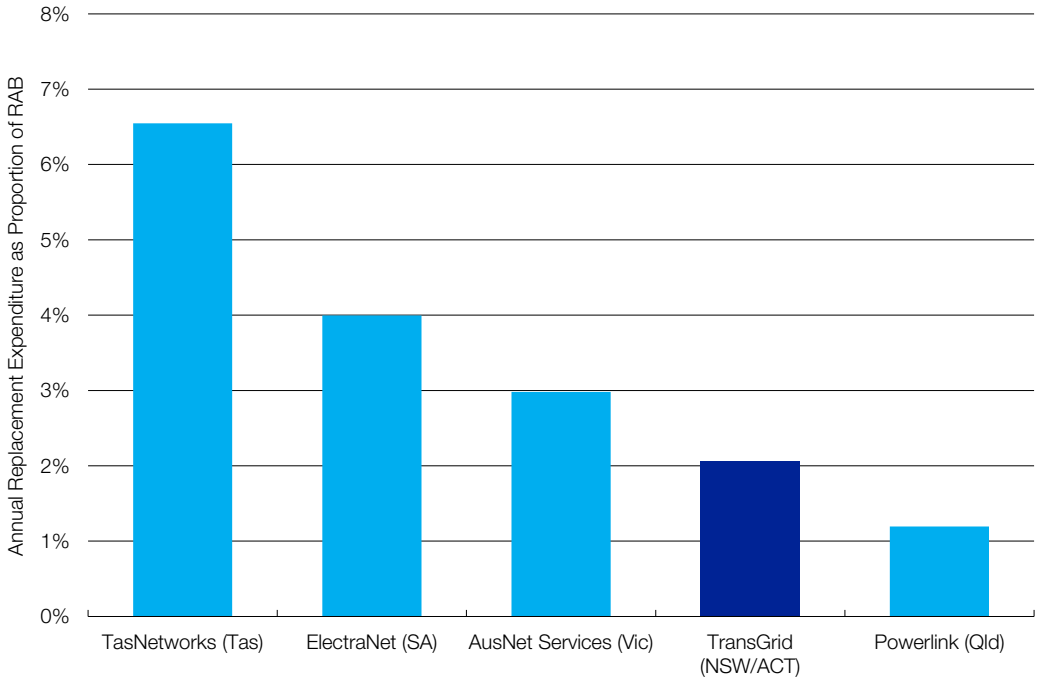
[61] The figures used in this calculation correspond with TransGrid's category of replacement expenditure, which excludes security/compliance expenditure. TransGrid notes that the AER has combined the replacement and security/compliance expenditure categories in its draft decision. However, TransGrid is considering the categories separately as they have different drivers.

Figure 5.3
Replacement Expenditure as Proportion of RAB in Most Recent Historical Period



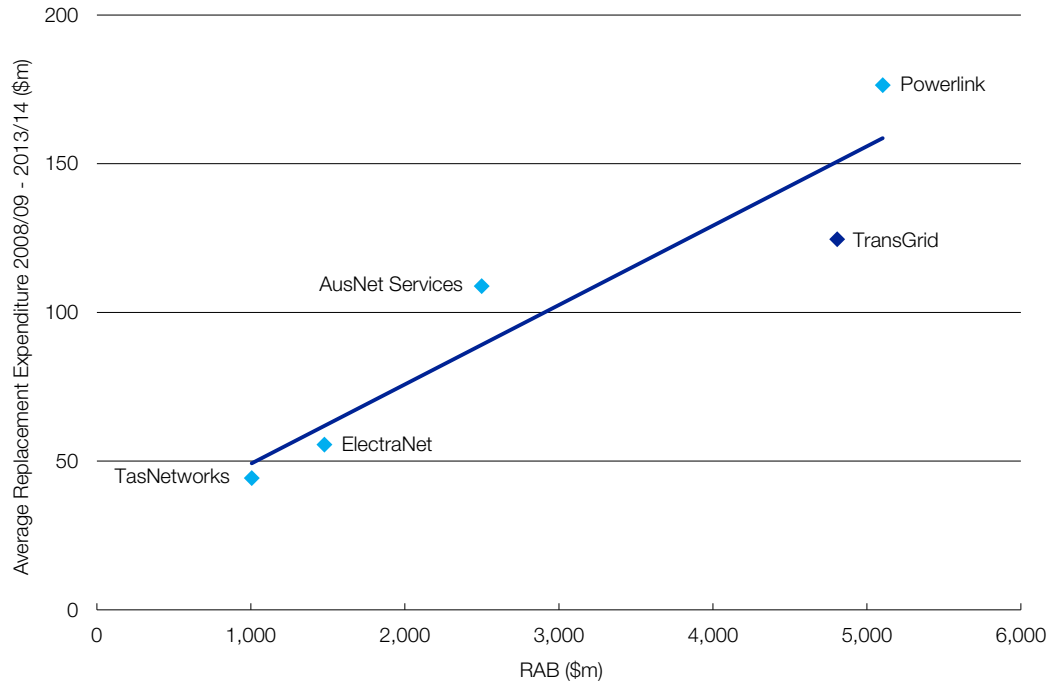
Source: TransGrid.

Figure 5.4
Replacement Expenditure as Proportion of RAB in Second Most Recent Historical Period



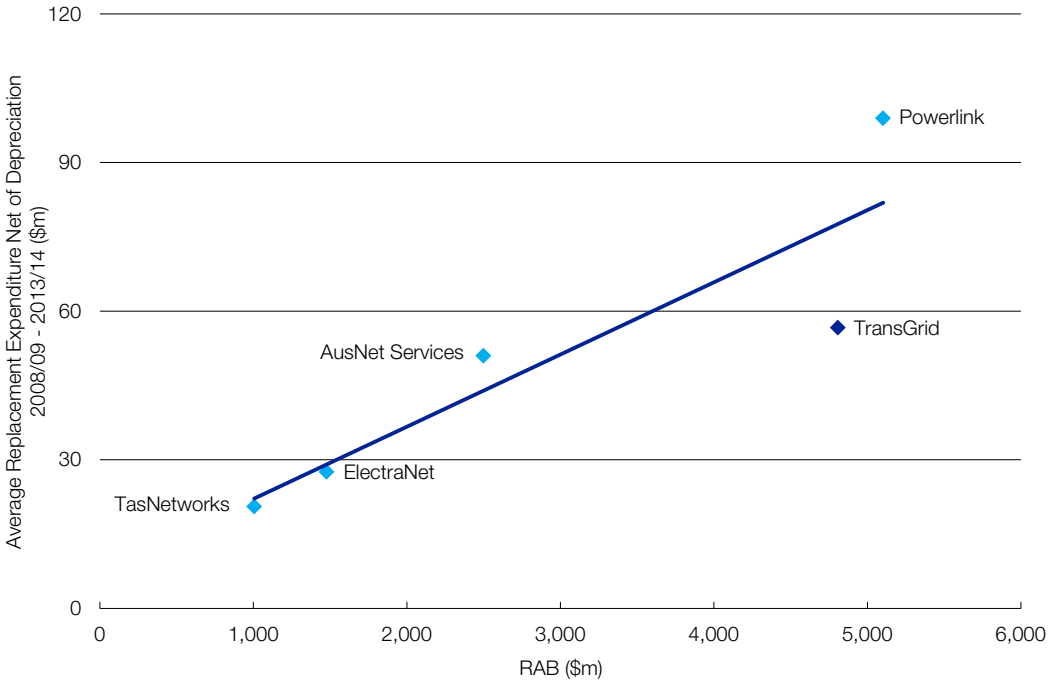
Source: TransGrid.

Figure 5.5
Average Annual Replacement Expenditure Relative to RAB



Source: Category Analysis RIN Data.

Figure 5.6
Average Annual Replacement Expenditure Net of Regulatory Depreciation Relative to RAB



Source: Category Analysis RIN Data.

Therefore, TransGrid considers that an appropriate application of trend analysis considering the level of asset-related risk and replacement expenditure levels over the long term supports the replacement expenditure proposed in its revenue proposal, and indicates that the AER's substitute forecast in the draft decision would be insufficient to satisfy the capital expenditure objectives.

Trends in Performance Indicators

The AER has cited stable or improving trends in performance indicators to conclude that an increase in replacement expenditure is not required.

However, the performance indicators to which the AER refers are lagging performance indicators and the information to which the AER had regard shows them over only a short period of time. TransGrid does not consider that these indicators provide appropriate information to assess forecast replacement expenditure. Rather, they provide information that can help evaluate whether previous replacement expenditure levels have been appropriate.

The indicators to which the AER has referred are:

- number of transmission line outages;
- number of transformer outages;
- number of reactive plant outages; and
- loss of supply events (in system minutes).

TransGrid regularly tracks these indicators to understand the effectiveness of its asset management strategies and plans, ascertain trends of concern in the performance of the network and initiate appropriate actions to address these. As lagging indicators, they are suitable for this purpose. However, they are not used for forecasting expenditure, nor are they suitable for doing so. The appropriate indicators to use for forecasting expenditure are the leading indicators of condition that are referred to in the condition assessments that establish the need for each replacement project. These condition assessments have been provided to the AER as part of the supporting documentation to TransGrid's revenue proposal.

TransGrid does not consider that the AER's use of trends in lagging performance indicators support its conclusion to reduce replacement expenditure.

Substitution Between Replacement and Augmentation

In the draft decision, the AER expressed concern about an increase in TransGrid's replacement expenditure in the 2009/10 to 2013/14 regulatory control period corresponding with a decrease in augmentation expenditure as a result of moderating peak demand.

The AER stated that:

> … the different cost drivers between repex and augex mean that these expenditure categories are not substitutable. Decisions to increase spending on asset replacement in the face of lower demand and a reduced need for augmentation spending need to be made on the basis of specific criteria related to asset condition and risk analysis.[62]

TransGrid agrees that decisions on asset replacement spending need to be made on the basis of specific criteria related to asset condition and risk analysis, and its investment

[62] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure*, November 2014, p6-30.

process does exactly this. However, TransGrid considers that the AER's view that replacement and augmentation expenditure are not substitutable is incorrect.

TransGrid understands that at least one of the personnel of EMCa, the AER's technical consultant, has experience in a different jurisdictional arrangement in which separate bodies are responsible for augmentation and replacement planning. However, the jurisdictional arrangements in other states are not relevant to TransGrid's revenue determination.

In New South Wales and the Australian Capital Territory, TransGrid is the Jurisdictional Planning Body for all expenditure. This enables it to optimise its investment portfolio across all types of expenditure in a way that is not possible under other jurisdictional arrangements. Section 4.3 of TransGrid's revenue proposal explains how it achieves this across all stages of its network investment process, including:

- identification of related, pre-requisite and dependent needs across all categories of capital expenditure, including augmentation and replacement; and
- identification and evaluation of options across the whole portfolio, such as options that may satisfy multiple needs (including across augmentation and replacement).

It is not unusual to have some projects that satisfy both augmentation and replacement needs. In TransGrid's 2009/10 to 2013/14 portfolio, projects that satisfied both replacement and augmentation needs included:

- augmentation of substation capacity by replacing existing transformers with larger transformers, where the existing transformers were nearing end of life and not suitable for reuse;
- upgrades to substation fault levels by replacing switchgear that was also nearing end of life based on condition; and
- augmentation of transmission capacity by construction of a new 330kV transmission line, which would then allow for the decommissioning rather than replacement of a parallel 132kV transmission line.

In such cases, where there are both augmentation and replacement drivers, TransGrid typically categorises the projects as augmentation. However, if the augmentation driver disappears, the replacement still needs to be undertaken. Where an augmentation project also meets replacement needs, there is interaction between augmentation and replacement expenditure.

5.5.3 Engineering Review

As part of its review of replacement expenditure, the AER engaged EMCa to provide advice on the prudence and efficiency of the projects and programs TransGrid proposed as replacement expenditure. EMCa provided its advice in a report to the AER in October 2014.[63]

TransGrid has reviewed EMCa's report and considers that, while some of EMCa's observations are fair, others reflect errors of fact and insufficient regard to the information TransGrid provided to the AER accompanying the revenue proposal.

Further, EMCa has selectively referenced the information available to it and drawn inferences in the absence of information in a way that does not provide a balanced view.

[63] EMCa, *Review of Proposed Replacement Capex in TransGrid Revenue Proposal 2014 – 2019*, October 2014.

Finally, the observations made by EMCa do not support its conclusions, and EMCa has also not provided any analysis to support its conclusions.

TransGrid's response to the key issues raised in EMCa's review are summarised as follows. A detailed response that more comprehensively addresses the specific observations, issues and procedural shortcomings in EMCa's review is attached as Appendix F.

Governance and Management Framework Review

In its report, EMCa made a number of observations about TransGrid's governance and management framework.

In November 2014, TransGrid achieved full certification to ISO 55001, an internationally recognised standard on asset management. The comprehensive audit against this standard reviewed TransGrid's asset management systems and processes and found them to be fit for purpose. TransGrid acknowledges that there is always scope for improvement in any system or process, and is committed to continuous improvement to ensure that its asset management system remains in line with good practice.

EMCa's observations in its report appear to be based on specific previous experience of its personnel in asset management, rather than necessarily addressing the question of whether TransGrid's asset management systems are fit for purpose. For example, in its review of EMCa's report, AMCL found that:

> EMCa made multiple comments and observations that appear to be based on management strategies that are more relevant to distribution assets, which are typically characterised by many assets with low consequences and relatively high probabilities of failure. These distribution-focused management strategies are generally not suitable to TransGrid's transmission business and asset types. EMCa's observations and comments in this regard, particularly in its analysis of TransGrid's substation and transmission line assets, are thus considered to be inappropriately justified.[64]

TransGrid considers that while its asset management systems may differ in specific elements from those with which EMCa's personnel have had experience, this does not imply that they are unfit for purpose.

TransGrid has provided further detail on this in Appendix F.

Top-Down Assessment

In its report, EMCa expressed concerns that TransGrid had not undertaken a top-down assessment of its portfolio, stating that:

> We did not find sufficient evidence of review and analysis of the overall portfolio to ensure an efficient level of expenditure.[65]

The AER expressed similar concerns in its draft decision, stating that:

> In our view, applying a top-down assessment is a critical part of the process in deriving a forecast capex allowance. It indicates that some level of overall restraint has been brought to bear. This is an important factor for us to consider in deciding whether we are satisfied that a proposed forecast capex allowance reasonably reflects the capex criteria. In particular, to derive an estimate of capex by solely applying a bottom-up assessment does not itself provide any evidence that the estimate is efficient. Bottom-up assessments have a tendency to overstate

[64] AMCL, *AMCL Review of EMCa's Report to the Australian Energy Regulator*, 23 December 2014, pp4-5.
[65] EMCa, *Review of Proposed Replacement Capex in TransGrid Revenue Proposal 2014 – 2019*, October 2014, p11.

> required allowances as they do not adequately account for inter-relationships and synergies between projects or areas of work which are more readily identified at a portfolio level.[66]

TransGrid accepts that ideally, a bottom-up build up of a portfolio should be accompanied by a top-down assessment. However, TransGrid does not accept that the absence of a top-down assessment indicates that forecasts are overstated. It simply indicates that forecasts have not been comprehensively tested using top-down techniques.

In response to the AER's concern that bottom-up assessments do not adequately account for interrelationships and synergies, TransGrid notes that its network investment process does account for these interrelationships and synergies through optimisation at all stages of the process. In its revenue proposal, TransGrid explains that its practices optimise the capital portfolio:

- identification of related, pre-requisite and dependent needs, across all expenditure categories including augmentation and replacement, from the earliest stage of identifying needs;
- identification and evaluation of options across the whole portfolio, such as options that may satisfy multiple needs;
- selection of the most appropriate sourcing and delivery strategy for each project; and
- post-project review of each project's outcome against the original need and identification of key learnings.[67]

These optimisation practices have been applied to TransGrid's forecast portfolio in its revenue proposal, and are evidenced in the supporting documentation provided to the AER with the revenue proposal.

Further, TransGrid has provided a more comprehensive top-down assessment in Section 5.5.2 of this revised proposal. The top-down assessment indicates that TransGrid's forecast replacement expenditure addresses a similar threshold of risk to its historical replacement expenditure, thereby satisfying the capital expenditure objectives to maintain quality, reliability, security and safety. It also indicates that TransGrid's forecast capital expenditure is reasonable in the context of the long-term sustainability of its network, and at a level commensurate with replacement rates of other Australian and international networks of similar age and technology.

Therefore, TransGrid considers that its portfolio optimisation practices and the top-down assessment provided in this revised revenue proposal support its forecast replacement expenditure as being prudent and efficient.

Methodology for Quantifying Risk

In its report, EMCa suggested that TransGrid's application of its risk assessment tools exhibits a bias to overestimation of the risk. EMCa's specific concerns were that:

- the summation of the risk costs of five categories of risk overstates the risk;
- assessment was undertaken at too high a level to identify meaningful risk management actions; and

[66] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure*, November 2014, p6-18.
[67] TransGrid, *Revenue Proposal 2014/15 – 2018/19*, 2 June 2014, p58.

- the effectiveness of current risk mitigation controls was not included in the risk assessment.

TransGrid's risk assessment methodology, while producing relatively high numbers, is effective in identifying risks that require an assessment of possible control measures. However, a detailed condition assessment sets out the specific condition issues and is used to develop the scope of solutions. The Network Investment Process is then employed to ensure that the most efficient network or non network solution is employed.

In response to EMCa's concerns, to check the sensitivity of its proposed portfolio to the values of risk, TransGrid recalculated the values of risk for each project using a conservative application of the method proposed as good practice by EMCa. That is, TransGrid used the single value of the maximum of the safety, reliability or environmental risk. Using the revised values, the full portfolio is still required.

Further, TransGrid does not consider that the risk assessment was undertaken at too high a level to identify meaningful risk management actions, as the risks were assessed based on detailed condition assessments of the relevant assets relating to each need. The extent to which EMCa reviewed TransGrid's detailed condition assessments is unclear from its report.

TransGrid also advises that the effectiveness of current risk mitigation controls was considered in its risk assessments.

Therefore, EMCa's concern that the aggregated risk scores are resulting in a strong overestimation of risk does not affect TransGrid's forecast capital expenditure.

Further detail on this is provided in TransGrid's comprehensive response to EMCa's review in Appendix F.

Need Identification and Option Evaluation

In its report, EMCa suggested that options analysis was limited to large, discrete options.

In most cases, the "large discrete options" to which EMCa refers were developed by consolidating a range of replacement plans that apply to specific families of equipment, for example, of the same make, model and type. The need statements and option evaluations for these have been provided to the AER in the supporting documentation for asset strategy programs. EMCa has not demonstrated that it has had regard to the documentation for these asset strategy programs in forming its view.

Where a particular site has a clear majority of equipment due to be replaced under asset strategy programs, a more efficient way to handle these programs in a consolidated manner is through a substation renewal. A substation renewal also considers the condition of key infrastructure in the substation, such as civil works and steelwork. The most economically efficient option across the whole site is then selected, as presented in the revenue proposal.

In considering the most economically efficient option to meet each need, TransGrid considers "piecemeal replacement" or "selected plant replacement" options that comprise the minimum replacement of equipment needed to address the specific risks that have been identified. These options comprise an initial program of works to address immediate risks, and consider the costs of later works to address remaining asset replacements as they arise.

Where TransGrid has selected an option other than a "piecemeal replacement" option, it is because that option has been demonstrated to be more economically efficient. For example, an adjacent rebuild can be more cost effective than selected plant replacement where the

significant majority of equipment and infrastructure at site require replacement. This is because extensive brownfield works are generally more expensive than greenfield works due to the need for staging and to work incrementally in a live substation.

Therefore, TransGrid does not consider that EMCa is correct in its assertion that options analysis was limited to large discrete options.

EMCa cited three particular examples of projects in support of its assertion.[68] However:

- for the example of Wagga 132 substation renewal, the option EMCa has suggested is the option TransGrid has included in the revenue proposal;
- for the example of Cooma, the option EMCa has suggested would not address 13 of the 14 specific risks requiring action at the site; and
- for the example of the communications OPGW work, TransGrid notes that the purpose of this work is to establish fault tolerant communications rings, which would be hindered if some of the works proposed for 2014/15 to 2017/18 were deferred.

Therefore, TransGrid does not consider that EMCa's examples are valid and does not consider that its concerns regarding options analysis are founded.

Response to Conclusions on Substation Renewals

EMCa reviewed a sample of five substation renewal projects, comprising two committed projects (Tamworth 132 and Cooma) and three future projects (Canberra, Vales Point and Wagga 132).

TransGrid's response to EMCa's key findings is as follows.

- EMCa suggested that some projects would be likely to slip from the forthcoming period, but provided no evidence to support its assertion, relying on conjecture. TransGrid has a demonstrated capability of delivering a portfolio of the size proposed in its revenue proposal, and considers that EMCa's assertion is unfounded.
- EMCa considered that TransGrid had not demonstrated a cost-benefit assessment for the Newcastle substation renewal project. TransGrid had provided a cost-benefit assessment, and as stated above, has confirmed that the project is still prudent under EMCa's suggested alternative risk assessment method.
- EMCa suggested that consideration of reasonable alternatives would result in the deferral of the Wagga 132 and Tamworth 132 projects. TransGrid had already deferred the Wagga 132 project similarly to EMCa's suggestion, as reflected in the forecasts in its revenue proposal. EMCa's suggested alternative for Tamworth 132 would not address the needs at this site.
- EMCa noted the inclusion of secondary system replacements and civil works within substation renewal projects, and suggested some of these works could be deferred. TransGrid notes that these assets have been assessed in its condition assessments and considers that their inclusion is justified based on individual asset condition. Conversely, EMCa has provided no evidence or analysis to support its

[68] EMCa made similar comments in relation to other projects it reviewed in Section 5 of its report. These are addressed in the following sections of this revised proposal.

assertion that scope could be reduced or expenditure deferred. Therefore, TransGrid rejects EMCa's assertion.

- EMCa proposed an alternative solution to the Cooma substation renewal. However, the option EMCa has suggested would not address 13 of the 14 specific risks requiring action at the site. Further, EMCa raised concerns that equipment at site that is still in acceptable condition may not be reused. TransGrid confirms that this equipment will be reused, as is clear from the Joint Planning Report with Essential Energy on the project.

Therefore, TransGrid rejects EMCa's findings related to substation renewals, as it considers them to be unfounded and unreasonable.

EMCa recommended a reduction in expenditure on substation renewal projects of 10% to 20% based on its findings. TransGrid rejects the conclusion reached by EMCa. TransGrid also notes that the AER selected the upper end of this reduction without sufficient rationale.

Response to Conclusions on Transmission Line Renewals

EMCa reviewed a sample of TransGrid's transmission line renewal projects, comprising one life extension (Line 22), two wood pole replacements (Lines 99F and 96H) and one partial rebuild (Line 99J).

TransGrid's response to EMCa's key findings is as follows.

- EMCa suggested that aspects of steel tower refurbishment projects have been engineered conservatively and that risk assessments could be expanded to review individual towers. TransGrid advises that its estimates have been prepared to ±25% accuracy and reflect the most likely cost of the works. Further, the risk assessments reflect the consideration of the condition of individual towers, as EMCa has already been advised.
- EMCa considered that for wood pole replacement projects, options such as targeted replacement of individual poles and pole reinforcement could be considered. TransGrid had proposed four lines for wood pole replacements, and considers that a more targeted option as suggested by EMCa may be suitable for two of the four lines. TransGrid has therefore removed the pole replacement expenditure for those two lines from the capital expenditure forecasts, and added operating expenditure for targeted treatments in this revised proposal.

TransGrid notes that pole reinforcement or nailing is carried out in distribution networks. However, as the failure of a transmission structure has a more significant impact than failure of a distribution structure, nailing is not considered to be the best option for poles of suspect condition.

The main TNSP of which TransGrid is aware that reinforces 132kV poles is Western Power. TransGrid notes that the Western Australian Auditor General, in a recent report, has found that:

> Western Power's management of its wood pole network has been subject to seven inquiries and assessments by regulators in the last five years (Figure 1 overleaf). A significant recent inquiry, completed in 2012, by the Public Administration Committee found:

> "…Western Power has clearly failed to adequately manage its wooden pole asset base to an acceptable level. This is most obviously demonstrated by its 'worst-in-class' status throughout Australia."[69]

TransGrid has some concerns that pole reinforcement is unproven for wood poles at transmission voltages such as 132kV as a routine asset management approach. However, as it is used in a limited number of circumstances, TransGrid is willing to accept an expenditure forecast that reflects the use of pole reinforcement in some circumstances.

EMCa recommended a reduction in expenditure on transmission line renewal projects of 10% to 20%, based on its findings above. TransGrid also notes that the AER selected the upper end of this reduction without sufficient rationale. Having adopted EMCa's recommendation for targeted options for two of the transmission lines proposed for wood pole replacement, TransGrid considers that the forecast expenditure in this revised proposal is a suitable forecast without further reduction.

TransGrid notes that EMCa has referred in its report to transmission line projects as rebuild projects. However, TransGrid does not consider that this is an appropriate description of these projects, as TransGrid has considered and in many cases proposed low cost options to avoid rebuilds where there is a prudent and lower cost option.

Response to Conclusions on Secondary System Renewals

In its review, EMCa reviewed a sample of four secondary system renewal projects, comprising two committed projects (Liddell and Sydney West) and three future projects (Beryl and ANM).

TransGrid's response to EMCa's key findings is as follows.

- EMCa suggested that TransGrid would encounter significant challenges to implement all of its proposed projects in the regulatory control period, given the significant increase in secondary system replacements from the previous period. TransGrid notes that it has installed and commissioned a similar number of secondary systems in the previous regulatory control period, many as part of augmentation projects. Therefore, TransGrid considers that the deliverability of its proposed portfolio is feasible.
- EMCa expressed concerns that TransGrid's strategy results in an aggressive technology driven replacement program, and that the strategy did not take into account specific risks associated with each site. TransGrid rejects these concerns, as it undertook secondary system site assessments that considered site specific conditions at each site for which replacements are proposed. These were included in the investment documentation that was provided to the AER with the revenue proposal.
- EMCa expressed concerns that site based projects would result in the replacement of some of the more modern systems at the site, noting that these would be the minority of systems at those sites. EMCa also expressed concern that strategy documents did not reference reuse of relays with remaining life as spares. As TransGrid explained to EMCa following the one day workshop, its normal practice is to reuse relays with remaining life as spares. The absence of this information in the strategy documents does not, in itself, provide grounds for EMCa's conclusion.

[69] Western Australian Auditor General, *Western Power's Management of its Wood Pole Assets*, November 2013, p5.

- EMCa claimed that project documentation describing asset condition and options was sparse, and did not contain details of specific performance issues with secondary systems equipment. TransGrid notes that the site specific projects were developed by consolidating a range of replacement plans that apply to specific types of devices, where the significant majority of devices at a site are due for replacement. The need statements and option evaluations for these have been provided to the AER in the supporting documentation for asset strategy programs. It is unclear whether EMCa has had regard to the documentation for these asset strategy programs in forming its view.
- EMCa considered that ANM substation should not require a complete secondary systems renewal, but interim works or more targeted replacements could be feasible. As ANM substation supplies only one customer, TransGrid has sought and gained agreement from that customer to undertake only minimum secondary system replacements, on the understanding that the site will carry increasing risks compared to the remainder of TransGrid's network.
- EMCa stated that for Beryl, only a complete replacement option was considered. This is incorrect. TransGrid considered two options for the secondary systems replacement at Beryl and selected the option that retains the use of existing low voltage cabling. Further, all metering systems were specifically excluded from the proposed replacement.
- EMCa claimed a discrepancy in the need date for Liddell secondary systems replacement between the investment documentation (2020) and revenue proposal (2019). TransGrid has not been able to find this discrepancy, and observes that the investment documentation and revenue proposal are aligned with the need date of 2020.
- EMCa suggested that for Sydney West, the evaluations are insufficient to justify the total work scope and cost. EMCa has also cited a statement in the investment documentation that TransGrid cannot find, that secondary cables can last for one more secondary system cycle. The documentation actually states that a significant proportion of cable insulation is approaching end of life and exhibiting low cable insulation resistance, and there is evidence of rodent damage to cable insulation throughout the switchyard.

On this basis, TransGrid rejects EMCa's findings relating to secondary system renewals, and considers that EMCa has made many of its assertions with incomplete, inaccurate or misleading regard to the information TransGrid provided the AER accompanying its revenue proposal.

EMCa recommended a reduction in expenditure on substation renewal projects of 20% to 30%, based on its findings above. TransGrid also notes that the AER selected the upper end of this reduction without sufficient rationale. Aside from the change to the scope at ANM, which has been incorporated into the forecasts in this revised proposal, TransGrid does not consider that EMCa has justified a reduction in secondary systems renewal expenditure and considers that the forecast expenditure in this revised proposal is a suitable forecast.

Response to Conclusions on Communications Projects

In its review, EMCa reviewed TransGrid's proposed expenditure for communications upgrades.

TransGrid's response to EMCa's key findings is as follows.

- EMCa suggested that the proposed optical ground wire (OPGW) strategy was aggregated at too high a level with a single risk assessment and options analysis, rather than considering the justification of individual projects. TransGrid notes that one of the key outcomes of this work is to establish fault tolerant communications rings, which cannot be established by individual projects, thus its consideration as a strategy as a whole. The establishment of fault tolerant communications rings would be hindered if some of the works proposed for 2014/15 to 2017/18 were deferred.
- EMCa suggested that the level of expenditure during the last regulatory control period is a better indicator of a prudent level of expenditure. For the reasons set out in Section 5.5.2, TransGrid does not consider that past expenditure is a suitable predictor of future expenditure, and rejects EMCa's suggestion.

Therefore, TransGrid rejects EMCa's findings on communications projects.

EMCa recommended a reduction in expenditure on communications projects of 50% to 60%, based on its findings above. TransGrid rejects the conclusion reached by EMCa on the grounds that the communications strategy should be considered as a whole, given the nature of the benefits. TransGrid also notes that the AER selected the upper end of this reduction without sufficient rationale.

Response to Conclusions on Other Categories

In its review, EMCa contended that its findings are likely to be generally applicable to other categories of replacement expenditure, and recommended a pro rata reduction to the other categories of 20% to 30%.

TransGrid considers that EMCa's recommendations for reductions to proposed expenditure in the four main categories of review are generally unsupported by evidence and unreasonable. Therefore, TransGrid rejects the conclusion reached by EMCa.

Further, TransGrid also notes that other categories of proposed replacement capital expenditure are different in nature to the categories reviewed by EMCa. For example, asset strategy programs relate to individual items of equipment, rather than aggregated renewals by location. Therefore, EMCa's assertion that options analysis was limited to large, discrete options discussed above is not relevant to these types of projects. While TransGrid disagrees with EMCa's conclusions on its four main categories of review, even if there was merit in EMCa's conclusions, they would not similarly apply to all other categories of replacement expenditure.

5.6 Security/Compliance

Security/compliance expenditure is driven by external compliance requirements such as legislation, jurisdictional requirements or particular standards. These drivers are different from general augmentation and replacement expenditure.

Some of the drivers of security/compliance expenditure include:

- legal obligations, such as work health and safety and environmental obligations;
- a duty of care, such as to ensure public safety around the network;
- requirements of the National Electricity Rules, such as those relating to quality of supply and power system security; and

- Australian Standards and industry codes of practice.

Around two thirds of TransGrid's proposed security/compliance expenditure is to remediate low spans on transmission lines. The other third is for various other types of projects.[70]

In the draft decision, the AER considered that security/compliance expenditure forms part of replacement expenditure.[71] This is incorrect. The information provided to AER accompanying the revenue proposal makes it clear that security/compliance expenditure includes some replacement work and some works other than replacement.

The works other than replacement in TransGrid's forecast security/compliance expenditure for 2013/14 to 2017/18 are:

- reconfiguration of series reactors to reduce the loading on 41 cable to ensure system security, given concerns about the condition of the cable;
- extensions to communications networks to comply with AEMO's Power Systems Data Communication Standard;
- installation of surge arresters at 330kV transmission line entries, to ensure system security;
- installation of a new multiple contingency protection scheme to protect against cascading system voltage collapse; and
- installation of new quality of supply monitors at customer connection points.

As the need for security/compliance expenditure is driven by external requirements, the use of trend analysis to assess expenditure forecasts is not appropriate. This is because changes to legislation, the Rules and relevant standards do not necessarily take place at a consistent rate over time, and therefore the expenditure to respond to these requirements may be irregular.

5.6.1 Low Span Remediation

A transmission line span refers to a section of conductor between two towers. The conductor is required to be at least a certain height above ground, such that it remains well clear of people and vegetation. The higher the power transfer on a transmission line, the lower the conductor will sag, due to expansion of the conductor as it heats up with higher power transfer.

If the transmission line conductor sags too low, electricity can jump to objects such as vehicles, people, vegetation or the ground. The conductor does not need to be touching the object for this to happen, but can jump through air if it is sufficiently close to the object. This phenomenon creates the risk of serious electrocution or initiation of a bushfire if a conductor sags too low.

Since its last revenue proposal, TransGrid has conducted aerial laser surveys of all of its transmission lines. Aerial laser surveys provide accurate measurement of transmission line clearances from ground and vegetation growth, with greater accuracy and less effort than previous manual techniques.

[70] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure*, November 2014, p6-41.
[71] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure*, November 2014, p6-40.

The surveys identified approximately 2,000 spans on TransGrid's network that, based on accurate measurement, do not meet their original mandated design clearances between the transmission line conductors and ground to varying degrees.

TransGrid commenced remedial work on the highest priority transmission lines to increase the clearances between the conductors and ground in the 2009/10 to 2013/14 regulatory control period. It also implemented interim risk management measures on spans on other lines, such as warning signs and installation of access barriers.

The forecast capital expenditure in the revenue proposal included projects to address some of the more critical low spans on the next priority lines.

The AER rejected TransGrid's forecast expenditure for low span remediation and substituted an alternative forecast that reduces this expenditure by 85%. The AER's reduction appears to be based on the premise that because the low spans on TransGrid's network have not caused an injury, fatality or significant bushfire to date, there is not a legitimate need to address the risk beyond actions with a cost no greater than $5 million. TransGrid considers the AER's approach to be inappropriate and not in line with good electricity industry practice, or with the expectations of the community in relation to bushfire risks.

TransGrid's forecast expenditure on low span remediation and average annual impact on a typical residential consumer bill are shown in Table 5.5.

Table 5.5
Forecast of Low Span Remediation Expenditure ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	5.9	11.4	23.1	38.1
Average annual impact on typical residential bill	Increase of 37 cents per year			

Source: TransGrid.

TransGrid has included a detailed response on low span remediation as Appendix G, and summarised the key elements of the response as follows.

The Requirement to Remediate Low Spans

TransGrid is required to manage its network in a manner that ensures the safety of its staff, contractors and the public. This is required by:

- the expenditure objectives in the National Electricity Rules;
- the *Electricity Supply (Safety and Network Management) Regulation 2014*;
- work health and safety legislation;
- TransGrid's enabling legislation; and
- the requirement in the National Electricity Rules for all registered participants to maintain and operate all equipment in accordance with good electricity industry practice and relevant Australian Standards.

The expenditure objectives in the National Electricity Rules require TransGrid to:

> 4. Maintain the safety of the transmission system through the supply of prescribed transmission services.[72]

The *Electricity Supply (Safety and Network Management) Regulation 2014* requires TransGrid to:

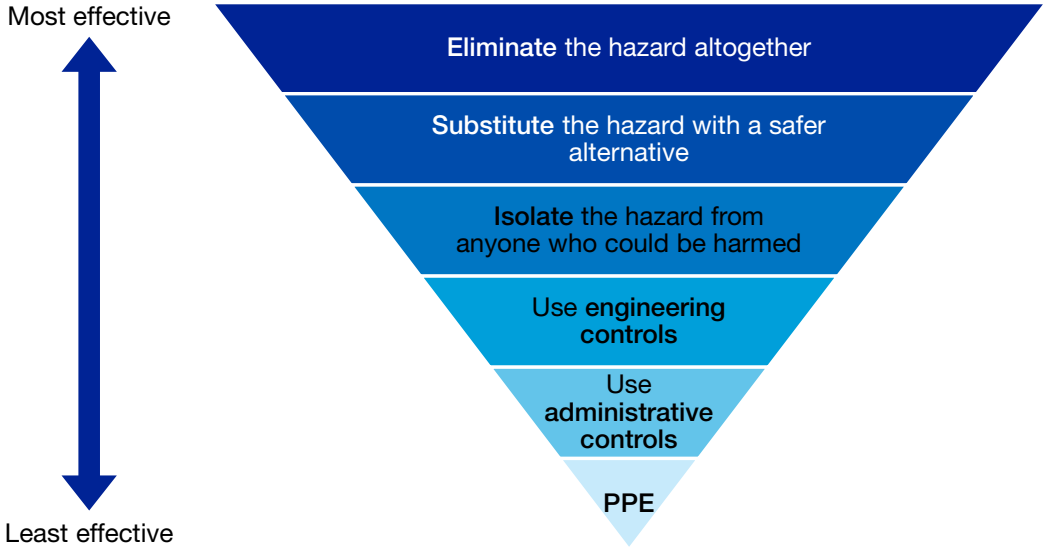
> … take all reasonable steps to ensure that the design, construction, commissioning, operation and decommissioning of its network (or any part of its network) is safe.[73]

Work health and safety legislation[74] requires TransGrid, as a person conducting a business or undertaking (PCBU) to ensure workers and others are not exposed to a risk to their health and safety.

As part of this obligation, a PCBU must consider various control options and choose the control that most effectively eliminates the risk. When a risk cannot be eliminated, the PCBU must choose the control measures that most effectively minimises the risk. This may involve a single control measure or a combination of different controls that together provide the highest level of protection that is reasonably practicable.

The hierarchy of controls, shown in Figure 5.7, sets out the types of control measures that can be used to manage risks to health and safety, in order of effectiveness.

Figure 5.7
Relative Trend in Levels of Risk Addressed by Capital Portfolios



Source: TransGrid and Workcover NSW.[75]

TransGrid's enabling legislation requires it to:

> … operate efficient, safe and reliable facilities for the transmission of electricity and other forms of energy[76]

[72] *National Electricity Rules*, Clauses 6A.6.6(a)(4) and 6A.6.7(a)(4).
[73] *Electricity Supply (Safety and Network Management) Regulation 2014*, Clause 5.
[74] Work Health and Safety Act 2011.
[75] Workcover NSW, *Hierarchy of Controls*, Catalogue No WC02089.
[76] *Energy Services Corporations Act 1995 No 95*, Clause 6B(1)(d).

The National Electricity Rules require all registered participants, which includes TransGrid, to:

> … maintain and operate (or ensure their authorised *representatives* maintain and operate) all equipment that is part of their *facilities* in accordance with:
>
> (1) relevant laws;
>
> (2) the requirements of the Rules; and
>
> (3) *good electricity industry practice* and relevant *Australian Standards*.

Aside from the clear importance of ensuring the public safety of TransGrid's network, these compliance requirements place a clear obligation on TransGrid to ensure that its transmission lines comply with relevant standards.

The Consequence of Inaction

While the low spans on TransGrid's network have not caused an injury, fatality or significant bushfire to date, TransGrid does not consider that this provides a reasonable basis or justification for inaction. TransGrid notes that there have been incidents of public injury due to low spans on other networks, and that the environmental and safety consequences of bushfire risk are significant.

For example, in November 2008, a truck driver sustained injuries while unloading sheep from the top deck of a B-double vehicle when coming into contact with an overhead power line. In October 2014, the New South Wales Supreme Court made a judgement awarding damages to the injured, finding that:

> Country Energy's failure to take the reasonable precaution of constructing the line so as to give a ground clearance in accordance with its design of 6ms was negligent and caused an immediate risk of harm to persons passing under the line (Cf. *Sydney Water Corporation v Turano* [2009] HCA 42; 239 CLR 51 at [49]). That the risk of harm did not ensue for a period of eight years following its construction was a matter of chance and neither undermines the risk of harm, nor its seriousness.
>
> A reasonable person in the position of Country Energy would have taken that precaution because of the following three matters… The first matter is the likely seriousness of the harm (death by electrocution or serious electric shock). The second matter is the burden of taking such precautions, which, having regard to the design of the line by Country Energy which specified a ground clearance of 6m, I do not consider to be onerous. The third matter is the social utility of the provision of electricity, being the activity that created the risk of harm, including on country properties to facilitate their use as productive producers of primary produce.[77]

Further, the environmental and safety consequences of bushfire risk have been clearly highlighted by the bushfires in Victoria in January and February 2009. The 2009 Victorian Bushfires Royal Commission estimated the major economic costs of these fires to be $4.37 billion, which it considered a conservative estimate.[78]

TransGrid is aware that the NSW Rural Fire Service has also raised concerns with the AER in regards to the impact of electricity networks on bushfire risk. The NSW Rural Fire Service has highlighted its concern that any moderation in vegetation management and preventative programs by the industry may potentially increase the bushfire risk to communities.

[77] Supreme Court New South Wales, *Courts v Essential Energy (aka Country Energy)*, 29 October 2014, paragraphs 65, 60.
[78] 2009 Victorian Bushfires Royal Commission, *The Fires and the Fire-Related Deaths: Final Report Volume 1*, July 2010, p345.

Notwithstanding that the low spans on TransGrid's network have not caused an injury, fatality or significant bushfire to date, TransGrid does not consider this to justify inaction. TransGrid considers that its proposed remediation of low spans in the 2014/15 to 2017/18 period is required as a reasonable precaution to provide ground clearance in accordance with the original design standards that apply to those spans. It is also required to minimise the risks so far as is reasonably practicable, as is TransGrid's obligation as a PCBU under work health and safety legislation.[79]

The Relevant Standard for Remediation

In the draft decision, the AER questioned whether AS 7000 is a relevant standard for the remediation of low spans, particularly for transmission lines that were constructed to a different original design standard.

AS 7000 is a relevant Australian standard because:

1. Under Clause 13(1) of the *Electricity Supply (Safety and Network Management) Regulation 2014*, the Director General of NSW Trade & Investment has advised TransGrid that it must take into account the *Electricity Transmission and Distribution Asset Management: Code of Practice* in its Network Management Plan. This code of practice cites the guideline C(b)1, which has since been superseded by AS 7000, as a standard that applies to overhead line clearances.
2. Where existing overhead lines are proposed to be altered such that elements of the overhead line may be overloaded or overstressed to the original design standard, then the line is required to be assessed for compliance with the provisions of AS 7000.[80]

The majority of the requirements in AS 7000 relate to providing physical requirements for the overhead line design to make sure that it can withstand the environmental conditions to which it will be subject in its lifetime. As stated in the standard, it is "not intended to be retrospectively applied to routine maintenance and ongoing life extension of existing overhead lines",[81] and TransGrid is not applying this standard to the maintenance and life extension of existing lines in an overall sense.

TransGrid has assessed all of its transmission lines to identify spans that do not meet their original design clearances between the conductors and ground. Some transmission lines were built under previous design standards that specified lower clearances than AS 7000. TransGrid does not propose to remediate spans that meet their original design standards.

Where TransGrid has identified transmission line spans that do not meet their original design standards, it has an obligation to remediate those spans to ensure compliance with the original design standards. However, when remediating those spans, if there is potential for them to be overloaded or overstressed to the original design standard, they are required to be assessed for compliance with the provisions of AS 7000, as noted above.

Any work that involves increasing the height of transmission line conductors can introduce additional loadings to the physical requirements for the overhead line, generally through increased line tensions. This can result in a requirement for reassessment of the line "by a competent person for compliance with the provisions of this Standard".[82] Once this detailed review is undertaken, the requirements of the standard in terms of ground clearances also

[79] Work Health and Safety Act 2011, Clause 17.
[80] AS/NZS 7000:2010, *Overhead Line Design – Detailed Procedures*, 2010, p7.
[81] AS/NZS 7000:2010, *Overhead Line Design – Detailed Procedures*, 2010, p7.
[82] AS/NZS 7000:2010, *Overhead Line Design – Detailed Procedures*, 2010, p7.

apply. The specified ground clearances in the current standard in comparison with earlier standards are the same at 132kV, within the accuracy of the aerial laser survey at 220kV[83] and minor at 330kV, as shown in Table 5.6.[84]

Table 5.6
Clearances in AS 7000 and Previous Design Standards

	132kV	220kV	330kV
C(b)1 until 1991	6.7m	7.6m	7.6m
AS 7000 and C(b)1 from 1991	6.7m	7.5m	8.0m
Variance	0m	-0.1m	0.4m

Source: AS 7000 and various revisions of C(b)1.

As remediation designs are finalised, the applicability of the use of AS 7000 clearances will be reviewed on a span by span basis. In preparation of the planning estimates, it has been considered that compliance with AS 7000 will be required due to the magnitude of the clearance violations being remediated. The violations proposed to be remediated in 2014/15 to 2017/18 range from 0.4m to over 3m, with an average of 0.93m, compared to the original design standards. Therefore, TransGrid considers this to be reasonable.

Scope Proposed by TransGrid

TransGrid has prioritised the low spans for remediation over 10 years.

In the 2014/15 to 2017/18 period, TransGrid proposes to address the spans that are the highest priority, being:

- spans identified as below original design clearance requirements at existing loadings;
- spans on transmission lines identified in the network capability incentive parameter action plan (NCIPAP) for the installation of dynamic line ratings or uprating of terminal equipment, to ensure that the market benefit of the NCIPAP is not impacted; and
- all low spans on transmission lines where over 50% of the low spans are priority spans.

This comprises approximately half of the identified low spans and all of those which present an immediate public safety or bushfire risk. The remaining low spans are classified as low under contingent loading and future operating conditions but do not present a risk under present normal operating conditions. Their remediation can be prudently deferred to a subsequent regulatory control period, when demand forecasts are more certain.

Value of Risk Associated with Low Spans

In the draft decision, the AER estimated the risk to which TransGrid is exposed by low spans as $5 million. The estimate was based on information in a report TransGrid had commissioned from Marsh on insurance and self insurance.[85] The methodology used by

[83] The accuracy of computer line models derived from aerial laser surveys is estimated to be 0.1 metres.
[84] TransGrid is not proposing to remediate any spans at 500kV, and so has not shown a comparison at 500kV as it is irrelevant to forecast capital expenditure.
[85] TransGrid, *Revenue Proposal 2014/15 to 2018/19: Appendix T*, 2 June 2014.

Marsh considered past loss history and only includes the recorded direct financial impact of past losses relevant to external insurance and self-insurance.

Conversely, TransGrid's risk assessment methodology takes a broader perspective, looking at potential future losses and assesses the risk against a number of categories of risk including cost, operational, reliability, environment and safety to assign a value of risk.

Accordingly, TransGrid's value of risk is a combination of direct and indirect future losses, rather than the value of past direct losses used by the AER. TransGrid considers that its value of risk more appropriately reflects the value of risk from all risk factors.

5.6.2 Other Security/Compliance Expenditure

In the draft decision, the AER proposed to reduce security/compliance expenditure other than low spans by 30%, commensurate with its overall reduction for replacement expenditure.

As discussed in Section 5.5.3, TransGrid considers that EMCa's recommendations on which the AER based its reductions to proposed replacement expenditure are unsupported by evidence. Therefore, TransGrid does not consider this reduction to security/compliance expenditure to be appropriate.

Further, TransGrid notes that security/compliance expenditure includes some works other than replacement. Therefore, even if there was merit in the AER's reductions to replacement expenditure, they would not similarly apply to all security/compliance expenditure, as the AER has assumed.

5.7 Support the Business

5.7.1 Strategic Property Acquisition

In the draft decision, the AER rejected four of TransGrid's proposed seven strategic property acquisitions. TransGrid considers that the four strategic acquisitions rejected by the AER are prudent and has included them in the forecasts in this revised proposal.

The four strategic acquisitions rejected by the AER are for:

- Powering Sydney's Future;
- Surry Hills;
- Maraylya; and
- Richmond Vale.

Powering Sydney's Future

In the revenue proposal, TransGrid discussed the Powering Sydney's Future project to investigate the need to reinforce supply capacity to the Sydney inner metropolitan area and CBD in the near future.

The proposal included a number of items of expenditure related to this need:

- the remediation of backfill along the 41 cable route, to retain the rating of this cable;
- reconfiguration of series reactors at Sydney South to adjust sharing of power flows between cables;

- network support to attempt to defer the timing of new network investment;
- strategic route acquisition for a new 330kV cable route from its closest bulk supply point to the Sydney inner metropolitan area, so that TransGrid is able to respond as quickly as possible to install a new 330kV cable should a network investment be required; and
- a contingent project to install a new cable.

During the AER's review of its revenue proposal, TransGrid advised that due to changes in demand forecasts for the Sydney CBD and inner metropolitan area, the date of the forecast capacity shortfall for Powering Sydney's Future was deferred from 2018/19 to 2023/24 and consequently, the network support and contingent project could be withdrawn. However, the AER also removed the strategic property acquisition related to this project from the forecast capital expenditure.

The AER removed the strategic property acquisition as it considered that:

- the City of Sydney proposal to install 477MW of generation in the CBD by 2030 would significantly reduce the CBD demand below that contained in the revised forecast;
- Ausgrid's approach to asset replacement has resulted in the early retirement of assets, and that the proposed retirement program is likely to be several years earlier than economically required; and
- the Ausgrid September 2014 draft demand forecast results in a deferral of the need for the PSF project beyond the 2014-2018 period.

The AER expressed an opinion that Ausgrid's revised demand forecast is optimistic, stating that further reductions in demand should be expected as a result of the City of Sydney's *Tri-generation Master Plan*, which proposed to install 477MW of embedded generation within the Sydney CBD. However, this plan was largely abandoned in June 2013, with City of Sydney citing economic and regulatory hurdles as basis for the plan no longer being viable. The City of Sydney's *Renewable Energy Master Plan*, published in June 2013, discusses obtaining renewable energy within a 250km radius to supply the energy needs of the Sydney inner metropolitan area.

Despite the reduction in demand forecast and deferral of some 132kV cable retirements, a shortfall in supply capacity is still forecast in 2022/23. Following the expected retirement of four Ausgrid 132kV CBD supply cables, a shortfall of around 330 MW is forecast in 2023, increasing to 400 MW by 2027.

TransGrid acknowledges that there is inevitably some uncertainty around forecasts eight years ahead of a potential need date. However, TransGrid considers that there are both upside and downside risks to the forecast capacity shortfall. The AER has identified one source of downside risk, being an increase of embedded generation at a higher rate than is already accounted for in Ausgrid's forecast. However, upside risks include unexpected cable failures and additional load growth in the Sydney CBD and inner metropolitan area stimulated by development plans.

Should it be required, a network solution to Powering Sydney's Future has a lead time of around six years. To meet the 2022/23 summer period, preliminary works would need to be commenced in 2015/16, including strategic property acquisition to secure a cable route that would avoid the need for expensive tunnelling works.

Further, the WestConnex road infrastructure project comprises the construction of 33km of motorway, including a major interchange in the vicinity of property TransGrid would require for its future cable route. In November 2014, the WestConnex Development Authority (WDA) announced plans for Stage 2 of the WestConnex project, known as the "New M5". TransGrid met with the WDA to understand the impact of its works. Of particular interest is that by 2019 the WDA proposes to upgrade key roads in the area to act as motorway exit and entry points.

The strategic land acquisitions proposed by TransGrid to provide cable access are likely to be affected by the WestConnex project. Therefore, it is both imperative and prudent that TransGrid is able to secure a cable route for the future cable in conjunction with the WestConnex project.

Given the property acquisition is more economic than the alternative of tunnel access, the preferred timing of the land acquisitions is to commence in 2015/16, based on a six year lead time.

TransGrid has reinstated strategic property acquisition relating to the Powering Sydney's Future project in its forecast capital expenditure, with a change in timing to meet the constraints discussed above.

TransGrid will continue to pursue network support solutions to defer a potential network solution. However, it is also prudent that TransGrid not close off the option of a cost effective network solution. This strategic property acquisition will retain the option of a network solution, should it be required.

The forecast expenditure for the Powering Sydney's Future strategic property acquisition and average annual impact on a typical residential consumer bill are shown in Table 5.7.

Table 5.7
Forecast Expenditure on Powering Sydney's Future Property ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	0.0	0.0	5.6	13.8
Average annual impact on typical residential bill	Increase of 9 cents per year			

Source: TransGrid.

Surry Hills

In the revenue proposal, TransGrid proposed to acquire a property at Surry Hills that has become available on an opportune basis. The property, currently owned by Ausgrid, is ideally situated for the development of electricity infrastructure in an already highly developed area, and is one of the last undeveloped sites in the Sydney inner metropolitan area. Should TransGrid forgo the opportunity to purchase this property, it would most likely be developed for alternative purposes. This would significantly increase the uncertainty and risk of future property acquisition in the inner metropolitan area.

In the draft decision, the AER stated:

> In our view, until such time as Ausgrid confirms its intention to dispose of the Surry Hills site and its anticipated sale proceeds, there is no basis for allowing TransGrid's forecast capex for this

> acquisition in the 2014–18 period… This conclusion will be reviewed if Ausgrid formally clarifies its intention to dispose of the asset in the 2014-18 period.[86]

Ausgrid has confirmed its agreement to sell the Surry Hills site to TransGrid in 2015/16, for a value established by independent valuation from Knight Frank. The scope of the purchase has changed since the revenue proposal, as Ausgrid had originally indicated the intention to retain part of the site but has now made the whole site available for purchase.

TransGrid has included the acquisition of this property in the forecast capital expenditure in this revised revenue proposal.

The forecast expenditure for the Surry Hills strategic property acquisition and average annual impact on a typical residential consumer bill are shown in Table 5.8.

Table 5.8
Forecast Expenditure on Surry Hills Property ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	0.0	53.0	0.0	0.0
Average annual impact on typical residential bill	Increase of 25 cents per year			

Source: TransGrid.

Maraylya and Richmond Vale

In the draft decision, the AER stated that the Richmond Vale and Maraylya Acquisitions are not required within a 30 year window if AEMO's medium growth planning scenario forecasts are used, and that consequently it is not reasonable to purchase property for an asset that may or may not be required within the 30 year window.

These two strategic property acquisitions are planned on the same basis, that they will provide an economic benefit to electricity consumers. TransGrid undertakes planning considering the need for providing an adequate transmission system, in the short term (zero to five years), medium term (five to 10 years) and in the long term (beyond 10 years). The long term plans are reviewed regularly, approximately every five years, and communicated to the stakeholders in the form of a planning report titled *Network Development Strategy*. The most recent update was published in early 2014.

The long term network development strategy considers the network modifications required under different scenarios of demand growth and corresponding generation developments and retirements. The objective of the long term plans is to ensure the benefits of the existing network are maximised under a range of the possible future scenarios.

Strategically, in order to maximise the future value of the network, the options to optimally expand the network are required to be retained. The strategic locations where optimal expansions can be economically implemented are very limited, and characterised by proximity to existing 330kV and 500kV transmission infrastructure and ability to utilise the existing easements or viability in procuring easements in the future.

Present and future urbanisation and development at or around these strategic locations is likely to preclude the optimal economic options available. The proposed strategic

[86] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure*, November 2014, p6-51.

acquisitions are to ensure that the options, near North West Sydney and Newcastle, are retained for the economic development of the grid in the future.

Strategic property acquisition is always assessed on a cost/benefit basis and supports the efficient development of the network in the future. Based on economic evaluation, it is in the long term interests of consumers.

TransGrid has included capital expenditure for strategic property acquisitions at Maraylya and Richmond Vale in the forecast capital expenditure in this revised revenue proposal, as it considers that they are in the long term interests of consumers.

The forecast expenditure for the Maraylya strategic property acquisition and average annual impact on a typical residential consumer bill are shown in Table 5.9.

Table 5.9
Forecast Expenditure on Maraylya Property ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	2.2	6.3	0.0	0.0
Average annual impact on typical residential bill	Increase of 4 cents per year			

Source: TransGrid.

The forecast expenditure for the Richmond Vale strategic property acquisition and average annual impact on a typical residential consumer bill are shown in Table 5.10.

Table 5.10
Forecast Expenditure on Richmond Vale Property ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	0.0	2.0	0.0	0.0
Average annual impact on typical residential bill	Increase of 1 cent per year			

Source: TransGrid.

5.8 Contingent Projects

TransGrid proposed two contingent projects in the revenue proposal:

- a network solution to the Powering Sydney's Future project to supply the Sydney CBD and inner metropolitan area, should it be required; and
- reinforcement of capacity in Southern New South Wales.

5.8.1 Powering Sydney's Future

TransGrid advised the AER during its review of the revenue proposal that the Powering Sydney's Future contingent project was no longer required in the current period, following early advice on the 2014 demand forecasts. TransGrid accepts the AER's draft decision not to approve the Powering Sydney's Future contingent project. However, TransGrid notes that it is possible that some demand management will be required if load growth in the Sydney inner metropolitan area grows above the current forecast.

5.8.2 Reinforcement of Capacity in Southern New South Wales

In its draft decision, the AER provided indicative amendments to TransGrid's trigger for the reinforcement of capacity in Southern New South Wales. The AER stated that:

> If TransGrid proposed a modified trigger that ensures a compliant RIT-T, as determined by us, we consider in principle that the reinforcement of capacity in southern New South Wales would satisfy the NER requirements for a contingent project as:
>
> - the project is reasonably required to be undertaken in order to achieve the capex objectives
> - the proposed contingent capex is not otherwise provided for in the capex proposal,
> - it reasonably reflects the capex criteria in the context of the proposed contingent project as described in the Revenue Proposal
> - the cost of the project exceeds the defined threshold ($30 million or 5 per cent of the value of the maximum allowed revenue for the first year of the regulatory control period), and
> - the occurrence of the trigger event is probable during the 2014–18 period.[87]

TransGrid proposes an amended trigger for this contingent project that incorporates key elements of the AER's indicative amendments and ensures a compliant RIT-T, as determined by the AER. The proposed trigger is:

1. AEMO classification of generation developments as being at the 'committed' stage of development on their 'Generator Information' webpage:
   (i) exceeding 350 MW;
   (ii) in southern New South Wales around Yass/Canberra/Marulan area, or any additional connection points established in this vicinity; and
2. successful completion of the regulatory investment test for transmission demonstrating that a transmission investment is justified; and
3. determination by the AER under Clause 5.16.6 of the National Electricity Rules that the proposed investment satisfies the regulatory investment test for transmission (compliance review); and
4. TransGrid Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the National Electricity Rules.

5.9 Cost Escalation

Labour Cost Escalation

In the revenue proposal, TransGrid proposed to use its employee agreement for the duration of the agreement for committed projects. If proposed to use labour escalation forecasts provided by BIS Shrapnel for future projects and after the expiry of the employee agreement for committed projects.

In the draft decision, the AER rejected the use of an employee agreement to forecast labour costs, and used an average of labour escalation forecasts from BIS Shrapnel and Deloitte Access Economics.

TransGrid accepts the use of average of labour escalation forecasts from BIS Shrapnel and Deloitte Access Economics, and has provided updated forecasts from BIS Shrapnel. This

[87] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 6: Capital Expenditure*, November 2014, p6-91.

has reduced forecast labour escalation in this revised proposal, compared to the draft decision.

The labour rate escalation used in this revised proposal is shown in Table 5.11.

Table 5.11
Revised Labour Rate Escalation (Nominal)

	2013/14	2014/15	2015/16	2016/17	2017/18
Labour escalation (Average of BIS Shrapnel and Deloitte Access Economics EGWWS WPI)	3.2%	3.5%	3.1%	3.6%	3.8%

Source: BIS Shrapnel and Deloitte Access Economics.

Commodity Escalation

In the draft decision, the AER expressed concern regarding the degree of potential inaccuracy in forecasts of commodity escalation.

TransGrid notes that its proposed commodity escalation follows the same methodology as has been used previously in revenue determinations, and considers that the AER's concerns regarding commodity escalation do not preclude its use in forecasting.

However, the evidentiary burden the AER would require to alleviate its concerns is sufficiently high that it has proven infeasible to address in the time TransGrid has had to prepare this revised proposal.

Therefore, TransGrid accepts the AER's proposal to use the consumer price index (CPI) in lieu of commodity escalation in this revised proposal, noting that the impact is not material. However, TransGrid does not consider in principle that CPI provides the best forecast of commodity escalation.

Property Escalation

In the draft decision, the AER accepted TransGrid's proposed property escalation. As there has not been an update to the data sources used to calculate the escalation since the revenue proposal, an update to these figures is not required.

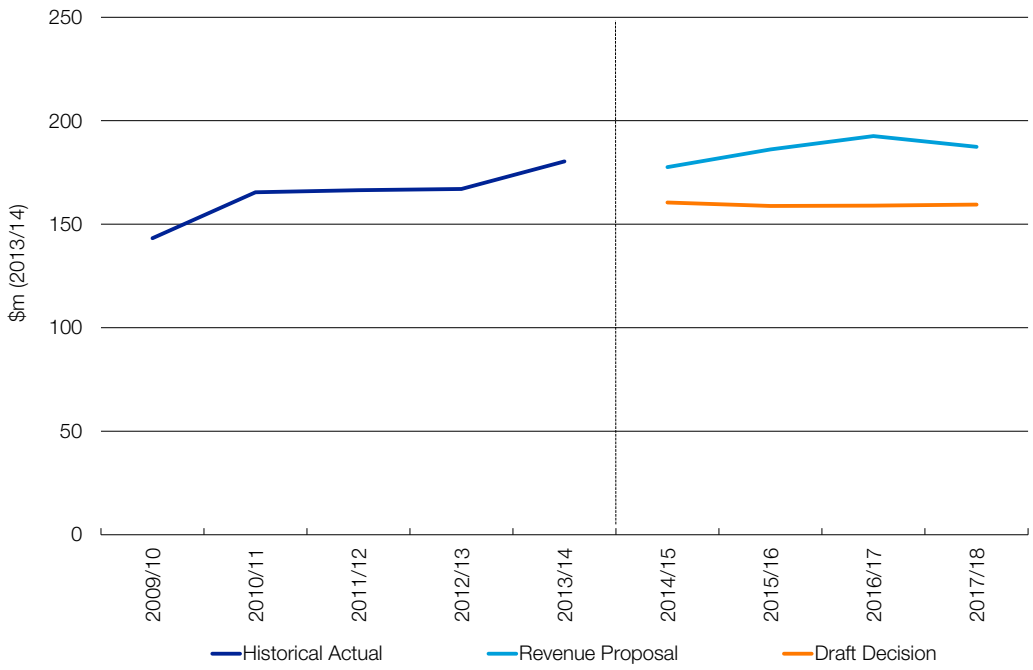
6 Operating Expenditure

Operating expenditure is the ongoing expenditure required to provide transmission services. This includes planning the network, managing assets, 24 hour monitoring and operation of the network, maintenance and business activities.

In the revenue proposal, TransGrid proposed total forecast operating expenditure of $754.6 million for 2014/15 to 2017/18. In the draft decision, the AER substituted total forecast operating expenditure of $647.1 million for 2014/15 to 2017/18.

The difference between the revenue proposal and draft decision is shown in Figure 6.1.

Figure 6.1
Comparison of Operating Expenditure Forecasts ($m 2013/14)



Source: TransGrid and AER. Excludes debt raising costs.

TransGrid does not consider that the allowance in the draft decision would allow it to recover the efficient costs of meeting the operating expenditure objectives.[88]

[88] The operating expenditure objectives are set out in Clause 6A.6.6(a) and in summary are to meet or manage expected demand, comply with regulatory obligations and maintain quality, reliability, security and safety.

Because the AER has not accepted the operating expenditure proposed by TransGrid, it is required to set out an estimate of operating expenditure it is satisfied reasonably reflects the operating expenditure criteria, taking into account the operating expenditure factors.[89]

That is, the operating expenditure forecast must reasonably reflect:

1. The efficient costs of achieving the operating expenditure objectives
2. The costs that a prudent operator would require to achieve the operating expenditure objectives
3. A realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.[90]

TransGrid does not consider that the AER's operating expenditure forecast in the draft decision reasonably reflects the operating expenditure criteria. TransGrid considers that the AER's operating expenditure forecast understates the efficient costs of achieving the operating expenditure objectives because:

- the AER has applied base-step-trend forecasting and bottom-up forecasting inconsistently with its preferred methodology;
- the partial factor productivity benchmarking used by the AER to determine a forecast trend does not effectively measure the efficiency of TNSPs against the operating expenditure objectives and is not fit for purpose;
- the AER has not adequately considered the possibilities for substitution between capital and operating expenditure;
- the AER has not allowed expenditure to address the concerns of electricity consumers; and
- the inflation adjustments in the AER's forecasting model are incorrect.

TransGrid has carefully considered whether to accept the AER's methodology for the preparation of the operating expenditure forecasts in this revised revenue proposal. TransGrid prepared an alternative forecast by updating the AER's forecast in the draft decision to correct for observed errors, remove inconsistencies and take account of the most recent information. However, with these changes, the AER's methodology produces a higher forecast than the revised forecast developed using TransGrid's methodology. On this basis, TransGrid has proposed revised forecast operating expenditure based on its own methodology, updated for the matters it has accepted from the AER's draft decision and the most recent information.

TransGrid has set out the forecast operating expenditure it considers is required to achieve the operating expenditure objectives in the 2014/15 to 2017/18 period. The forecast operating expenditure is shown in Table 6.1.

The total forecast operating expenditure is $709.6 million. The reduction compared to the forecast in the revenue proposal is due mainly to:

- removal of network support for the Powering Sydney's Future project, which has been deferred as a result of the 2014 connection point demand forecasts;
- removal of an adjustment for uncompleted easement maintenance in the base year, consistent with the draft decision; and

[89] *National Electricity Rules*, Clause 6A.14.1(3)(ii).
[90] *National Electricity Rules*, Clause 6A.6.6(c).

- reductions to step changes for consumer engagement and demand management innovation.

Table 6.1
Revised Forecast Operating Expenditure ($m nominal)

Category	2014/15 Expected	2015/16 Forecast	2016/17 Forecast	2017/18 Forecast
Maintenance	**77.9**	**86.5**	**91.4**	**83.8**
Maintenance	67.8	73.8	77.0	76.9
Major Operating Projects	10.1	12.7	14.4	6.9
Maintenance Support and Asset Management	11.5	11.9	12.3	12.8
System Operations	9.5	9.8	10.2	10.6
Grid Planning	10.2	10.6	11.0	11.4
Rates and Taxes	5.6	5.9	6.2	6.3
Property	3.4	1.5	1.5	1.6
Health, Safety and Environment	3.8	3.9	4.1	4.2
Information Technology	14.1	14.5	15.0	15.5
Business Administration	12.2	12.7	13.1	13.6
Corporate and Regulatory Management	23.2	27.5	27.7	29.0
Total Controllable Operating Expenditure	**171.4**	**184.7**	**192.4**	**188.8**
Debt Raising Costs	6.5	6.8	7.2	7.4
Insurance	6.1	6.8	7.6	8.5
Self Insurance	0.0	0.0	0.0	0.0
Network Support	0.0	0.0	0.0	0.0
Total	**184.0**	**198.4**	**207.1**	**204.6**

Source: TransGrid. Totals may not add due to rounding.

6.1 Summary of Revenue Proposal

Chapter 6 of TransGrid's revenue proposal set out the methodology, key inputs and assumptions used to determine the operating expenditure forecast for the next regulatory control period.

TransGrid predominantly used a base – step – trend approach to forecasting operating expenditure, particularly where historical expenditure provides a realistic expectation of forecast expenditure. This approach is most commonly suited to expenditure which is recurrent in nature. A variation on the approach was used for maintenance work.

For a small number of categories of expenditure, forecasts were zero-based. This approach was used for categories that comprise specific projects or where market rates provide the best expectation of forecast expenditure.

For its base year, TransGrid proposed 2012/13 actual expenditure with uncompleted easement maintenance reinstated. This is because TransGrid had not completed its expected level of easement maintenance in 2012/13 due to a significant issue with the safety performance of an easement maintenance contractor. TransGrid also proposed to reduce the savings in 2012/13 under the efficiency benefit sharing scheme (EBSS) to ensure no double-recovery of this adjustment.

TransGrid identified three step decreases and seven step increases in operating expenditure that would occur after the base year, which it proposed as step changes.

TransGrid proposed to use its employee agreement for internal labour for the duration of the agreement, and external labour escalation forecasts provided by BIS Shrapnel for internal labour costs beyond the employee agreement and all external labour costs. TransGrid also proposed to apply escalation for network growth, adjusted for economies of scale.

TransGrid proposed bottom-up forecasts for major operating projects, insurance, self insurance (which had a forecast of zero), long service leave and employer contributions to defined benefits superannuation.

TransGrid proposed network support as part of the Powering Sydney's Future project, which is considering the future electricity supply to the Sydney CBD and inner metropolitan area. TransGrid proposed pre-emptive network support to build up the market for network support in advance of the date network support was needed, as the amount of network support being sought was several times greater than that which had previously been successfully procured.

6.2 Summary of Draft Decision

In the draft decision, the AER used a base – step – trend approach to forecast the majority of operating expenditure. This approach was used for all operating expenditure categories except one.

The AER accepted TransGrid's operating expenditure in 2012/13 as efficient base year expenditure, and found no evidence of material inefficiency.[91] The AER was also of the view that TransGrid's operating expenditure profile over time is consistent with a business responding to incentives to reduce operating expenditure.[92] However, the AER did not reinstate expenditure for uncompleted easement maintenance in the base year.

The AER explicitly applied TransGrid's step decrease in expenditure for Sydney office accommodation, noting that it was a capex/opex trade-off. The AER accepted in principle the other two step decreases and two of the step increases in operating expenditure, but considered that the amounts they allowed for those step changes fell within the rate of change used in their model.

The AER forecast the operating expenditure trend based on the results of its opex partial factor productivity benchmarking. It rejected the use of an employee agreement to forecast

[91] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-31.
[92] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-32.

labour costs, and used an average of labour escalation forecasts from BIS Shrapnel and Deloitte Access Economics.

The AER used a bottom-up forecasting method for employer contributions to defined benefits superannuation, on the basis that these costs are forecast to decline after the base year. Inconsistently, it rejected the use of a bottom-up forecasting method for categories that are forecast to increase after the base year.

The AER rejected the proposed pre-emptive network support for the Powering Sydney's Future project, and expressed a view that it is not prudent to pre-emptively procure network support.

6.3 Response to Draft Decision

TransGrid is pleased that the AER accepted TransGrid's operating expenditure in 2012/13 as efficient base year expenditure, and expressed the view that TransGrid's operating expenditure profile over time is consistent with a business responding to incentives to reduce operating expenditure.

TransGrid notes that the AER has drawn on advice from Frontier Economics when applying its base – step – trend approach. However, the AER has applied the approach contrary to the advice from Frontier Economics by selecting one category of operating expenditure to be forecast using a bottom-up approach. TransGrid has obtained advice from Frontier Economics that its methodology has been applied inconsistently. Where the AER uses a base – step – trend approach, TransGrid considers that the AER has a particular obligation to substantiate that the costs forecast using this method would allow an NSP the efficient costs of meeting the operating expenditure objectives. This is because efficient future changes in a NSP's cost base are not necessarily reflected in a trend based on historical levels of expenditure.

TransGrid engaged HoustonKemp to evaluate the AER's operating expenditure partial factor productivity (PFP) benchmarking used to develop its forecast trend. HoustonKemp has found the benchmarking to be not fit for purpose for use in a revenue determination.

TransGrid agrees with the AER's identification of the step decrease in expenditure for Sydney office accommodation as a capex/opex trade-off. Inconsistently, the AER has not had regard in the draft decision to other capex/opex trade-offs that were clearly set out in TransGrid's revenue proposal. TransGrid is concerned by this selective consideration of capex/opex trade-offs.

TransGrid is also mindful that the Rules require it to submit an estimate of operating expenditure that reflects reasonable key assumptions, to be certified by the company directors. TransGrid does not consider that the AER's forecasting approach identifies or properly treats key assumptions.

TransGrid accepts the use of average of labour escalation forecasts from BIS Shrapnel and Deloitte Access Economics proposed by the AER, and has provided updated forecasts from BIS Shrapnel. This has reduced forecast labour escalation in this revised proposal, compared to the draft decision.

In this revised proposal, TransGrid has updated its operating expenditure forecast using its own forecasting methodology to incorporate the matters it has accepted from the AER's draft decision and the most recent information available. The forecast has been updated to incorporate:

- the most recent forecast of inflation, consistent with the AER's practice of using the most recent information at the time of a decision;
- the most recent forecast of labour escalation, adopting the AER's methodology of an average of the forecasts from BIS Shrapnel (updated in December 2014) and Deloitte Access Economics, as shown in Table 5.11;
- adjustments to the cost of step changes for:
  - consumer engagement, to reflect consumer sentiment for a modified program;
  - reductions to the demand management innovation program, given regulatory uncertainty in the 2014/15 year; and
  - an update to rental fees for radio repeater sites on Crown Lands, taking into consideration the most recent advice from the agencies that manage Crown Lands in New South Wales;
- removal of the adjustment for uncompleted easement maintenance in the base year, consistent with the draft decision;
- removal of network support;
- an update to network growth, to reflect the revised forecast capital expenditure; and
- the addition of operating expenditure for targeted pole replacement and pole reinforcement on two transmission lines, in conjunction with the removal of transmission line renewal projects for those lines as discussed in Section 5.5.3.

As a result of these amendments, forecast operating expenditure has reduced by approximately $34 million over the 2014/15 to 2017/18 period compared to the revenue proposal.

TransGrid also prepared an alternative forecast by updating the AER's forecast in the draft decision to correct for observed errors, remove inconsistencies and take account of the most recent information. TransGrid considers that the AER's operating expenditure forecast contains material errors because:

- the AER has applied base-step-trend forecasting and bottom-up forecasting inconsistently with its preferred methodology, as advised by Frontier Economics;[93]
- the partial factor productivity benchmarking used by the AER to determine a forecast trend does not effectively measure the efficiency of TNSPs against the operating expenditure objectives and is not fit for purpose, as advised by HoustonKemp;[94]
- HoustonKemp's analysis shows that the AER has applied a pre-emptive productivity trend based on benchmarking that is not fit for purpose;
- the AER has not included step changes in its estimate, ignoring reliable information as to future expenditure in favour of a productivity trend that HoustonKemp has found to be statistically unsound;
- the AER has not allowed expenditure to address the concerns of electricity consumers; and

[93] Frontier Economics, *Opex Forecasting Method*, December 2014.
[94] HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014.

- the AER has used a time lag when applying inflation to escalate the base year to June 2014 that is inappropriate given the purpose for which it is used.[95]

TransGrid updated the AER's operating model to:

- remove the lag applied to inflation;
- update labour escalation forecasts to incorporate the most recent forecast from BIS Shrapnel (applied as an average with the forecast from Deloitte Access Economics);
- remove the bottom-up forecast for defined benefits superannuation contributions;
- add step changes (both positive and negative), where these are not already taken into account in the AER's forecast rate of change; and
- add capex/opex trade-offs, consistent with the AER's comments in the draft decision.[96]

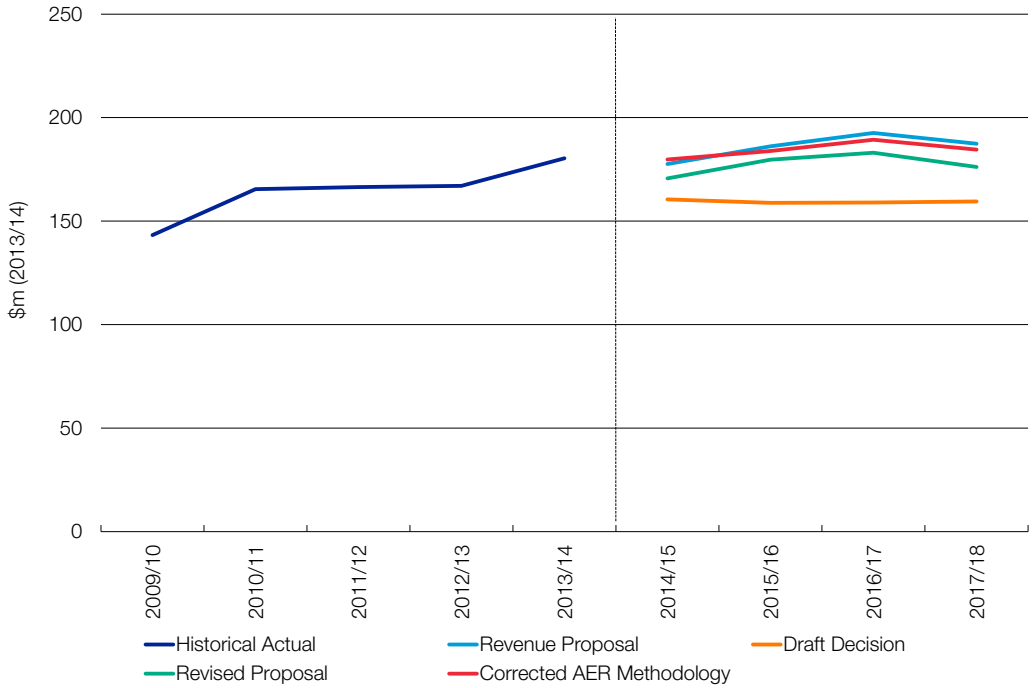
TransGrid also updated the productivity change and output change for estimates that incorporate data from the 2013/14 RIN responses. This is consistent with the AER's proposition that a longer data series leads to greater confidence in the results[97] and its intention to update the forecast operating expenditure for the most recent information in the final decision.[98] This time period also aligns with the AER's forecasting method, in which it applies the rate of change to estimated operating expenditure in the final year of the preceding regulatory control period.[99]

While this update does not address all of the issues with the AER's application of its approach, TransGrid has included it to indicate what the outcome of the AER's approach would be had the AER applied it consistently and with the most recent information.

A comparison of the forecast operating expenditure in TransGrid's revenue proposal, the AER's draft decision, this revised revenue proposal and the corrected AER methodology is provided in Figure 6.2.

[95] See advice from HoustonKemp in Appendix H.
[96] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-48.
[97] AER, *Explanatory Statement: Expenditure Forecast Assessment Guideline*, November 2013, p136.
[98] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-73.
[99] AER, *Expenditure Forecast Assessment Guideline for Electricity Transmission*, November 2013, pp22-23.

Figure 6.2
Comparison of Operating Expenditure Forecasts ($m 2013/14)



Source: TransGrid. Excludes debt raising costs.

As the forecast using the corrected AER methodology is above the revised forecast using TransGrid's methodology, TransGrid has proposed revised forecast operating expenditure based its own methodology in this revised revenue proposal, updated for the matters it has accepted from the AER's draft decision and the most recent information.

In discussions with consumers, some have raised the question of why TransGrid's operating expenditure cost does not decrease significantly given the forecast replacement expenditure over 2014/15 to 2017/18.

Based on the replacement expenditure proposed by TransGrid, the average age of its network would increase slightly over the next five years from 27.5 years to 27.9 years, as set out in the revenue proposal.[100] Importantly, the remainder of the network that is not being replaced (approximately 90%) will increase in age. That is, while new assets will incur a lower maintenance cost, other assets that will start to near the end of their lives over the next five years will incur increasing maintenance costs. To the extent that the age profile of the network remains similar, overall maintenance costs will remain similar. This is reflected in TransGrid's forecast operating expenditure.

A summary of the matters raised in the AER's draft decision and TransGrid's responses are shown in Table 6.2.

[100] TransGrid, *Revenue Proposal 2014/15 – 2018/19*, 2 June 2014, pp94-95.

Table 6.2
Summary of Matters Addressed in Revised Proposal

Matter	AER Draft Decision	TransGrid Response
Forecasting methodology	Rejected effort-based forecasts for maintenance Rejected bottom-up forecasts for major operating projects, insurance and long service leave but accepted bottom-up forecasts for defined benefits superannuation employer contributions	Bottom-up forecasting is the most appropriate forecasting method for non-recurrent expenditure The AER has applied its approach inconsistently with advice from Frontier Economics
Base year	Did not reinstate uncompleted easement maintenance	It is preferable to reinstate uncompleted easement maintenance, because the operating expenditure forecast will then more accurately reflect TransGrid's forecast costs However, TransGrid has used 2012/13 without the reinstatement as the base year due to constraints of the previous EBSS guideline
Determination of a forecast trend	Used operating expenditure PFP benchmarking	The partial factor productivity model is not fit for purpose If the AER uses PFP benchmarking to develop an alternative forecast in the final decision, it should extend the analysis to take account of the most recent information that includes 2013/14 RIN data TransGrid is using labour escalation and network growth with economies of scale
Step changes	Accepted step decreases Reduced step increases for guideline obligations and transfer of operating agreement Rejected other step increases Considered that step changes were taken into account within the productivity trend	TransGrid has included all step changes, as it considers that they are reasonably required to meet the efficient costs of providing transmission services
Labour escalation	Used average of forecasts from BIS Shrapnel and Deloitte Access Economics	Accept, and update to incorporate most recent forecasts from BIS Shrapnel

Table 6.2 (cont'd)
Summary of Matters Addressed in Revised Proposal

Matter	AER Draft Decision	TransGrid Response
Capex/opex trade-off	Accepted capex/opex trade-off for accommodation, but did not take into account other capex/opex trade-offs	There are capex/opex trade-offs in major operating projects that the AER has not taken into account TransGrid has used its bottom-up approach to major operating projects
Debt raising costs	Accepted debt raising transaction costs, and rejected liquidity costs and three month ahead financing costs	Efficient debt raising costs include debt raising transaction costs, liquidity costs and three month ahead financing costs
Inflation rate	Used a 15 month lag on inflation index	A 15 month lag on inflation is incorrect

6.4 Forecasting Methodology

In the revenue proposal, TransGrid forecast its operating expenditure using:

- a base – step – trend approach for categories that are recurrent in nature, for which historical expenditure provides a realistic expectation of forecast expenditure;
- a variation on the base – step – trend approach for routine and defect maintenance, based on forecast effort and base year rates; and
- a bottom-up approach for a small number of categories that are non-recurrent, such as those that comprise specific projects or where market rates provide the best expectation of forecast expenditure. These categories are:
  - major operating projects (MOPS);
  - insurance and self-insurance (although the forecast for self-insurance is zero);
  - long service leave entitlements;
  - defined benefits superannuation employer contributions;
  - network support; and
  - debt raising costs.

In the draft decision, the AER forecast its alternative estimate of operating expenditure using:

- a base – step – trend approach for most categories of operating expenditure; and
- a bottom-up approach for:
  - defined benefits superannuation employer contributions;
  - network support; and
  - debt raising costs.

TransGrid's approach and the AER's approach are broadly similar. The differences in approach are primarily in the allocation of costs between base – step – trend or bottom-up forecasting, and the approach to forecasting the trend.

TransGrid notes that its approach to forecasting routine and defect maintenance results in a similar forecast as under a base – step – trend approach. Consequently, TransGrid considers this difference in approach to be immaterial.

The AER has drawn on advice from Frontier Economics in support of its forecasting approach. However, the AER has not applied the approach advised by Frontier Economics consistently. TransGrid considers that:

- the AER's selective treatment of categories is inconsistent with the advice from Frontier Economics on which it relies in support of its approach; and
- the AER's test for recurrence, as well as being inconsistent with the advice from Frontier Economics, appears to be unsupported by analysis.

Inconsistency with Advice from Frontier Economics

In the draft decision, the AER stated that:

> Generally it is best to use the same forecasting method for all cost categories of opex because hybrid forecasting methods (that is, combining revealed cost and category specific methods) can produce biased opex forecasts inconsistent with the opex criteria. Using a category specific forecasting method for some opex categories may produce better forecasts of expenditure for those categories but this may not produce a better forecast of total opex. This view is consistent with the view expressed by Frontier Economics, which stated:
>
> > We consider that it would be inappropriate for the AER to review each component of controllable opex individually to see whether it conformed to the same pattern as overall controllable opex. Such 'cherry-picking' would likely result in aggregate controllable opex being systematically and inefficiently over-forecast.[101]

However, contrary to the view of Frontier Economics, the AER has reviewed components of controllable operating expenditure individually to see whether they conform to the same pattern as overall controllable operating expenditure.

In the draft decision, the AER stated that:

> Having established a broadly recurrent series of adjusted total opex, forecast total opex will systematically exceed the efficient level of opex if a category specific forecasting method is used to forecast opex categories:
>
> - with unusually low expenditure in the base year compared to other years, or
> - with a greater rate of change than total opex.[102]

However, the converse is also true. That is, forecast total operating expenditure will systematically understate the efficient level of operating expenditure if a category specific forecasting method is used to forecast categories:

- with unusually high expenditure in the base year compared to other years; or
- with a lesser rate of change than total operating expenditure.

[101] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-21 - 7-22.
[102] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-23.

TransGrid engaged Frontier Economics to assess TransGrid's forecasting methodology, assess the AER's forecasting methodology and provide advice on the most appropriate forecasting methodology for TransGrid's operating expenditure allowance for 2014/15 to 2018/19. Frontier Economics advised that there are advantages and disadvantages to both base – step – trend and bottom-up approaches.

In regard to the AER's forecasting approach, Frontier Economics advised that:

> In my view, the conditions for the appropriate application of a single year base-step-trend approach to forecasting total controllable opex appear to be broadly met in TransGrid's case.
>
> However, I disagree with the AER's approach of excluding categories of opex from base year expenditure on the basis of seeking to derive the most stable formulation of base opex. If TransGrid's opex is forecast using a base-step-trend approach, the base year expenditure should include MOPS, long-service leave and defined benefits superannuation payments.
>
> For the AER to exclude defined benefits superannuation payments on the basis that the historical path of residual opex is "much more stable" with it removed would be to engage in the same sort of 'cherry-picking' I warned against in my previous report for the AER. In my view, it is not relevant that the remainder of past opex is somewhat more stable with defined benefits superannuation expenses excluded. If total opex is broadly recurrent, then one should expect opex categories that rise over time to be more or less offset by opex categories that fall over time.[103]

TransGrid considers that if the AER uses the base – step – trend approach to develop an alternate estimate to which to compare TransGrid's forecast, it should apply the base – step – trend approach consistently across all categories of controllable operating expenditure, as advised by Frontier Economics.

The AER's Test for Recurrence is Subjective and Unsupported by Analysis

As well as being inconsistent with the advice from Frontier Economics, the AER's test for recurrence appears to be unsupported by analysis.

In the draft decision, the AER reviewed TransGrid's historical operating expenditure to determine whether it was broadly recurrent. The AER notes that TransGrid's historical operating expenditure displayed some volatility and claimed that this was driven by network support costs, movements in provisions and defined benefits superannuation costs.

TransGrid disagrees with the AER's attribution of the volatility in operating expenditure to defined benefits superannuation costs.

TransGrid undertook linear regressions of its historical controllable operating expenditure under 36 scenarios, with permutations of the following categories removed:[104]

- major operating projects;
- insurance;
- defined benefits superannuation contributions;
- long service leave;
- annual leave; and
- workers compensation.

[103] Frontier Economics, *Opex Forecasting Method*, December 2014, ppiii-iv.
[104] All scenarios were on a cash basis for employee entitlements, with network support and debt raising costs removed.

The results of the regression analysis show that:

- the best linear regression fit to TransGrid's historical controllable operating expenditure is with major operating projects and insurance removed;
- the second best fit is with only major operating projects removed;
- the third best fit is with only insurance removed; and
- the fourth best fit is with no categories removed.

The four scenarios are very close in terms of their fit.

The remaining 32 scenarios have a significantly worse fit, including the scenarios with defined benefits superannuation contributions removed. Hence, the AER's treatment of categories to achieve a recurrent series is contradicted by the results of the linear regression analysis and is therefore inappropriate.

6.5 Base Year

In the draft decision, the AER accepted TransGrid's operating expenditure in 2012/13 as efficient base year expenditure, finding no evidence of material inefficiency.[105] The AER was also of the view that TransGrid's operating expenditure profile over time is consistent with a business responding to incentives to reduce operating expenditure.[106]

The AER's use of actual expenditure in 2012/13 as the base year differs slightly from TransGrid's revenue proposal. In the revenue proposal, TransGrid advised that in 2012/13 it had responded to a significant issue with the safety performance of an easement maintenance contractor and terminated the contract. The time required to establish the new contract led to an unavoidable eight month break in easement maintenance in one region, and $2 million of easement maintenance was not completed in 2012/13.

TransGrid proposed to make an adjustment to reinstate the uncompleted maintenance, for the purpose of establishing an efficient base year. TransGrid also made a commensurate reduction to the 2012/13 savings under the efficiency benefit sharing scheme, to ensure no double-recovery of this adjustment.

In the draft decision, the AER did not accept this adjustment, stating that:

> We consider that the same effect can be realised in the opex forecast by retaining the base year and allowing the EBSS to account for the easement management underspend. Therefore we have used TranGrid's unadjusted 2012–13 opex as our base year opex for the purpose of estimating our alternative opex forecast.[107]

The AER also stated that:

> In the 2009–14 regulatory control period, TransGrid was subject to version one of the EBSS. This version of the EBSS does not allow for such an adjustment to the carryover amounts. We must be satisfied the actual opex accurately reflects the costs faced by the NSP during the regulatory control period. Including a cost that was not incurred into the regulatory control period in the EBSS calculations is not consistent with how the EBSS is intended to operate.[108]

[105] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-31.
[106] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-32.
[107] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-32.
[108] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 9 – Efficiency Benefit Sharing Scheme*, 27 November 2014, p9-13.

TransGrid notes that the difference between making and not making an adjustment to the base year to reinstate maintenance is immaterial to total revenue, and mainly results in a transfer between forecast operating expenditure and the efficiency carryover under the EBSS.

Despite this, TransGrid considers this to be a sub-optimum outcome.

If the EBSS efficiency carryover is used as a substitute for part of the operating expenditure forecast, as the AER in effect proposes, then the operating expenditure forecast itself does not reflect the efficient costs that a prudent operator would require to achieve the operating expenditure objectives. The implications of this can be significant, as TransGrid's actual operating expenditure over the 2014/15 to 2017/18 period will be measured against its allowance for operating expenditure in the AER's final decision, which would not include the partial substitute forecast within the EBSS efficiency carryover.

TransGrid understands that the flexibility to enable revenue to be shifted between the EBSS carryover and the operating expenditure allowance to account for non-recurrent efficiency gains in the base year does not exist in the version of the EBSS that applied to it in 2009/10 to 2013/14 regulatory control period.

Therefore, TransGrid accepts the use of 2012/13 without the adjustment to reinstate uncompleted easement maintenance as the base year. However, it considers that the AER then cannot regard its operating expenditure allowance as representing a level of efficient operating expenditure.

TransGrid remains concerned that the operating expenditure forecast itself is lower than the efficient costs and the potential for expenditure above the forecast to be incorrectly construed as inefficiency. TransGrid seeks confirmation from the AER that comparisons against its operating expenditure forecast over the 2014/15 to 2017/18 period will note that the forecast is lower than efficient costs, and that expenditure above the forecast does not necessarily infer inefficiency. TransGrid also notes that the full costs of easement maintenance should be reflected in the next base year (all else equal), which will be used to forecast operating expenditure for the regulatory control period starting in 2018/19.

6.6 Forecast Trend

The base – step – trend methodology allows for an estimate of a forecast trend to adjust costs from the base year to reflect expected price and cost changes in future years.

6.6.1 Determination of a Forecast Trend

The AER's approach to forecasting a trend for operating expenditure comprises three components:

- price change, which is a measure of how underlying prices are expected to change over time;
- output change, which is a measure of how the total quantity of a business' output is expected to change over time; and
- productivity change, which is a measure of how an industry's efficiency of production is assessed to change over time (usually measured as a ratio of outputs to inputs).

The AER has relied on benchmarking undertaken by its consultant, Economic Insights, in establishing its trend.

TransGrid has engaged HoustonKemp to provide expert advice on benchmarking of TNSPs and examine the robustness of the AER's benchmarking models.

HoustonKemp examined the AER's operating expenditure PFP benchmarking and identified three principal shortcomings with the AER's approach to forecasting the rate of change of operating expenditure:

- the forecasts depend on the same output weights underpinning the MTFP analysis, and so are not robust;
- the resultant opex forecasts are themselves not robust; and
- the forecasts of the productivity growth rate do not properly account for step changes.[109]

Therefore, HoustonKemp found that:

> It follows that the AER's estimates of the rate of change of opex are compromised, and so are not appropriate as a basis for setting TransGrid's opex allowance.[110]

Given this analysis, TransGrid considers that the AER's development of a forecast rate of change is not robust or fit for use in a revenue determination. TransGrid discusses the main components of the AER's rate of change and HoustonKemp's findings in the following sections.

The full report by HoustonKemp is attached as Appendix C.

Price Change

TransGrid and the AER have adopted similar approaches to determining the price change.

In the revenue proposal, TransGrid proposed price changes for:

- internal labour based on its employee agreement for the duration of the agreement, and the Wage Price Index (WPI) for the Electricity, Gas, Water and Waste Services (EGWWS) sector in New South Wales forecast by BIS Shrapnel thereafter;
- external labour based on the WPI for the EGWWS sector in New South Wales forecast by BIS Shrapnel;
- materials based on CPI; and
- insurance based on forecasts provided by TransGrid's insurance provider, SICorp.[111]

In the draft decision, the AER adopted a labour forecast for both internal and external labour based on the average of the BIS Shrapnel and Deloitte Access Economics EGWWS WPI. TransGrid agrees with the use of this forecast, and has provided an update to the BIS Shrapnel forecasts in Appendix D.

The AER has also adjusted forecasts for CPI.

The treatment of insurance forecasts is discussed in Section 6.4.

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[109] HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014, pp1-2.
[110] HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014, p2.
[111] The AER's draft decision incorrectly states that TransGrid has developed its forecast of changes in insurance premiums using advice from its consultant, Marsh. The advice from Marsh was used to demonstrate that TransGrid's insurance procured through SICorp is provided at a lower cost than is available in the commercial insurance market.

Output Change

A measure of output change is necessary to adjust base year costs for a different level of activity in future years. If a business is operating and maintaining a larger network in future years, it will require a larger operating expenditure allowance than in the base year to do this. Conversely, if the network was contracting it would require a lower allowance than in the base year (all else equal).

In the revenue proposal, TransGrid proposed a very modest output change to reflect the minimal growth expected in the network over the upcoming period. TransGrid also applied economies of scale to the network growth factor to reflect that most costs will change at a lesser rate than the growth of the network. This approach has been accepted by the AER in previous revenue determinations over many years, and is generally non-controversial.

In the draft decision, the AER forecast output change using the output change measures and weights from its MTFP analysis.

TransGrid does not consider that the outputs adopted by the AER closely reflect the outputs of TNSPs in the National Electricity Rules, as set out in Section 4.1.1. An example provided by the AER serves to highlight the issues with its output measures.

> For example, if the only output measure is maximum demand, a 10 per cent increase in maximum demand results in a 10 per cent increase in expenditure.[112]

Depending on the timing within a TNSP's investment cycle, a 10 per cent increase in maximum demand may not require any additional assets and therefore would not require additional operating expenditure. Conversely, it may require a significant investment in additional assets and a higher increase in expenditure.

Further, HoustonKemp has significant concerns with the MTFP benchmarking Economic Insights has developed for the AER that has been used to determine the output weights, as set out in Section 4.1.1.

Therefore, TransGrid does not consider that the output change measures and weights from the AER's MTFP analysis are suitable for use in determining forecast output change.

Productivity Change

A measure of productivity change captures the ability to "do more with less" over time as businesses identify and implement efficiency improvements and benefit from broader economy wide productivity improvements, such as IT and technology change.

In the revenue proposal, TransGrid applied productivity change through the economies of scale applied to network growth and step decreases in operating expenditure for efficiency improvements that would take effect during or after the base year. The step decreases are discussed in Section 0.

In the draft decision, the AER applied a productivity change based on its PFP benchmarking. The AER based the trend on a recommendation from its consultant, Economic Insights, to apply the historical industry average productivity trend.

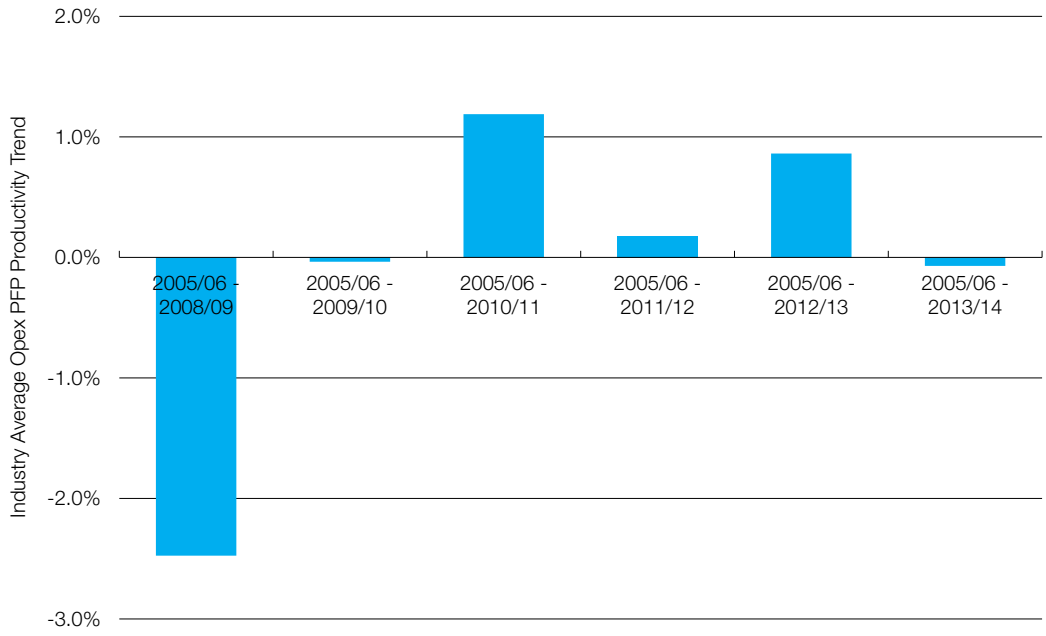
As discussed in Section 4.2, TransGrid does not consider the operating expenditure PFP benchmarking to be robust, or to provide a good measure of efficiency. The operating expenditure PFP benchmarking is subject to similar issues as MTFP benchmarking,

[112] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-67.

including exhibiting a high degree of uncertainty and significant sensitivity to changes in the model specification or source data.

To illustrate the level of variability inherent in the operating expenditure PFP, TransGrid has compared the industry operating expenditure PFP used by the AER over different time periods. This is shown in Figure 6.3.

Figure 6.3
Variability of Operating Expenditure PFP Over Different Time Periods



Source: TransGrid.

As is evident, the industry average annual operating expenditure PFP trend varies between –2.47% and +1.19% depending on the time period chosen. As applied to TransGrid's operating expenditure, together with the differences in output weights, this could result in a variance of between approximately +$58 million and –$9 million over 2014/15 to 2017/18, which is a material variance.

This clearly demonstrates the significant sensitivity that results in inconsistent, unreliable productivity measures which are inherent in the AER's PFP model. For this reason, TransGrid considers the modelling is not fit for purpose for use in a revenue determination.

6.7 Step Changes

In the revenue proposal, TransGrid proposed seven step changes in operating expenditure due to new obligations and social responsibilities. It also proposed three step decreases in operating expenditure due to efficiency improvements that would take effect during or after the base year.

In the draft decision, the AER accepted the largest negative step change, that is, a reduction in operating expenditure for Sydney office accommodation.

The AER also accepted the need for the other two negative step changes and three of TransGrid's proposed positive step changes:

- payroll efficiencies;
- Yass control room closure;
- rental fees for communication towers on Crown Lands;
- ongoing requirements arising from the AER's new regulatory guidelines; and
- transfer of AEMO system operator functions.

However, it reduced the costs for the latter two step changes.

The AER rejected four of TransGrid's proposed step changes:

- easement maintenance catch up after response to safety obligations and cost escalation;
- consumer engagement program;
- increase in demand management innovation allowance; and
- revenue reset.

Under the AER's forecasting method, it considered that the step changes it accepted were already compensated through the rate of change component of its operating expenditure forecast. HoustonKemp advised that:

> … we note that the AER's treatment of step-changes is predicated on the assumption that historical step changes are a sensible proxy for future step changes. In our opinion, they are not. The AER has ignored the specific information provided by TransGrid in relation to step changes and has instead relied on an estimate derived from a model that is compromised. In our opinion this approach does not represent regulatory best practice.[113]

HoustonKemp further stated that:

> By definition, step changes are factors that are incorporated into forecasts on a case-by-case basis. Put another way, step changes are one-off events that give rise to a discontinuity in the prevailing trend. In our opinion, the link between historical and future step changes is at best tenuous, and at worst non-existent.[114]

Therefore, TransGrid has rejected the AER's approach which regards step changes as being compensated for in the productivity trend, and continued to use its approach of identifying step changes for inclusion in the operating expenditure forecast on a case by case basis.

Further, TransGrid does not accept the AER's reduced costs for two of the step changes or the AER's rejection of four proposed step changes, for the reasons set out as follows.

6.7.1 Rental Fees for Communication Towers on Crown Lands

In July 2013, the Independent Pricing and Regulatory Tribunal (IPART) completed a review into rental fees for Crown Land communication tower sites in New South Wales. The review included an update to the rental fee schedule. This step change comprises the increase in rental fees arising from the update to the rental fee schedule.

[113] HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014, p2.
[114] HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014, p22.

In the draft decision, the AER considered that the increase in rental fees is a price increase, and that the price increase would be compensated through the rate of change component of its operating expenditure forecast.

TransGrid does not consider that this price increase is compensated through the rate of change component. The increase in rental fees for communication towers on crown lands is forecast to be 43% in 2014/15, followed by 9% on average annually for the next three years. TransGrid considers that this is well outside the usual variations in price change, and is an uncontrollable change.

TransGrid has included this step change in the operating expenditure forecast in this revised proposal. It has updated the costs to reflect updated advice on costs from the agencies that manage Crown Lands in New South Wales in November 2014.

The forecast of this step change and annual impact on a typical residential consumer bill are shown in Table 6.3.

Table 6.3
Forecast of Crown Lands Step Change ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	0.1	0.1	0.1	0.2
Annual impact on typical residential bill relative to 2012/13	2 cents	2 cents	2 cents	3 cents

Source: TransGrid.

6.7.2 Ongoing Requirements Arising from the AER's New Regulatory Guidelines

In late 2013, the AER published seven new guidelines, as required by the AEMC's *Economic Regulation of Network Service Providers* rule change in November 2012.

The new guidelines and associated regulatory information instruments impose significant and ongoing information provision requirements on transmission network service providers, well in excess of those under the AER's previous guidelines and regulatory approach.

TransGrid has incurred, without compensation, the cost of the initial responses to the information requests in 2013/14, as these were required to be prepared and lodged concurrently with the revenue proposal. However, the significant effort required to comply with the AER's extensive information requirements has caused a step increase in costs for TransGrid.

In the draft decision, the AER accepted the need for a step change but considered that TransGrid's proposed internal labour rates and hours and auditing costs were higher than those proposed by other businesses. It compared TransGrid's proposed costs to those of ActewAGL, Jemena Gas Networks (proxying Jemena electricity network costs) and TasNetworks. It then scaled TransGrid's proposed costs to the average of the three business' step changes, stating that:

> In relation to the additional costs for completing the economic benchmarking and category analysis RINs, we consider that as a larger business TransGrid should have the systems in place to better deal with the new requirements than the other smaller businesses. Applying the average

of the other businesses' data as a benchmark, we consider that TransGrid's expenditure should be no higher than $266,603 per year.[115]

TransGrid does not accept the AER's rationale or substitute estimate. TransGrid is between two and seven times the size of the businesses to which the AER has compared it, using RAB as an indicator of the size and scale of the business assets and activities. TransGrid considers that if the AER seeks to benchmark costs, it must take account of differences between networks due to factors such as scale.

The information requirements imposed by the AER are significant, have definitions that differ from those used in normal business reporting, and were introduced in a very short timeframe concurrent with the preparation and lodgement of TransGrid's revenue proposal. Therefore, TransGrid considers that it is unreasonable for the AER to assume it would have established systems to automate the compilation of data for the RINs. Further, TransGrid does not accept the proposition that as a larger business it should have the systems in place to better deal with the new requirements than the other smaller businesses.

TransGrid notes that the allowance the AER has proposed for this step change would barely cover the external, competitively sourced, audit costs for the RINs. TransGrid has provided invoices for the audits of the October 2014 RIN responses as supporting information to this revised revenue proposal, to provide evidence of these costs.

TransGrid has therefore included its original estimate for this step change in the operating expenditure forecast in this revised proposal.

The forecast of this step change and annual impact on a typical residential consumer bill are shown in Table 6.4.

Table 6.4
Forecast of Regulatory Guidelines Step Change ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	0.6	0.6	0.6	0.6
Annual impact on typical residential bill relative to 2012/13	12 cents	12 cents	12 cents	12 cents

Source: TransGrid.

6.7.3 Transfer of AEMO System Operator Functions

Since 2004, TransGrid has had an operating agreement in place with AEMO, under which AEMO delegated a number of its functions to TransGrid as a system operator in New South Wales. TransGrid has provided this service to AEMO as a non-regulated activity.

In January 2014, the operating agreement concluded and AEMO and TransGrid established an instrument of delegation under Clause 4.3.3 of the National Electricity Rules. The instrument of delegation sets out the functions AEMO delegates to TransGrid, which are provided as prescribed services to meet the obligations delegated to TransGrid under Clause 4.3.3.

This step change comprises the costs for the provision of TransGrid's prescribed functions as a system operator under the instrument of delegation.

[115] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-52.

In the draft decision, the AER accepted the need for a step change but disputed the cost proposed by TransGrid for this service.

In particular, the AER expressed the opinion that the AEMO operating agreement was, "not competitively determined, negotiated or reviewed".[116] This is incorrect. In relation to the last two operating agreements, TransGrid has entered into extended negotiations with AEMO, in which AEMO carefully reviewed every detail of the service offered and the price charged. AEMO's policy required them to negotiate a "best value" deal, with the fall-back position that they would take the service in-house. In both negotiations, AEMO chose to continue with an agreement with TransGrid. The value of the step change proposed was the same as the service paid for by AEMO after extensive negotiations over multiple contract renewals. The AER should place reliance on AEMO as having substantiated value for money for the provision of this service. Importantly, while AEMO could have chosen to take this in-house, it continued to procure the service from TransGrid as it represented better value. While not quite constituting an "open tender" process, it nevertheless:

- required TransGrid to represent a better value option than AEMO could offer;
- was established through extensive negotiation with AEMO, an informed and experienced entity capable of assessing the difference in operating conditions between a large network such as TransGrid and a smaller, simpler network such as Transend; and
- was subject to rigorous review each time the agreement was renegotiated.

Further, the AER benchmarked TransGrid's proposed cost for the step change against TasNetworks, the smallest TNSP in the NEM, without consideration of the differences between the two networks. TransGrid does not consider this comparison to be valid. TransGrid operates a significantly larger and more complex interconnected transmission network than TasNetworks, with around six times the energy consumption, twice the number of substations (nearly all of which are larger than TasNetworks' substations) and 10 times the number of network constraints in AEMO's market data systems. The comparison of the costs of operating these networks compares the two most different transmission networks in the NEM.

The indicative impact of this on duties covered under the Instrument of Delegation can be demonstrated by two examples:

1. load shedding: TransGrid operates a network with a peak demand of approximately 12,000 MW, as compared to TasNetworks' peak demand of 2,000 MW. TransGrid also coordinates load shedding with four DNSPs, as compared to one DNSP which is now within TasNetworks. The procedures to shed larger loads and coordinate across more DNSPs will necessarily be more complex, and have a higher cost. In addition, TransGrid also carries out regular coordination exercises with DNSPs to ensure workability of the load shedding procedures; and
2. indirect oversight responsibilities: Under the previous AEMO Operating Agreement, TransGrid had indirect oversight over 78 substations, as compared to TasNetworks' 45 substations. Many of TasNetworks' substations are small in comparison to TransGrid's substations.

Managing a larger, more interconnected and complex network inevitably has a higher cost.

[116] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-53.

For the reasons highlighted above, TransGrid disagrees with the AER's premise that:

> The AEMO delegated functions are substantially the same for TransGrid and TasNetworks. Common across both networks is that the AEMO delegated functions are a marginal increment over the functions already required to be undertaken by the business in operating its own network. While there may be some cost differences associated with differences in network complexity and scale. We consider that the cost differences for the marginal additional work are minimal.[117]

TransGrid does not consider that the substitute estimate would allow it to recover the efficient costs of providing this function. Therefore, TransGrid has included its original estimate for this step change in the operating expenditure forecast in this revised proposal.

The forecast of this step change and annual impact on a typical residential consumer bill are shown in Table 6.5.

Table 6.5
Forecast of Operating Agreement Step Change ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	0.9	0.9	0.9	0.9
Annual impact on typical residential bill relative to 2012/13	Zero, as this is a transfer of costs between AEMO and TransGrid			

Source: TransGrid.

6.7.4 Easement Maintenance

An easement is the corridor of land along which a transmission line runs. Easement maintenance refers to the clearing and trimming of vegetation under and around transmission lines and structures, including maintenance of access tracks, to ensure staff are able to access the transmission line when required for maintenance and incident response.

Easement maintenance ensures that vegetation is kept below the height that could encroach on transmission line conductors. It maintains the reliability of the network by avoiding interruptions to transmission line availability, and significantly reduces the risk of starting a bushfire.

There are a number of inherent hazards associated with easement maintenance work. TransGrid's easements that require vegetation management are generally over steep and uneven terrain, including the Snowy Mountains, Blue Mountains, and other national parks. Vegetation clearing requires workers to use chainsaws, brushcutters and machinery to manage the vegetation within strict environmental constraints. Because of the significant hazards, effective work health and safety practices are paramount while undertaking these activities. TransGrid does not compromise on the safety of its workers or contractors.

In 2012/13, TransGrid responded to a significant issue with the safety performance of an easement maintenance contractor. This led to an eight month break in easement maintenance in one region, and additional expenditure has been included over the subsequent three years to catch up on this essential activity.

[117] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-54.

This step change includes additional expenditure in 2014/15 and 2015/16 to allow the catch up to be completed over the routine easement maintenance cycle.

In addition to the catch up work, there are three cost drivers that have led to a slight increase in easement maintenance costs going forward: work health and safety legislation, vegetation contract rates and community expectations.

In the draft decision, the AER rejected this step change on the basis that it considered the expenditure to be normal variations in business as usual activities or expenditure that is captured in the price change forecast.

However, in a regulatory framework that provides incentives to reduce costs over time, it is important that businesses which respond to incentives to reduce costs are allowed the costs of meeting prudent obligations when costs arise that are additional to their revealed costs. The disallowance of such costs would dilute the incentives in the regulatory framework to reduce costs.

TransGrid does not consider that additional expenditure to catch up on easement maintenance is a normal variation in business as usual activities. The break in easement maintenance is a material change in business activity and costs, which presents a significant challenge for the business. TransGrid was aware of the broader financial impact of the decision, given it occurred in the base year. However, TransGrid was obliged to put the safety of all persons working for it first and should not be penalised for this.

TransGrid considers that catching up on the maintenance over three years is more efficient than catching up on the maintenance over one year, as it can be managed in conjunction with normal easement maintenance cycles, aside from interim maintenance to address “danger trees”.

Therefore, TransGrid has included its original estimate for this step change in the operating expenditure forecast in this revised proposal.

The forecast of this step change and annual impact on a typical residential consumer bill are shown in Table 6.6.

Table 6.6
Forecast of Easement Maintenance Step Change ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	2.5	1.7	0.2	0.3
Annual impact on typical residential bill relative to 2012/13	48 cents	33 cents	3 cents	5 cents

Source: TransGrid.

6.7.5 Consumer Engagement Program

TransGrid has committed to a stakeholder engagement process that is proactive, transparent and underpinned by a genuine desire to inform, consult and collaborate effectively with interested parties. TransGrid has traditionally taken a low key approach to engaging with the general public and has instead focused on communicating with customers and communities impacted directly by specific capital projects.

Research has shown that this model is no longer relevant to today's environment and that TransGrid needs to be openly accountable for its share of the end users' bill, albeit small in most cases.

The value of greater engagement with consumers has also been highlighted in recent changes to the regulatory framework. In its *Economic Regulation of Network Service Providers* rule change, the AEMC stated:

> The Commission considers that the consultation process in the regulatory determination process that will apply in the NER is the minimum that would be required. The Commission encourages greater engagement and interaction between the NSP and consumer representative groups, and the NSP and the AER outside of the formal regulatory determination process set out in the NER.[118]

Further, the AER's *Consumer Engagement Guideline* places higher expectations on network service providers to consult with consumers.

In response to these changes in consumer interest and the expectations in the AER's guideline, TransGrid proposed to expand the resources allocated to effective stakeholder engagement. The initiatives were set out in detail in a Stakeholder Engagement Plan in Appendix S to the revenue proposal.

In the draft decision, the AER rejected this step change on the basis that:

> … we do not consider the changed regulatory obligation would materially increase costs above the base opex of an efficient and prudent service provider. Even without the rule change, we would expect a prudent service provider would have programs in place to engage with consumers. For instance, we would expect that a transmission network service provider would already be engaging closely with relevant consumers as part of its reset process to help understand their preferences around prices, reliability and service standards. Indeed, TransGrid stated it was able to propose potential capex savings in direct response to its consumer engagement on its revenue proposals.[119]

Whether or not the changed obligation would materially increase costs above the base operating expenditure of a service provider that already had programs in place to engage with consumers is not relevant to the AER's consideration of this step change. This is because the step change is in relation to TransGrid's operating expenditure, and not the operating expenditure of any other firm.

TransGrid's base operating expenditure includes the efficient costs of its engagement at the time, which was with:

- its direct customers (four directly connected industrial consumers, four distribution networks and 16 generators);
- communities directly affected by its projects; and
- a limited number of other stakeholders such as government and statutory bodies.

Irrespective of the AER's or other stakeholders' opinions as to whether TransGrid *should have* been engaging more broadly in its base year, it *was not*, and therefore the costs of broader consumer engagement are not present in its base year operating expenditure.

The new obligation to engage more broadly with consumers beyond TransGrid's directly connected customers is clear in the AER's *Consumer Engagement Guideline*:

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[118] AEMC, *Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p ix.
[119] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, pp7-56 - 7-57.

> We intend to apply the guideline to all electricity and gas transmission and distribution network service providers (service providers), who must act in the long term interests of consumers. The guideline states our expectations of how service providers engage with their consumers – that is, their 'end users'.[120]

Similarly, the guideline includes a statement by the then Chair of the AER that:

> We do not think the businesses can effectively engage around their network proposals if they do not engage effectively more broadly.[121]

This clearly affirms the AER's expectation that network service providers will increase their engagement activities compared to the extent of their activities prior to the publication of the guideline.

Further, a number of the elements in the guideline clearly require an allocation of additional resources. For example. in the guideline, the AER expects service providers to:

- investigate and use a range of methods and mediums to communicate with consumers, having regard to their engagement preferences;
- develop tailored and appropriate consumer engagement activities and mechanisms for delivery; and
- recognise adequate time and resources are necessary for all consumers to engage effectively.[122]

These activities are not costless.

The AER itself has committed additional processes and resources to establish its consumer challenge panel and state-based consumer focus groups to provide input into its decision making. It received additional funding in the 2013/14 Federal Budget for these activities.[123]

TransGrid has gained significant value from the consumer engagement it has undertaken to date and has incorporated feedback from consumers into this revised revenue proposal, as discussed in Chapter 3. Similarly, in feedback on some of TransGrid's forums and workshops, consumers have expressed a desire for continued engagement. However, it would be challenging to provide this engagement without appropriate funding.

Therefore, TransGrid has included an estimate for this step change in the operating expenditure forecast in this revised proposal. TransGrid has taken on board feedback about the scope of its proposed activities, and has made a reduction to the scope compared to its revenue proposal. The new scope of TransGrid's proposed consumer engagement activities is set out in Appendix K.

The forecast of this step change and annual impact on a typical residential consumer bill are shown in Table 6.7.

[120] AER, *Consumer Engagement Guideline for Network Service Providers*, November 2013, p4.
[121] AER, *Consumer Engagement Guideline for Network Service Providers*, November 2013, p12.
[122] AER, *Consumer Engagement Guideline for Network Service Providers*, November 2013, pp8-11.
[123] The Commonwealth of Australia, *Budget Paper No. 2, Budget Measures 2013-14*, 14 May 2013, p266.

Table 6.7
Forecast of Consumer Engagement Step Change ($2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast ($m)	1.7	1.6	1.6	1.7
Annual impact on typical residential bill relative to 2012/13	33 cents	32 cents	32 cents	33 cents

Source: TransGrid.

6.7.6 Increase in Demand Management Innovation Allowance

In the 2009/10 to 2013/14 regulatory control period, TransGrid had a demand management innovation allowance of $1 million per year. It used this allowance to undertake a broad range of projects, partnering with universities to understand consumer behaviour and distribution businesses to test broad-based demand management projects with residential consumers and small and medium businesses. TransGrid also developed its own demand management project, iDemand, to educate consumers about the importance of reducing peak demand and contribute to wider demand management research.

TransGrid is seeking to build on its foundational demand management innovation work, proposing an increase in the demand management innovation allowance for 2014/15 to 2017/18 to develop the demand management market and provide greater benefit to consumers. The allowance is intended for activities that will work towards the following key objectives:

- facilitate a flexible demand management marketplace;
- develop and grow the demand management market;
- pinpoint key drivers of peak demand in New South Wales in order to better source demand response;
- understand the electricity use and behaviour of large consumers, in order to surface their potential to provide demand management;
- test and apply large scale demand management tools and techniques; and
- identify and leverage the transmission-specific contribution to the demand management ecosystem.

In the draft decision, the AER rejected the step change to increase the demand management innovation allowance on the basis that it was not presented as a capex/opex trade-off or the result of a new regulatory obligation.

However, the operating expenditure factors in the Rules require the AER to have regard to expenditure to address the concerns of electricity consumers.[124]

At TransGrid's recent workshop on the draft decision and demand management innovation forum, consumer representatives expressed overwhelming support for TransGrid to pursue activities that would develop the demand management market.

Therefore, TransGrid has included an estimate for this step change in the operating expenditure forecast in this revised proposal. TransGrid has reduced the forecast expenditure in 2014/15 as it has not yet commenced the activities that would be funded by

[124] *National Electricity Rules*, Clause 6A.6.6(e)(5A).

the increase in the allowance, due to uncertainty around whether the AER would approve the additional allowance.

The forecast of this step change and annual impact on a typical residential consumer bill are shown in Table 6.8.

Table 6.8
Forecast of Demand Management Innovation Step Change ($m 2013/14)

	2014/15	2015/16	2016/17	2017/18
Forecast	-0.1	3.5	3.5	3.5
Annual impact on typical residential bill relative to 2012/13	-2 cents	67 cents	67 cents	67 cents

Source: TransGrid.

6.7.7 Revenue Reset

In the revenue proposal, TransGrid proposed a step change for revenue reset activities, which by their nature are a periodic expense. This comprised removal of revenue reset costs in the period between successive resets, and reinstatement of the costs in the years in which they are required.

The reinstated costs for the next revenue reset are forecast to be slightly higher than the base year costs, due to the more stringent information requirements in the AER's revenue reset RIN compared to the former *Submission Guidelines*.

In the draft decision, the AER rejected this step change as it considered expenditure on revenue reset activities to be a business as usual expense.

> Expenditure for the purposes of preparing a revenue proposal is a business as usual expense. It is not a change in expenditure which is attributable to a change in the business' operating environment or in a legislative or regulatory obligation. We consider that the base year provides the most reliable forecast of recurrent opex, including expenditure for the preparation of TransGrid's revenue proposal.[125]

However, this statement ignores the additional regulatory obligations created by the AER's revenue reset RIN compared to the former *Submission Guidelines*. It also ignores the additional obligations that relate to a revenue reset created by the AER's new guidelines published in 2013, such as the *Confidentiality Guideline*.

Prior to 2014, TransGrid was subject to the AER's *Submission Guidelines*, and had not been issued a Regulatory Information Notice (RIN) relating to a revenue reset. Following the *Economic Regulation of Network Service Providers* rule change in 2012, the *Submission Guidelines* no longer apply. However, in 2014 the AER issued a revenue reset RIN to TransGrid to gather information relating to the current revenue reset.

The more stringent information requirements considered in this step change are those introduced by the revenue reset RIN that were not previously in the *Submission Guidelines*. As the revenue reset RIN is a regulatory obligation, TransGrid considers that the incremental cost to meet its requirements does, in fact, constitute a step change.

[125] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, pp7-62.

Therefore, TransGrid has included its original estimate for this step change in the operating expenditure forecast in this revised proposal.

The costs included in this step change are those required to provide information in relation to a revenue reset, and exclude costs relating to the information to be provided annually under the RIN. (The costs relating to information required to be provided annually are included separately in the step change for "Ongoing requirements arising from the AER's new regulatory guidelines" discussed in Section 6.7.2.)

An estimate of the costs associated with meeting these information requirements, based on TransGrid's experience responding to the Revenue Reset RIN in 2014, is shown in Table 6.9. In the step change, TransGrid has spread these costs over two years in the lead-up to the submission of its next revenue proposal.

Table 6.9
Additional Costs Associated with New Information Requirements

RIN Reference	Information Requirement	Estimated Cost
Schedule 1 – 1.2 Schedule 2 – 1.2 Appendix E – 1.7 & 3	Basis of preparation	$31k
Schedule 1 – 1.5 (c)	Top 10 contracts (including review, highlighting and redaction for public and confidential versions as required by the Confidentiality Guideline)	$23k
Schedule 1 – 1.5 (d)	References of RIN requirements to revenue proposal and pricing methodology	$4k
Schedule 1 – 4.3	Derivation of items of forecast capital expenditure	$4k
Schedule 1 – 4.4	Documents supporting deliverability	$4k
Schedule 1 – 5	Information for the repex model	$8k
Schedule 1 – 6 Appendix E – 8	Demand forecasts	$15k
Schedule 1 – 8.2-8.5	Insurance	$4k
Schedule 1 – 10	Provisions	$15k
Schedule 1 – 16.3	Network capability component	$31k
Schedule 1 – 23.2	Overview paper	$8k
Schedule 1 – 26	Audit reports	$31k
Schedule 1 – 29	Confidential information (including review, highlighting and redaction for public and confidential versions of supporting documents as required by the Confidentiality Guideline – except for top 10 contracts which is included above)	$31k
Appendix E – 1.14	Reporting requirements for overheads	$8k
Appendix E – 4	Forecast labour cost information	$8k

Table 6.9 (cont'd)
Additional Costs Associated with New Information Requirements

RIN Reference	Information Requirement	Estimated Cost
Appendix E – 5 & 6	Forecast replacement capital expenditure and asset age profile	$15k
Appendix E – 7	Forecast augex project data	$8k
Appendix E – 9	Forecast non-network expenditure	$15k
Appendix E – 10	Forecast maintenance expenditure	$8k
Appendix E – 11	Forecast vegetation management expenditure	$4k
Appendix E – 12	Forecast overhead expenditure	$8k
Templates – 6.1 & 6.3	Policies, procedures & obligations	$8k
General	Co-ordination	$46k
	Total	**$336k**

Source: TransGrid. Totals may not add due to rounding.

6.7.8 Step Decreases

In the revenue proposal, TransGrid proposed three step decreases in operating expenditure for efficiency improvements that would take effect during or after the base year. As the cost savings realised by these efficiencies were not already included in base year costs, TransGrid removed them from base year costs.

The step decreases in operating expenditure were for:

- a change to Sydney office accommodation;
- efficiencies in payroll processing; and
- closure of Yass control room.

The AER accepted all three step decreases in operating expenditure. The AER noted that the change to Sydney office accommodation is a capex/opex trade-off and considered that the remaining two are already taken into account through the rate of change component of its operating expenditure forecast.

TransGrid has included these step decreases in the operating expenditure forecast in this revised proposal.

6.8 Major Operating Projects

Major operating projects (MOPS) comprise refurbishment and small replacement projects that do not meet the definition of capital expenditure. They are more similar in nature to capital projects than operating expenditure and tend to be "lumpy" rather than recurrent in nature.

In the revenue proposal, TransGrid proposed a bottom-up forecast of MOPS because an alternative approach, to use a trend based on historical expenditure, would be less well suited to taking into account the "lumpy" nature of the expenditure and distinct needs that

drive it. Therefore, a trend based forecasting approach may under or over forecast the efficient costs required to meet the operating expenditure objectives.

In the draft decision, the AER incorporated MOPS into its base – step – trend forecast, rather than using a bottom-up forecast, on the basis that:

> Using a category specific forecasting method for some opex categories may produce better forecasts of expenditure for those categories but this may not produce a better forecast of total opex.[126]

The AER referenced the view of Frontier Economics that if overall controllable operating expenditure is broadly recurrent, a base – step – trend approach to forecasting would be appropriate.

However, TransGrid notes that the AER has not applied this advice from Frontier Economics consistently in the draft decision, as outlined in Section 6.4.

If the AER applies the approach advised by Frontier Economics consistently to overall controllable expenditure, TransGrid accepts the inclusion of MOPS within that overall approach. Otherwise, TransGrid maintains that a bottom-up forecasting approach is the most suitable approach to forecast MOPS.

In its draft decision, the AER stated that:

> One situation where a step change may be required is when a service provider chooses an operating solution to replace a capital one. For example, it may choose to lease vehicles when it previously purchased them. For these capex/opex trade-off step changes, we assess whether it is prudent and efficient to substitute capex for opex or vice versa. In doing so we assess whether the forecast opex over the life of the alternative capital solution is less than the capex in NPV terms.[127]

This concurs with the advice provided by Frontier Economics, which states that:

> To provide incentives for TNSPs to adopt efficient part-capex and part-opex options under a base-step-trend forecasting approach, the AER should augment the network business's capex allowance and also incorporate the additional opex required for the option as a step change in the business's opex allowance.[128]

TransGrid notes that its MOPS forecast in the revenue proposal included specific trade-offs between capital and operating expenditure that were not present in its historical costs. Therefore, TransGrid proposes that if the AER uses a base – step – trend approach to forecasting MOPS in its alternative forecast, these projects should be included separately in the forecast. TransGrid has included three MOPS projects that have specifically arisen from capex/opex trade-offs in its update to the AER's forecast:

- the decommissioning, rather than rebuild, of a 132kV transmission line in the Central West of NSW;
- the decommissioning, rather than replacement, of an equipment monitoring system at Haymarket; and
- targeted pole replacement and reinforcement on two 132kV transmission lines as suggested by EMCa in its review of forecast replacement expenditure.

[126] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, pp7-22.
[127] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, pp7-48.
[128] Frontier Economics, *Opex Forecasting Method*, December 2014, p iv.

6.9 Debt Raising Costs

In the revenue proposal, TransGrid proposed debt raising costs of 20.2 basis points. The costs were assessed by economic advisors, Incenta, based on TransGrid's post-tax revenue model numbers and using Standard & Poor's methodology.

TransGrid has confirmed through discussions with three separate investment banks[129] that Standard & Poor's methodology reflects the minimum benchmark that a commercial business would apply when managing its debt. In practice, commercial businesses would refinance earlier than three months ahead and hold a larger liquidity reserve, so in effect, Incenta's calculation of these debt management costs is conservative. Nevertheless the methodology offers the AER a transparent and useful framework with which to assess these costs.

TransGrid's approach to estimating debt raising costs was presented in Chapter 6 of TransGrid's revenue proposal. This was supported by the Incenta Economic Consulting report *Debt Raising Transaction Cost* in Appendix U of the revenue proposal. TransGrid maintains in this revised proposal that this is the appropriate approach.

In the draft decision, the AER has:

- accepted the methodology to calculate the debt raising transaction costs, however made changes to TransGrid's projected RAB and the forecast WACC;
- rejected the liquidity costs; and
- rejected the three month ahead financing.

The AER has rejected the proposed liquidity costs and three month ahead financing on the basis that:

1. the PTRM's timing assumptions already implicitly provides a favourable allowance, hence there is no need for an additional allowance to provide liquidity, or to compensate for the timing of financing;
2. Ausgrid, Endeavour Energy, Essential Energy, TasNetworks and Directlink did not include these costs in their revenue proposals; and
3. there would be an added complexity in estimating the debt raising costs given the modelling and data requirements to estimate these two additional categories.

TransGrid acknowledges the AER's acceptance of the calculation methodology to debt raising transaction cost. In this revised proposal, the calculation has been updated based on the revised forecast RAB and TransGrid's proposed WACC, resulting in a small reduction in this cost.

TransGrid does not agree with the AER's decision to reject the liquidity costs and the three month ahead financing and maintains that these are efficient costs. The AER's justification is not consistent with the Rules requirements. The AER has offered no technical basis for not accepting the proposal.

Clause 6A.6.6(c) of the Rules requires that the AER must accept the forecast of required operating expenditure of a Transmission Network Service Provider that is included in a Revenue Proposal if the AER is satisfied that the total of the forecast operating expenditure for the regulatory control period reasonably reflects each of the following (the operating expenditure criteria):

[129] Westpac, Deutsche Bank and NSW TCorp.

1. The efficient costs of achieving the operating expenditure objectives
2. The costs that a prudent operator would require to achieve the operating expenditure objectives
3. A realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives.

The AER is required to assess the forecast operating expenditure based on the operating expenditure criteria. The AER's reasons in the draft decision do not demonstrate that it has sufficiently investigated and assessed TransGrid's proposal against these criteria. The Rules do not provide any scope to consider the implications of how the PTRM has been constructed in the AER's assessment of efficient operating expenditure, nor do they allow the AER to deny efficient costs merely because some other businesses have not proposed such costs. Neither TransGrid nor the AER is in a position to speculate on why some businesses have not included these costs in their estimates, but at any rate this would merely be a distraction from the task of assessing whether these costs meet the operating expenditure criteria.

TransGrid has sought clarification from Ashurst, a law firm with experts specialising in electricity regulation. Ashurst agree that the AER's justification to reject these costs has no basis under the Rules.

> Our understanding of the Incenta report relied on by TransGrid is that the Relevant Debt Raising Costs cannot be avoided by a prudent operator. The AER has not provided any evidence that contradicts Incenta's statement of expert opinion. Whether other network service providers have claimed these costs or any increase in the complexity of the estimation do not address the issue of whether a prudent operator would have incurred them as the AER is required to consider under the NER.
>
> ...
>
> ... it is not clear why this is relevant to the assessment under the NER given that the claimed overcompensation from the post tax revenue model is not considered in clause 6A.6.6 of the NER. As such, the AER cannot rely on this claimed overcompensation when determining TransGrid's allowed operating expenditure.[130]

The AER's claim of complexity in calculating the liquidity costs and the three month ahead finance is incorrect, even if this was reasonable grounds to reject the costs. As detailed by Incenta in its response to the AER's decision, the calculations are far less complex than those of the debt raising transaction costs which the AER has undertaken for a number of regulatory control periods.

In this revised proposal, TransGrid has updated the estimate for:

- updates to the post-tax revenue model numbers reflected in this revised proposal;
- the discount rate used in the debt raising transaction costs to address AER concerns; and
- the cost of three month ahead financing, to reflect short term rather than trailing average costs, to address AER concerns.

The resultant updates in the cost estimates are:

- 9.4 basis points for the costs of issuing the bonds in an assumed debt portfolio of $3.65 billion (that is, RAB debt);

[130] Ashurst Australia, *Letter to TransGrid on AER Draft Determination - Debt Raising Cost*, 12 January 2015.

- 4.2 basis points to establish a bank facility for, and pay commitment fees on, undrawn committed bank lines in order to satisfy Standard & Poor's liquidity requirement (that is, achieving a liquidity ratio of at least 1.1 times, and ensuring that forecast cash sources are equal to cash uses over a six month horizon in the event of a 15% decline in EBITDA); and
- 4.4 basis points to compensate for the fact that Standard & Poor's requires businesses to refinance debt three months ahead of the actual refinancing date.

A more detailed discussion of the basis of the calculations is included in Appendix U, Debt Raising Transaction Costs, of TransGrid's revenue proposal. Responses to the AER's comments are set out by Incenta in Appendix M, TransGrid, Total Debt Raising Cost – Updated Report. Ashurst's legal opinion on the AER's rationale for rejecting some of the debt raising costs is in Appendix N.

6.10 Inflation Rate

The AER's opex model converts TransGrid's nominal base year opex to June 2014 dollar terms using an inflation adjustment. The AER has applied a 15-month lag to the inflation index for use in the model, on the basis that the roll forward model uses a 15-month lag. TransGrid requested HoustonKemp to examine the AER's approach and rationale for the 15-month lag. HoustonKemp advised that the use of a 15-month lag is incorrect, and that the rationale for the use of a 15-month lag in the roll forward model does not apply to the opex model for conversion of base year opex from nominal to June 2014 dollar terms. HoustonKemp's advice is attached as Appendix I.

The roll forward model applies lagged inflation to ensure that the depreciation allowance removed from the RAB matches the revenues received in the MAR, which is calculated using lagged inflation.

However, the adjustment of base year opex to real June 2014 dollars in the opex model is not attempting to match revenues received by the TNSP during the 2009/10 to 2013/14 regulatory control period. Therefore, it is inappropriate to use a 15-month lag when using inflation to calculate base year opex in June 2014 dollars.

TransGrid has used the CPI factors without a 15-month lag in its forecast operating expenditure.

7 Regulatory Asset Base

The regulatory asset base is the value, as calculated in the AER's roll forward model, of the assets used by TransGrid to provide regulated network services.

7.1 Summary of Revenue Proposal

Chapter 7 of TransGrid's revenue proposal provided details of the proposed roll forward value of the regulatory asset base (RAB) as at 1 July 2014 using the AER's Roll Forward Model (RFM) and the forecast closing balance of RAB as at 30 June 2018 using the Post-Tax Revenue Model (PTRM).

7.2 Summary of Draft Decision

In the draft decision, the AER:

- accepted the opening RAB of $6,146.7 million as at 1 July 2014, and indicated that it would update it for actual capital expenditure in 2013/14 in the final decision;
- revised the forecast closing RAB at 30 June 2018 to reflect its draft decision on forecast capital expenditure and regulatory depreciation;
- determined that the forecast depreciation approach is to be used to establish the RAB at the commencement of the regulatory control period from 1 July 2018, applying to both the transitional (2014/15) and subsequent (2015/16 to 2017/18) regulatory control periods; and
- determined that the capital expenditure sharing scheme (CESS) will be applied to TransGrid's subsequent regulatory period.

7.3 Response to Draft Decision

TransGrid has updated its proposed opening tax asset base for actual capital expenditure in 2013/14, and has not accepted the AER's draft decision on the value of imputation credits. TransGrid addresses these matters in this revised revenue proposal. A summary of the matters addressed is set out in Table 7.1.

Table 7.1
Summary of Matters Addressed in Revised Proposal

Matter	AER Draft Decision	TransGrid Response
Inflation forecast	Updated inflation to November 2014 Statement of Monetary Policy	Accept
Forecast capital expenditure	Substituted an alternate forecast of capital expenditure	Does not accept the AER's alternate forecast, and has revised its capital expenditure forecast in Chapter 5

7.4 Opening RAB at 1 July 2014

TransGrid acknowledges the AER's acceptance of the proposed opening RAB of $6,146.7 million.

The AER accepted the actual capital expenditure in TransGrid's proposal from 2008/09 to 2012/13. TransGrid notes that the draft decision has incorrectly noted the adjustment in 2012/13 for actuals to be $1 million rather than $0.1 million, but this error is not carried through in the Roll Forward Model.

The opening RAB was calculated based on the estimated capital expenditure for 2013/14 because the full proposal was prepared and submitted prior to the end of the 2013/14 financial year. The AER indicated that it would update the opening RAB for actual capital expenditure in 2013/14 in the final decision.

In this revised proposal, TransGrid has updated the Roll Forward Model (RFM) with the actual audited capital expenditure for 2013/14, consistent with the annual regulatory accounts submitted to the AER for 2013/14 financial year.

The revised opening RAB reflects the actual capital expenditure for 2009/10 to 2013/14. The actual capital expenditure for 2009/10 to 2012/13 is consistent with the AER approved capital expenditure in the draft decision. The revised opening RAB as at 1 July 2014 is shown in Table 7.2.

Table 7.2
Revised Roll Forward Value of the Regulatory Asset Base ($m nominal)

RAB	2009/10 Actual	2010/11 Actual	2011/12 Actual	2012/13 Actual	2013/14 Actual
Opening RAB	4,217.5	4,578.8	4,926.0	5,174.6	5,607.2
Net Capital Expenditure as Incurred	418.5	376.2	354.8	502.2	486.1
Straight line Depreciation	-179.0	-181.7	-184.2	-199.1	-222.3
Inflation Adjustment	121.8	152.6	78.1	129.5	164.3
Closing RAB	4,578.8	4,926.0	5,174.6	5,607.2	6,035.3
Adjustment for Actual Capital Expenditure in 2008/09 Plus Return					41.0
Opening RAB 1 July 2014					**6,076.3**

Source: TransGrid. Totals may not add due to rounding.

7.5 Forecast Closing RAB at 30 June 2018

TransGrid has revised downward its forecast capital expenditure for 2014/15 to 2017/18 compared with the revenue proposal, as set out in Chapter 5. Consequently, the regulatory depreciation has been revised in Chapter 9 in accordance with the AER approved methodology.

Using the opening RAB shown in Table 7.3, and rolling over the asset base based on the revised forecast capital expenditure and regulatory depreciation, the forecast RAB for 2014/15 to 2017/18 is shown in Table 7.3.

Table 7.3
Revised Forecast Regulatory Asset Base ($m nominal)

RAB	2014/15	2015/16	2016/17	2017/18
Opening RAB	6,076.3	6,343.3	6,658.5	6,878.5
Net Capital Expenditure	358.3	421.0	340.8	340.8
Straight Line Depreciation	-243.2	-264.3	-287.3	-277.7
Inflation Adjustment	151.9	158.6	166.4	171.9
Closing RAB	**6,343.3**	**6,658.5**	**6,878.5**	**7,113.5**

Source: TransGrid. Totals may not add due to rounding.

In discussions with consumers, some have raised the question of why the RAB is forecast to increase markedly over the current period, particularly in an environment of stable or declining demand. TransGrid understands this concern.

TransGrid is currently in a period of increased replacement expenditure, necessitated by the condition of a number of assets, some of which date from the creation of the transmission network. These assets are typically fully depreciated and as such are no longer part of the RAB, irrespective of their ongoing role in network service provision. When these assets are finally retired and replaced, the full replacement value is added to the RAB, resulting in the increase in RAB noted by stakeholders. The change in TransGrid's RAB therefore reflects the stage TransGrid is at in the investment cycle.

7.6 Forecast Depreciation

TransGrid accepts the AER's draft decision that the forecast depreciation approach is to be used to establish the RAB at the commencement of the regulatory control period from 1 July 2018. This approach will apply to both the transitional (2014/15) and subsequent (2015/16 to 2017/18) regulatory control periods.

7.7 Capital Expenditure Sharing Scheme

TransGrid accepts the AER's decision to apply the capital expenditure sharing scheme (CESS) to TransGrid's subsequent regulatory period, that is, 2015/16 to 2017/18. TransGrid has proposed to reinstate two exclusions from the CESS that the AER disagreed with in the draft decision, as discussed in Chapter 14.

8 Rate of Return

The rate of return is the return the business earns on its investments to fund both the cost of debt and the cost of equity it has incurred in making these investments.

The rate of return represents the weighted average cost of capital (WACC), measured as an estimated cost of debt and cost of equity of a benchmark efficient entity. The rate of return objective, as set out in the Rules, is to ensure that the rate of return is commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to TransGrid.

8.1 TransGrid's Rate of Return

TransGrid proposes a rate of return of 8.65% in this revised proposal.

This rate of return is derived from an immediate implementation of a 10 year historic trailing average cost of debt for a benchmark efficient business of 7.92%.[131] This rate should be updated annually to maintain the trailing average approach. No transition to the historic trailing average is required or proposed.

TransGrid believes the AER has erred in imposing a transition in its draft decision. The correction of this error accounts for approximately 0.75% of the difference in WACC from the AER's draft determination to this revised proposal.

This cost of debt estimate is marginally higher than the estimate in TransGrid's revenue proposal as TransGrid has modified the calculation of the debt numbers to more closely reflect the AER's preferred methodology.

The cost of equity proposed is 9.75%. This estimate is based on relevant information from noted and respected financial theory models, and an independent capital market expert's recent valuation of a business comparable to a benchmark efficient entity. Further, a comparison of the estimated return on equity to observed debt yields was undertaken to provide a reasonableness check.

This cost of equity is materially lower than the estimate in TransGrid's revenue proposal, as TransGrid has refreshed the point estimate proposed. This is in light of movements in the risk free rate since the time of the revenue proposal submission and feedback from TransGrid's consumer engagement that suggested the rate was higher than necessary.

TransGrid believes the AER in its draft decision did not consider all relevant information in calculating an appropriate cost of equity. Correcting for this leads to an increase of about

[131] HoustonKemp, *Response to the Draft Decision on the Return on Debt Allowance*, January 2015, Table 1, p5.

0.66% from the AER's draft decision on the rate of return to that proposed by TransGrid in this revised proposal.

To ensure TransGrid has prepared a Rule compliant and accurate rate of return proposal and revised proposal, independent advice has been sought from expert economic and finance advisors HoustonKemp and Frontier Economics, independent corporate advisory group Grant Samuel & Associates Pty Ltd (Grant Samuel), and banking corporations Westpac and UBS. TransGrid's proposal has included the expert advice obtained from each of these firms in Appendices O to U and utilises this advice in deriving the proposed rate of return and responding to the AER's draft decision. Further detail on all of the elements of this chapter is set out in these appendices.

TransGrid's response to the AER's proposed averaging periods is included in confidential Appendix V.

8.1.1 Rate of Return Calculations

The Rules require the use of a nominal vanilla WACC to estimate the rate of return. This formulation of the WACC applies a nominal post-tax return on equity and a nominal pre-tax return on debt, resulting in the nominal vanilla WACC.

In contrast, many unregulated businesses typically use a classical post-tax WACC. This results in the same effective WACC, but the post-tax WACC presentation will appear lower than a vanilla WACC due to the tax treatment of debt. For instance, TransGrid's proposed nominal vanilla WACC of 8.65% converts to 6.90% post-tax.

Grant Samuel, independent corporate advisor, uses a classical post-tax WACC which simplifies the calculation of tax costs within the context of a zero value of imputation credits. TransGrid has included a report from Grant Samuel responding to various statements made by the AER in regards to Grant Samuel's valuation of Envestra and the approach of market practitioners such as Grant Samuel, more generally. Consistent with its approach Grant Samuel has used a post-tax WACC for its valuations, so the resulting WACC estimates appear lower than would be the case if the vanilla WACC were to have been applied.

8.2 Cost of Equity

8.2.1 Summary of Revenue Proposal

TransGrid considers that the intention of the requirement in the Rules to have regard to all relevant estimation models, financial models, market data and other evidence is to broaden the range of information that informs the return on equity estimate. Accordingly TransGrid's approach to estimating the return on equity concludes that there are a number of sources of relevant information that can be used to improve the estimate of the return on equity. These are:

- the Sharpe-Lintner Capital Asset Pricing Model (SL CAPM);
- the Black Capital Asset Pricing Model;
- the Fama-French Three Factor Model;
- the Dividend Growth Model (DGM);
- an independent capital market expert's recent valuation of a business comparable to a benchmark efficient entity; and

- a comparison of the return on equity to observed debt yields as a means of a reasonableness check.

TransGrid's approach to estimating the cost of equity included identifying the relevant material as set out above. The point estimate of the return on equity should be established from the range of estimates produced using a qualitative analysis of:

- the way in which estimates are distributed within the range;
- the respective strengths and weaknesses of the relevant material used to construct the estimates that form the range; and
- prevailing market conditions that, at any particular time, may make a particular source of relevant material more or less relevant.

TransGrid considers that its proposed approach and the estimate of the return on equity produced by that proposed approach contributes to the allowed rate of return objective to a greater degree than the approach set out in the Guideline and in the AER's draft decision.

TransGrid's proposed return on equity was 10.5% in the revenue proposal.

8.2.2 Summary of Draft Decision

The AER has decided not to accept TransGrid's proposed cost of equity estimate or the methodology used to calculate the estimate.

The AER has proposed to continue to derive estimates from only the SL CAPM and:

- disregard all other financial models to estimate the benchmark cost of equity, for example estimates from the Fama French model; and
- to use information to either inform:
  - individual parameters of the SL CAPM, rather than to use the model consistent with the original purpose for which it was compiled; or
  - on the general direction of the cost of equity.

TransGrid notes that the AER's use of relevant material is inconsistent with its own criteria as elaborated in the draft decision to use "financial models ... consistent with the original purpose for which it was compiled".[132]

The AER's draft decision on return on equity was 8.1%.

8.2.3 Response to Draft Decision

TransGrid does not agree with the AER's draft decision on the return on equity nor the AER's assessment that the estimate "for each regulatory year contributes to the achievement of the allowed rate of return objective".[133] TransGrid maintains that the methodology proposed in TransGrid's revenue proposal for 2014/15 to 2018/19, and the return on equity produced by that approach, contributes to the allowed return on equity objective to a greater degree than the approach set out in the Guideline and as implemented by the AER in its draft decision.

[132] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 3 – Rate of Return*, 27 November 2014, p3-20.
[133] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 3 – Rate of Return*, 27 November 2014, p3-9.

TransGrid has already put forward an extensive and detailed argument as to why the AER's approach will not achieve the national electricity objective as it does not allow a benchmark efficient entity to recover its efficient costs. For full discussion see Section 8.6 of TransGrid's revenue proposal 2014/15 to 2018/19 and the Appendices V, W, X, Y and Z. TransGrid maintains this position and does not propose to put forward further argument to support this position given the depth of the submission already presented.

Updated Return on Equity

To maintain currency of the cost of equity estimate, TransGrid has refreshed the point estimate proposed in the revenue proposal in light of movements in the risk free rate since the time of the revenue proposal submission.[134] In addition, consumers have clearly supported a lower cost of equity estimate at TransGrid's consumer engagement forums. With these factors in mind, TransGrid has revised its proposed point estimate down to 9.75%. This revised point estimate remains within the range for the return on equity set out in Figure 8.1 of TransGrid's revenue proposal.[135]

Incorrect Use of the SL CAPM

TransGrid continues to maintain the preferred approach is to consider all relevant information consistent with TransGrid's revenue proposal and supporting expert papers. Nevertheless, TransGrid recognises that in spite of the extensive expert submissions made on behalf of the energy industry through the Rate of Return Guideline consultation process and separately in TransGrid, Jemena and ActewAGL's revenue proposals, the AER maintains its preference for the SL CAPM. Should the AER maintain its approach to estimation of equity returns, there are changes that should be made to the AER's application of the SL CAPM to mitigate established shortcomings of the model. These shortcomings are discussed in TransGrid's revenue proposal in both Section 8.6.2 and in more detail in Appendix V.

Grant Samuel, a leading independent expert valuer, provided valuable insights to a market practitioners application of the SL CAPM methodology as Appendix Z to TransGrid's Revenue Proposal. However the AER has not made any changes to its methodology in light of this report. Rather, the AER made adjustments that Grant Samuel believes are not a correct representation of its analysis and findings. Appendix O of TransGrid's revised proposal is a response from Grant Samuel that addresses the various statements the AER has made in regard to the approach to estimating the return on equity and the approach taken by market practitioners.

Grant Samuel's paper asserts that the AER's application of the SL CAPM is inconsistent with the market practitioner's approach. In particular, Grant Samuel strongly disagrees with the AER's view of Dividend Growth Models (DGM) and the apparent inequity the AER has applied in assessing the value of DGM versus the SL CAPM. Grant Samuel also takes exception to the manner in which the AER represents Grant Samuel's data in regards to the Envestra valuation.

TransGrid requests that the AER reconsiders their application of the SL CAPM in light of this further evidence.

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[134] The risk free rate for the averaging period for the 20 days to 6 January 2015 is 2.93%. This is a 1.21% decrease from the 4.14% risk free rate applicable at the time of drafting the revenue proposal. Consistent with the arguments raised by NERA in the revenue proposal, the return on equity estimates will have fallen by an amount somewhat less than the movement in the risk free rate.

[135] TransGrid, *Revenue Proposal 2014/15 – 2018/19*, 2 June 2014, p189

8.3 Cost of Debt

8.3.1 Summary of Revenue Proposal

In agreement with the AER's Guidelines, TransGrid proposed that:

- the benchmark efficient entity should be a pure play, regulated energy network business operating in Australia;
- the benchmark efficient entity would issue Australian corporate debt with a benchmark credit rating of BBB+ and a term to maturity of 10 years;
- the return on debt should be estimated using data published by an independent third party data service provider. TransGrid nominated the Reserve Bank of Australia (RBA) as its preferred provider;
- the benchmark efficient entity would stagger the maturity dates of its debt to minimise refinancing risk;
- the return on debt is calculated using a simple average of annual estimates of the return on debt over the last 10 years. This method is known as the trailing average approach; and
- the estimate of the return on debt should be updated annually. That is, the trailing average should be updated annually to:
  - include updated annual observations of the yield on non-financial Australian corporate bonds of a term of 10 years and a credit rating of BBB as reported by the RBA; and
  - remove the oldest annual observation.

TransGrid used the data published by the RBA to calculate the trailing average of estimates of the yield on non-financial corporate bonds with a 10 year term and a BBB credit rating. The return on debt at the time of lodging the revenue proposal using this approach was 7.72% for the 2014/15 year.

TransGrid proposed that no transition be imposed and the cost of debt be set on the basis of a historical 10 year trailing average using the independently published RBA data set. For clarity, the only point of difference with the AER Guideline was that there was no requirement to transition to the trailing average given it reflected TransGrid's existing efficient debt management practice.

8.3.2 Summary of Draft Decision

The AER draft decision implements the Rate of Return Guideline without modification. For estimating the cost of debt the AER's approach is:

- to use a 'trailing average portfolio approach'—that is, to estimate the average return that would have been required by debt investors in a benchmark efficient entity if it raised debt over an historical period prior to the commencement of a regulatory year in the regulatory control period
- to update the return on debt estimate annually (that is, for each regulatory year)
- to apply equal weights to all the elements of the trailing average.

To implement this approach the AER has used:

- a benchmark credit rating of BBB+;
- a benchmark term of debt of 10 years;
- an independent third party data series to estimate the return on debt
- to use an averaging period for each regulatory year of 10 or more consecutive business days up to a maximum of 12 months, where the averaging period is as close as practical to the commencement of each regulatory year[136]

The AER disagreed with TransGrid's choice of the RBA as the sole third party data source and has chosen to use a simple average of the RBA broad-BBB rated 10 year curve and Bloomberg data. For the Bloomberg data the AER proposes to use the broad-BBB rated seven year BVAL curve where available and alternatively the broad-BBB rated five year BVAL curve where the seven year data is not available. As neither of the Bloomberg curves provide 10 year data the AER has decided to extrapolate all data sources to an effective 10 year term using the RBA data set for extrapolation.

The AER has determined that a benchmark efficient entity is:

- pure play;
- regulated;
- energy network business; and
- operating within Australia.[137]

The AER has also decided that an efficient financing practice of the benchmark efficient entity regulated under the on-the-day approach would have been to hold a debt portfolio of floating rate debt and enter into interest rate swaps, to fix floating rate note into five year fixed interest rate debt at the time of the revenue reset.

The AER's estimate of the return on debt in the draft decision was 6.67% for the 2014/15 year.

8.3.3 Response to Draft Decision

In spite of the AER's statement that "TransGrid had challenged most aspects of the Guideline approach (and methods) to estimating the return on debt and equity",[138] TransGrid agreed almost in entirety with the AER's guideline approach to estimating the cost of debt. As TransGrid and the AER are in broad agreement on the method, approach and implementation of the estimate for the cost of debt, TransGrid's response to the draft decision is limited to two areas of contention. That is:

1. the data source for estimating the cost of debt; and
2. the requirement to transition a benchmark efficient business to the trailing average.

Data Source for Estimating the Cost of Debt

As discussed above, the AER has disagreed with TransGrid's proposed use of the RBA as the sole source of data for estimating the cost of debt. TransGrid maintains its preference to use the RBA data but accepts the AER's preferred approach for this regulatory decision, of

[136] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 3 – Rate of Return*, 27 November 2014, p3-23.
[137] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 3 – Rate of Return*, 27 November 2014, pp3-20 – 3-21.
[138] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 3 – Rate of Return*, 27 November 2014, p3-14.

taking the average of the two data sources however this should only be for periods where the Bloomberg seven year BVAL data is complete. TransGrid does not agree the five year BVAL is an acceptable alternate where the seven year data is not available.

HoustonKemp has analysed the Bloomberg seven year BVAL curve and found periods where the data is incomplete. Consequently, it recommends use of the RBA data only where the Bloomberg seven year data is not available. HoustonKemp does not recommend utilising the five year BBB BVAL where the seven year data is not available as it offers less insight into the likely yield on benchmark debt than the extrapolated 10 year BBB RBA curve. For further detail please see Attachment P of this revised revenue proposal.

In light of the missing data points in the BVAL series, TransGrid propose that the annual debt yield in years prior to 2012 is calculated using only the RBA curve. Specifically, consistent with the AER's preferred approach to extrapolating the data set to an effective 10 year term, the annual debt yield in years prior to 2012 should be calculated by extrapolating the RBA curve to better reflect a 10 year debt yield and then averaging the month-end yields in each calendar year.

Requirement to Transition a Benchmark Efficient Business to the Trailing Average

AER's View of an Efficient Debt Management Practice

The AER's view that an efficient financing practice for the benchmark efficient business would have been:

- to borrow long term (10 year) debt and stagger the borrowing so that only a small proportion (around 10 per cent) of the debt matured each year
- to borrow using floating rate debt (or to borrow fixed rate debt and convert this to floating rate debt using fixed-to-floating interest rate swaps at the time of issuing the debt and which extended for the term of the debt, being 10 years), and
- to enter into floating-to-fixed interest rate swaps at, or around, the time of the service provider's averaging period and which extended for the term of the regulatory control period, being typically five years).[139]

The AER consider this would have been an efficient financing practice of the benchmark efficient entity subject to the on-the-day approach to estimating the cost of debt because:

- Compared with the alternative possible debt financing strategies, this strategy would have more effectively managed refinancing risk and interest rate risk, and also resulted in a lower expected actual return on debt, and
- It is the financing strategy that was generally adopted by most private service providers under the on-the-day approach.[140]

In regards to managing refinancing risk, the AER's staggered debt portfolio approach is the normal approach adopted by most large infrastructure businesses (both regulated and unregulated). Consequently, TransGrid agrees with this aspect of the AER's view on efficient financing practices of the efficient benchmark entity.

However, while TransGrid recognises that some smaller regulated businesses choose to enter into interest rate swaps to partially manage interest rate risk (noting that only the risk

[139] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 3 – Rate of Return*, 27 November 2014, p3-116.
[140] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 3 – Rate of Return*, 27 November 2014, p3-116.

free rate component is hedged in such a manner), TransGrid does not consider this a necessary feature of efficient financing practice.

TransGrid is of the view that the AER's preference to transition all businesses to the 10 year historic trailing average is unwarranted for businesses that currently manage a staggered debt portfolio and do not use interest rate swaps. In the remainder of this chapter TransGrid will provide evidence that:

- there is more than one approach for a benchmark efficient business to efficiently manage its debt practices;
- the interest rate swap model is at best an imperfect hedge and may be more disruptive to the natural hedge that exists between the risk free rate and the debt risk premium than a help;
- minimising the cost of debt is better addressed through a flexible debt management policy that makes informed judgements as to when to issue debt and in what form rather than being tied to the comparatively arbitrary timing of a revenue reset. This is backed up by data from the Productivity Commission that shows electricity businesses that do not use interest rate swaps have a lower average actual cost of debt over a five year period;
- there is substantial evidence from Westpac, UBS and a large market participant that the interest rate swap market is not sufficiently liquid for large businesses to utilise successfully simultaneously and certainly not without facing material costs; and
- should there be no transition, both the AER's expert adviser Dr Lally and TransGrid's expert advisers agree that there is no windfall gain in the current regulatory period, and the cost of debt allowance will match the benchmark efficient cost of debt.

Efficient Debt Management Practice

TransGrid has sought advice from Professor Stephen Gray of the University of Queensland and Director of Frontier Economics, a specialist economics and corporate advisory firm. Professor Gray supports TransGrid's view that there is clearly more than one efficient debt management practice for businesses subject to on the day regulation. Specifically, Professor Gray observes that while all smaller businesses adopt interest rate swaps consistent with the AER's view of benchmark efficient practice, none of the larger regulated electricity businesses does so. Professor Gray also observes that this concept of more than one efficient debt management practice was clearly considered by the AEMC in developing the Rules.

To support the position that TransGrid's choice of debt management practices is an efficient response to the risks TransGrid faces, TransGrid has prepared a statement that sets out the process that TransGrid underwent in consultation with its Board, to arrive at the current debt management policy. This policy was developed in the lead up to the 2009 determination and with foresight of the regulatory framework that would apply for that decision. It is not an accident or product of TransGrid's inferred inefficiency as suggested by the AER.[141]

Negative Correlation Between the Risk Free Rate and the Debt Risk Premium

HoustonKemp has provided detailed academic references for studies that conclude there is a natural hedge between the risk free rate and the debt risk premium which raises questions

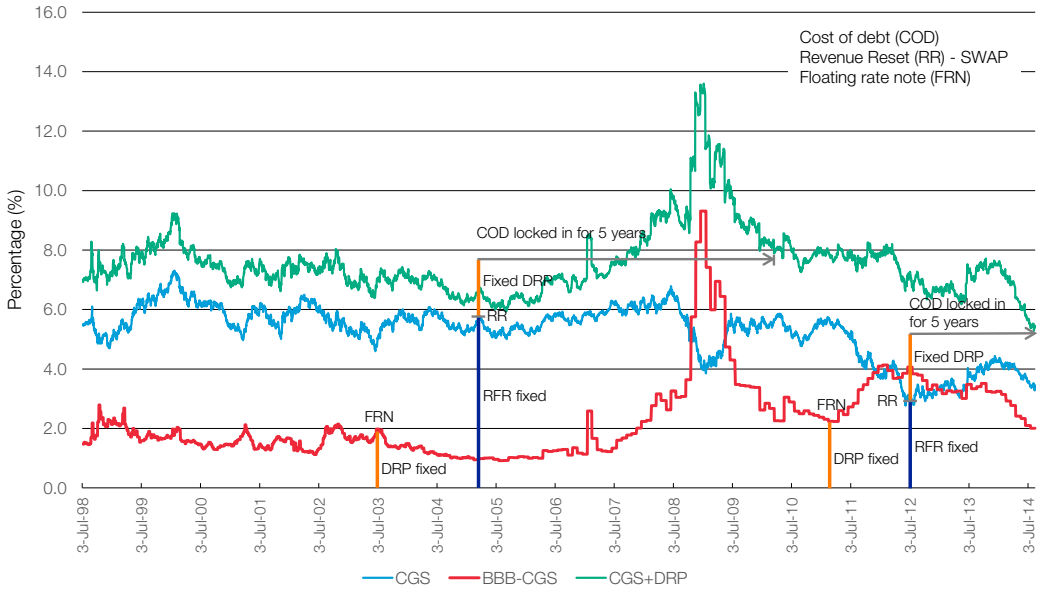
[141] Boon Thiow, *Statement of Boon Thiow* affirmed on 12 January 2015.

on the relative efficiency of the interest rate swap strategy.[142] As the risk free rate rises the debt risk premium falls and conversely as the risk free rate falls the debt risk premium rises. Locking in one component disables the natural hedge and may result in limited or no reduction in the interest rate risk. Furthermore, as noted by HoustonKemp, it may drive the perverse incentive to minimise only the debt risk premium component rather than the total cost of debt.[143] Taking into consideration the negative correlation between the risk free rate and the debt risk premium, the business is incentivised to enter into floating rate note at a time when the debt risk premium is lower than usual, which may also be when total cost of debt is higher than usual.

Figure 8.1 illustrates how an interest rate swap works and the possible impact of the mismatch between fixing the risk free rate (RFR) at one time and the debt risk premium (DRP) at another time. Two examples of possible interest rate swaps are shown.

On the left hand example, the debt issuer raises floating rate note (FRN) at a point in time to coincide with debt requirements and preferably when there are opportunities to minimise the debt risk premium (DRP) component. Sometime later, the revenue reset averaging period occurs and irrespective of market conditions, the interest rate swap is entered into. In this example, the natural hedge works against the business as the DRP has continued to fall since the time they issued the FRN reflecting the rising risk free rate (RFR). The mismatch results in a higher overall cost of debt as compared to locking in fixed rate debt at the time the FRN was issued. The example on the right hand side plays out in reverse and the business benefits materially from the mismatch between the RFR and the DRP.

Figure 8.1
Examples of Interest Rate Swaps



Source: TransGrid.

Minimising the Cost of Debt

The AER's view that entering into interest rate swaps for a fixed five year period will lower the cost of debt compared to a business locking into a fixed 10 year period is not the

[142] HoustonKemp, *Response to the Draft Decision on the Return on Debt Allowance*, January 2015, p17.
[143] HoustonKemp, *Response to the Draft Decision on the Return on Debt Allowance*, January 2015, p11.

correct comparison. Businesses not subject to interest rate swaps are able to manage their financing cost more effectively by choosing their timing for raising or renewing debt and the length of tenor of the debt, taking into consideration current market conditions and outlook.

Professor Gray steps through the issues and options to be considered when constructing a debt portfolio and notes "the combination of issuing long-term debt with staggered maturities is a common and effective means of mitigating refinancing risk and interest rate risk".[144] Professor Gray then goes on to discuss efficient debt management practices and is clear that in both his opinion, and indeed that of the AEMC which considered this question at the time of drafting the new Rules in 2012, there is no single efficient debt management practice. For a more detailed discussion of these efficient debt management choices and practices see Appendix P for Professor Gray's submission.

TransGrid has provided a statement, as Appendix T, that sets out TransGrid's actual approach to debt management. This statement demonstrates in a practical manner the range of choices a business faces when managing its debt efficiently. In essence, TransGrid's debt management policy may be characterised as flexible (ie, not restricted to any specific tenor or the timing of when to raise debt) and seeking a balance between managing both interest rate and refinancing risk and minimising the total cost of debt.

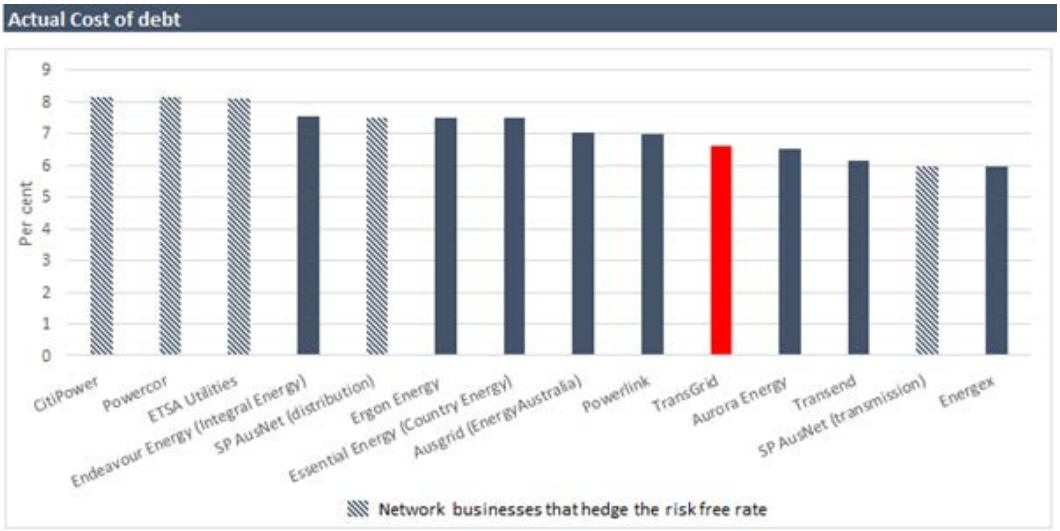
As further demonstration of the effectiveness of managing a staggered debt portfolio without interest rate swaps, TransGrid notes the Productivity Commission released a study in 2013 of Electricity Network Regulatory Frameworks. Amongst other issues, the Productivity Commission specifically investigated the average actual cost of debt over a five year period of fourteen of the regulated electricity network businesses in Australia on the basis of publicly available information.[145] The Productivity Commission analysis shows that of the nine businesses with the lowest actual cost of debt, all but one business were not engaged in interest rate swaps. Additionally, four of the five businesses with the highest actual cost of debt utilised interest rate swaps to manage their interest rate risk.

HoustonKemp, in Appendix Q, demonstrate that a network following the AER's preferred interest rate swap strategy does not have an incentive to minimise its total cost of debt. Rather, under this strategy networks have an incentive to only minimise the debt risk premium irrespective of the total cost of debt. In contrast, a strategy of issuing fixed rate debt incentivises the business to issue debt at lowest cost.

In contrast to the AER's assertion that interest rate swaps lead to cost of debt minimisation, it is quite clear that a business which chooses to lock in its interest rate at the time of a regulatory decision irrespective of market circumstances is not necessarily minimising its cost of debt. This can be compared with TransGrid's debt management policy where minimising the cost of debt is an explicit objective of the policy. The Productivity Commission data appears to demonstrate this position.

[144] Frontier Economics, *TransGrid Cost of Debt Transition*, January 2015, paragraph 55, p7.
[145] Productivity Commission, *Electricity Network Regulatory Frameworks, Productivity Commission Inquiry Report, Volume 1, No. 62*, 9 April 2013, p208.

Figure 8.2
Actual Cost of Debt



Source: Productivity Commission.

Too Large to Hedge

Both Dr Lally and the AER have dismissed the argument that the interest rate swap market in Australia is too small to accommodate the interest rate swap requirements of all of the NSW network businesses, ActewAGL and Transend at one time. All of these businesses have historically been regulated on the same timeline and accordingly the AER determines averaging periods for all of these businesses at or around the same time. To implement the AER's preferred debt strategy, all of these businesses would necessarily need to access the interest rate swap market at or around the same time.

UBS, in Appendix R, has provided clear analysis of the interest rate swap market at the time of the last revenue determination and has arrived at the clear view the market could not have accommodated the necessary swaps at this time.

TransGrid has also submitted a letter from the Australian Office of Financial Management[146] (AOFM) as further relevant information in regards to the liquidity of the interest rate swap market at the time of TransGrid's last reset. The Australian Office of Financial Market commenced in November 2008 a program to unwind a large portfolio of interest rate swaps of varying tenor. TransGrid notes that it is somewhat more difficult to unwind swaps than to place them however the varying length of tenor would have mitigated this and presented less difficulties than trying to place fixed five year tenor for all swaps. The AOFM took a little over 6 months to unwind $15.25 billion of interest rate swaps. The businesses with resets in early 2009, represent a total notional debt of $13.26 billion, all of which would have required to be swapped in five year tenor over a 20 to 40 day period.

TransGrid previously submitted evidence from Westpac, as Appendix AA of the revenue proposal that attested to the same fact, that the market is not sufficiently liquid to accommodate this level of swaps without material cost, and over a longer time frame. Westpac specifically noted:

> In our opinion this is not feasible without materially impacting NSPs cost of funds.

[146] Australian Office of Financial Management, *Letter to the NSW Treasury Corporation*, 5 January 2015.

> The requirement of the regulatory process to execute this volume of swaps in such a short period may attract a higher cost from the market even if it is spread over a period such as eighty business days. It is not possible to fully anticipate the response from the market from such a large volume of transactions.

This evidence is further backed up by comments from Professor Gray in Appendix P and HoustonKemp in Appendix Q that in their view, there is clear evidence to suggest there is insufficient liquidity in the market for interest rate swaps to accommodate the NSW business requirements. Further, that liquidity constraint would result in a significant increase in hedging costs should such a strategy be attempted.

Nevertheless, the AER suggests in its draft decision that any efficient business would have entered into such interest rate swaps. TransGrid asserts that the expert advice from major banks Westpac and UBS both of which are significant participants in these very markets, its advisers Professor Gray and HoustonKemp and the evidence of AOFM should be afforded significantly more weight by the AER than the views of the one academic it engaged to provide advice.

There are good reasons that the regulatory framework applies a benchmark efficient model, the benefits are set out in HoustonKemp's paper. However, the regulatory framework fails when businesses are held to account to a benchmark efficient model that is impossible to apply in practice. That is, the benchmark efficient model must be feasible for an efficient business to implement.

The AER has also indirectly acknowledged that there may indeed be a problem with liquidity of the interest rate swap market with the fall-back position that "hedging over a period that is longer than the averaging period would have been superior to not hedging at all".[147] Noting that Professor Lally has also made the same somewhat arbitrary claim does not constitute "analysis".[148] UBS advice addresses these comments directly and finds that in fact there would be a significant cost of $157 million involved in extending the hedging period beyond the averaging period.[149]

Within the discussion of the length of the averaging period to effect interest rate swaps, the AER has also noted that the current regulatory period allows for much longer averaging periods,[150] up to 12 months. TransGrid notes that for the existing debt portfolio this recent change in the Rules is of no assistance, as to effect the interest rate swap strategy the fixed rate debt must be converted to floating rate note at the time of issuing the debt. TransGrid has proposed a longer averaging period for the current regulatory period but this is to better support TransGrid's management of interest rate risk via the staggered debt portfolio. Even so, the AER's new approach to longer averaging periods would only be helpful to TransGrid for new debt issuances. The interest rate on the existing $3.6 billion notional debt portfolio will continue to be mismatched from the revenue allowance should the AER retain the transition methodology.

No Windfall Gain

Dr Lally has claimed that TransGrid might benefit from some form of windfall gain should there be no transition to the trailing average, however this appears to be on a retrospective

[147] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 3 – Rate of Return*, 27 November 2014, p3-295.
[148] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 3 – Rate of Return*, 27 November 2014, p3-295.
[149] UBS, *UBS response to the TransGrid request for interest rate risk analysis following the AER Draft Decision of November 2014, p3.*
[150] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 3 – Rate of Return*, 27 November 2014, p3-294.

basis. Professor Gray finds there is no windfall gain or loss for a firm that implements a staggered debt portfolio, as TransGrid has done, if there is no transition. TransGrid would simply be getting compensated for its benchmark efficient debt service costs. Dr Lally also notes than in the current period there would be no windfall gain without a transition. That is to say, both Professor Gray and Dr Lally agree that there is no mismatch in the current regulatory period between the allowed cost of debt and the benchmark efficient cost of debt if no transition is implemented.

Dr Lally's basis for supporting the transition is that businesses should be under-compensated in the current period due to an assumed over-compensation in the prior period. The AER has not attempted to assess how many periods back this approach should attempt to measure and whether indeed the business has been undercompensated in earlier regulatory periods. HoustonKemp has looked at this question and notes that in the prior regulatory period, ie, 2004/05 – 2008/09 it is likely that the AER allowance undercompensated TransGrid compared to the benchmark efficient costs.[151]

Dr Lally's view on the need for a transition is to ensure the business is undercompensated in the current period but he also takes care to claim this undercompensation is not a clawback. Professor Gray refutes Dr Lally's claim that this is not a clawback and finds that Dr Lally's approach would indeed amount to a clawback and would be inconsistent with incentive-based regulation. In this case, a 'clawback' is a removal of revenue in the current period to offset a perceived overcompensation in the prior period.

Both Professor Gray and Dr Lally, are clear that given the nature of the prior 'on the day' methodology, that there was always a windfall gain or loss in each regulatory period because it was impossible to match the regulatory allowance. Professor Gray's findings are consistent with HoustonKemp's discussion in Appendix Q.[152]

The Rules are based on incentive based regulation, that is a forward looking framework that incentivises businesses to mimic competitive market behaviours, minimise costs and achieve the national electricity objective. The Rules do not include retrospective provisions or options for the AER to allow less than efficient costs in the current period.

Immediate Implementation to Trailing Average Cost of Debt Approach

The key findings of both HoustonKemp and Professor Gray is that without transition TransGrid is simply provided a regulatory allowance that is commensurate with its actual debt service costs, which are incurred using the very debt management practice that the AER now says is the most efficient practice that would be adopted by the benchmark efficient entity. Professor Gray also makes the point this is the same efficient debt management practice that many large private sector non-regulated infrastructure businesses would adopt. The AER is required under the Rules to provide a cost of debt allowance commensurate with the efficient cost of debt for a benchmark firm. The AER proposes to allow TransGrid materially less than this amount through the application of its transition mechanism.

HoustonKemp has prepared a detailed response to the AER's draft determination which is not reproduced in this chapter. Appendix Q should be referred to for a more detailed discussion of the AER's position. Similarly, TransGrid submitted a detailed and extensive analysis from NERA as Appendix V to TransGrid's revenue proposal supporting TransGrid's argument that the imposition of the transitional arrangements was inappropriate. TransGrid

[151] HoustonKemp, *Response to the Draft Decision on the Return on Debt Allowance*, January 2015, p22.
[152] Frontier Economics, *TransGrid Cost of Debt Transition,* January 2015, paragraphs 99-100, p18.

maintains the analysis and reasoning presented in the NERA paper remains relevant and sound.

Availability of Historical Data

The AER has raised a concern with the availability of historical data to implement the historic 10 year trailing average. TransGrid has already identified appropriate data from the RBA and, where available, Bloomberg to ensure consistency with the AER's preferred approach. Therefore, TransGrid does not believe the AER's concern with the availability of historical data is warranted. Furthermore, Professor Gray makes the observation the AER was able to make regulatory decisions over this historical period and has the same access to that data now as it did then.

Conclusion

While TransGrid agrees with all other aspects of the AER's approach to measuring the cost of debt, TransGrid does not agree that a transition arrangement is either appropriate or required. TransGrid has presented categorical evidence from specialist corporate finance expert Professor Gray, regulatory economics experts HoustonKemp, banking corporations Westpac and UBS, and applied practical experience from the Australian Office Of Financial Management that the AER's assumptions are incorrect in regards to both the financing practices of the efficient benchmark firm and the need for a transition to a historic trailing average for a firm such as TransGrid.

9 Depreciation

This chapter presents TransGrid's forecast of the depreciation on prescribed assets during the 2014/15 to 2017/18 period.

Depreciation is part of the annual building block revenue requirement calculated in accordance with Clause 6A.5.4 of the Rules. The annual regulatory depreciation allowance is a depreciated value of the RAB that reflects the nature of the assets over their economic life.

The allowable regulatory depreciation is also referred to as "return of capital", and is straight line depreciation of the RAB less the inflation adjustment.

9.1 Summary of Revenue Proposal

TransGrid set out its proposed regulatory depreciation in Chapter 10 of the revenue proposal.

In accordance with the requirements of Clause 6A.6.3 of the Rules, TransGrid applied the straight line depreciation method to each asset category in the RAB over the economic life of the asset across the regulatory control period, based on the value of the assets included in the RAB at the beginning of each regulatory year.

TransGrid also proposed asset classes and standard asset lives for the depreciation profile.

9.2 Summary of Draft Decision

In the draft decision, the AER:

- accepted the straight-line depreciation calculation methodology;
- accepted the proposed standard asset lives for the asset classes;
- accepted the weighted average method to calculate remaining asset lives;
- accepted the inflation forecast methodology, and updated the forecast based on the Reserve Bank of Australia (RBA) November 2014 Statement of Monetary Policy. This resulted in a lower inflation rate and hence lower inflation indexation adjustments to the opening RAB; and
- did not accept the proposed regulatory depreciation for the 2014/15 to 2017/18 period due to changes made by the AER in the draft decision to the forecast capital expenditure and inflation indexation on the opening RAB.

9.3 Response to Draft Decision

TransGrid acknowledges the AER's acceptance of:

- the straight-line depreciation methodology;
- the proposed standard asset lives;
- the weighted average method to calculate remaining asset lives; and
- the inflation forecast methodology.

TransGrid's proposed inflation forecast was based on the RBA February 2014 Statement of Monetary Policy, which the most recent data available at that time prior to the submission of the revenue proposal in May 2014. TransGrid has updated the inflation forecast based on the RBA Statement of Monetary Policy released in November 2014.

TransGrid has not accepted the AER's changes to forecast capital expenditure, and has revised its capital expenditure forecast as set out in Chapter 5.

Accordingly, TransGrid addresses these matters in this revised revenue proposal. A summary of the matters addressed is set out in Table 9.1.

Table 9.1
Summary of Matters Addressed in Revised Proposal

Matter	AER Draft Decision	TransGrid Response
Inflation forecast	Updated inflation to November 2014 Statement of Monetary Policy	Accept
Forecast capital expenditure	Substituted an alternate forecast of capital expenditure	Does not accept the AER's alternate forecast, and has revised its capital expenditure forecast in Chapter 5

9.4 Revised Depreciation Forecast

The revised regulatory depreciation forecast on the basis of the revised capital expenditure and inflation forecasts is shown in Table 9.2.

Table 9.2
Revised Depreciation Forecast ($m nominal)

	2014/15	2015/16	2016/17	2017/18
Straight line Depreciation	243.2	264.3	287.3	277.7
Less: Inflation Adjustment on RAB	-151.9	-158.6	-166.4	-171.2
Regulatory Depreciation	**91.3**	**105.8**	**120.9**	**105.8**

Source: TransGrid. Totals may not add due to rounding.

The detailed depreciation schedule is attached as Appendix W.

10 Corporate Income Tax

Clause 6A.5.4(a)(4) of the Rules requires that the estimated cost of the corporate income tax allowance must be made as part of the post-tax nominal approach to the revenue determination.

10.1 Summary of Revenue Proposal

TransGrid presented its methodology to derive its proposed corporate income tax allowance in Chapter 11 of the revenue proposal. The post-tax revenue model (PTRM) was used to calculate the income tax allowance.

10.2 Summary of Draft Decision

In the draft decision, the AER:

- accepted the proposed opening tax asset base, and indicated that it would update it for actual capital expenditure in 2013/14 in the final decision;
- accepted the proposed standard and remaining tax asset lives for calculating the tax depreciation as contained in the proposed PTRM;
- did not accept the proposed value of imputation credits; and
- did not accept the proposed corporate income tax allowance as a result of the AER's draft decision on other building block components, including forecast operating expenditure and capital expenditure.

10.3 Response to Draft Decision

TransGrid has updated its proposed opening tax asset base for actual capital expenditure in 2013/14, and has not accepted the AER's draft decision on the value of imputation credits. TransGrid addresses these matters in this revised revenue proposal. A summary of the matters addressed is set out in Table 10.1.

Table 10.1
Summary of Matters Addressed in Revised Proposal

Matter	AER Draft Decision	TransGrid Response
Inflation forecast	Updated inflation to November 2014 Statement of Monetary Policy	Accept
Forecast expenditure	Substituted alternate forecasts of capital and operating expenditure	Does not agree with the AER's alternate forecasts, and has revised its expenditure forecasts in Chapters 5 and 6
Value of imputation credits	Proposed a value for gamma of 0.4	Does not agree The best available method for estimating the utilisation rate is the dividend drop-off method Proposes a value for gamma of 0.25

10.4 Opening Tax Asset Base at 1 July 2014

TransGrid acknowledges the AER's acceptance of the proposed opening tax asset base of $3,792.8 million. This opening tax asset base was calculated based on the forecast capital expenditure for 2013/14 because the full proposal was prepared and submitted prior to the end of 2013/14 financial year.

In this revised proposal, TransGrid has updated the Roll Forward Model with the actual audited capital expenditure for 2013/14, consistent with the annual regulatory accounts submitted to the AER for the 2013/14 financial year.

The revised opening tax asset base reflects the actual capital expenditure for 2009/10 to 2013/14. The actual capital expenditure for 2009/10 to 2012/13 is consistent with the AER's approved capital expenditure in its draft decision.

The revised tax asset base for the 2009/10 to 2013/14 regulatory control period is shown in Table 10.2.

Table 10.2
Revised Tax Asset Base Roll Forward ($m nominal)

TAB	2009/10	2010/11	2011/12	2012/13	2013/14
Opening TAB	2,718.0	2,800.8	3,001.4	3,189.2	3,382.8
Net Capital Expenditure	221.0	345.1	345.5	362.6	554.0
Tax Depreciation	-138.3	-144.4	-157.7	-169.0	-185.9
Closing TAB	**2,800.8**	**3,001.4**	**3,189.2**	**3,382.8**	**3,750.8**

Source: TransGrid. Totals may not add due to rounding.

10.5 Value of Imputation Credits

TransGrid does not accept the AER's decision on the value of imputation credits. TransGrid has already put forward an extensive and detailed argument supporting its proposed approach in Chapter 9 and Appendix AB of the revenue proposal. TransGrid's approach has been supported by the SFG report *An Appropriate Regulatory Estimate of Gamma*, attached as Appendix AC of the revenue proposal. TransGrid maintains this position and does not propose to put forward any further argument to support this position, given the depth of the submission already presented.

TransGrid agrees with the AER's distribution rate of 0.7 as set out in the draft decision. However, TransGrid still considers that the best available method for estimating the utilisation rate is the dividend drop-off method, and therefore gives primary weight to this method in determining a value for theta. In this revised proposal, TransGrid proposes the value of the utilisation rate to be 0.35, which combined with the AER's distribution rate of 0.7, gives the gamma of 0.25.

10.6 Revised Corporate Income Tax

TransGrid acknowledges the AER's acceptance of the proposed standard and remaining tax asset lives for calculating the tax depreciation, as contained in the proposed PTRM. TransGrid has revised the corporate income tax allowance based on the:

- revised opening RAB, to reflect 2013/14 actual expenditure;
- approved standard and remaining tax asset lives, consistent with those approved by the AER in the draft decision;
- revised forecast capital expenditure in Chapter 5;
- revised forecast operating expenditure in Chapter 6; and
- proposed gamma of 0.25.

TransGrid has calculated its allowance for corporate income tax in accordance with the methodology set out in Clause 6A.6.4 of the Rules, using the AER's post-tax revenue model. The revised proposal for corporate income tax for 2014/15 to 2017/18 is shown in Table 10.3.

Table 10.3
Revised Corporate Tax Allowance ($m nominal)

	2014/15	2015/16	2016/17	2017/18
Corporate Income Tax	52.4	56.7	82.7	84.5
Less: Value of Imputation Credits	-13.1	-14.2	-20.7	-21.1
Total Allowance	**39.3**	**42.5**	**62.0**	**63.4**

Source: TransGrid. Totals may not add due to rounding.

11 Shared Assets

Shared assets are assets that are used to provide both prescribed transmission services and non-regulated services.

TransGrid's prescribed assets are funded by consumers through their use of prescribed services. TransGrid may also provide non-regulated services on a commercial basis which utilise prescribed assets where it is efficient to do so.

If it is known at the time of investing in an asset that it will be used for both prescribed and non-regulated services, only a proportion of the asset's cost is added to the regulatory asset base. This ensures that electricity customers only pay for the share of the asset they use.

Occasionally, an asset will be fully included in the regulatory asset base, but at some point later in the asset's life it may also be used for non-regulated services. At this time the asset becomes a "shared asset".

Consumers who fund shared assets through their electricity bills can share in the benefits of the unregulated activities by an amount that reflects the alternate use of the asset.

11.1 Summary of Revenue Proposal

In the revenue proposal, TransGrid applied the AER's *Shared Assets Guideline* to determine whether revenue reductions for shared assets were required. The outcome was that in all years, non-regulated revenue from shared assets is forecast to be below the materiality threshold set out in the guideline, that is 1% of the smoothed annual revenue requirement. Therefore, cost reductions for shared assets should not apply.

11.2 Summary of Draft Decision

In the draft decision, the AER accepted TransGrid's proposal that cost reductions for shared assets should not apply, on the basis that the unregulated use of shared assets is not material.

11.3 Response to Draft Decision

TransGrid accepts the draft decision on shared assets, and does not address any matters relating to shared assets in this revised proposal.

12 Maximum Allowed Revenue

The maximum allowed revenue defines the maximum amount of revenue TransGrid proposes it be allowed to recover in each year of the upcoming regulatory control period.

TransGrid's calculation of the maximum allowed revenue (MAR) responds to the AER's draft decision and reflects the revised forecast capital expenditure in Chapter 5, revised forecast operating expenditure in Chapter 6 and updated rate of return for each year of the 2014/15 to 2017/18 period.

The calculations are based on the building block approach outlined in the National Electricity Rules and the AER's post-tax revenue model.

The pricing methodology approved by the AER is applied to the MAR to calculate prices for TransGrid's transmission customers.

The detailed information substantiating the building block components has been described in the preceding chapters. This chapter summarises the building block approach and presents the resultant maximum allowed revenue and x-factor, along with an indication of the average price path.

12.1 Building Block Approach

12.1.1 Regulatory Asset Base

The revised regulatory asset base after updating for the actual capital expenditure in 2013/14 is $6,076.3 million.

Asset values have been rolled forward using the revised forecast capital expenditure in Chapter 5 and forecast regulatory depreciation as detailed in Chapter 9. The forecast RAB for the 2014/15 to 2017/18 period is discussed in detail in Chapter 7 and summarised in Table 12.1.

Table 12.1
Revised Forecast Regulatory Asset Base ($m nominal)

RAB	2014/15	2015/16	2016/17	2017/18
Opening RAB	6,076.3	6,343.3	6,658.5	6,878.5
Net Capital Expenditure	358.3	421.0	340.8	340.8
Straight Line Depreciation	-243.2	-264.3	-287.3	-277.7
Inflation Adjustment	151.9	158.6	166.4	171.9
Closing RAB	**6,343.3**	**6,658.5**	**6,878.5**	**7,113.5**

Source: TransGrid. Totals may not add due to rounding.

12.1.2 Inflation Assumption

TransGrid has applied 2.50% inflation, based on the Reserve Bank of Australia November 2014 Statement of Monetary Policy forecast for 2014/15 and 2015/16 and the midpoint of the target inflation band of 2% to 3% per annum for the following eight years. This is consistent with the AER's preferred methodology.

12.1.3 Return on Capital

The return on capital has been calculated by applying the post-tax nominal vanilla WACC to the opening RAB in the respective year using the post-tax revenue model.

The revised post-tax nominal vanilla WACC of 8.65% was established using the methodology detailed in Chapter 8. This calculation is summarised in Table 12.2.

Table 12.2
Revised Return on Capital ($m nominal)

	2014/15	2015/16	2016/17	2017/18	Total
Opening RAB	6,076.3	6,343.3	6,658.5	6,878.5	
Return on Capital	**525.7**	**548.8**	**576.1**	**595.1**	**2,245.7**

Source: TransGrid.

12.1.4 Regulatory Depreciation

The revised regulatory depreciation, discussed in Chapter 9, is calculated using the PTRM and shown in Table 12.3.

Table 12.3
Revised Depreciation Forecast ($m nominal)

	2014/15	2015/16	2016/17	2017/18	Total
Regulatory Depreciation	91.3	105.8	120.9	105.8	423.7

Source: TransGrid.

12.1.5 Operating Expenditure

The revised forecast operating expenditure is discussed in Chapter 6. The forecast operating expenditure for 2014/15 to 2017/18 is summarised in Table 12.4.

Table 12.4
Revised Operating Expenditure Forecast ($m nominal)

	2014/15	2015/16	2016/17	2017/18	Total
Controllable Operating Expenditure	171.4	184.7	192.4	188.8	737.3
Debt Raising Costs	6.5	6.8	7.2	7.4	27.9
Insurance	6.1	6.8	7.6	8.5	29.0
Self Insurance	0.0	0.0	0.0	0.0	0.0
Network Support	0.0	0.0	0.0	0.0	0.0
Total	**184.0**	**198.4**	**207.1**	**204.6**	**794.2**

Source: TransGrid. Totals may not add due to rounding.

12.1.6 Efficiency Benefit Sharing Scheme

The revised efficiency benefit sharing scheme (EBSS) outcomes are discussed in Chapter 13. A summary of the efficiency carryover amounts is set out in Table 12.5.

Table 12.5
Revised Efficiency Carryover ($m nominal)

	2014/15	2015/16	2016/17	2017/18	Total
EBSS Carryover	23.1	8.6	10.9	19.8	62.4
ECFM Adjustment	0.0	5.6	5.8	5.9	17.3
Total Efficiency Carryover	**23.1**	**14.2**	**16.6**	**25.7**	**79.7**

Source: TransGrid. Totals may not add due to rounding.

12.1.7 Corporate Tax Allowance

The revised corporate tax allowance is set out in Chapter 10 and shown in Table 12.6.

Table 12.6
Revised Corporate Tax Allowance ($m nominal)

	2014/15	2015/16	2016/17	2017/18	Total
Tax Allowance	39.3	42.5	62.0	63.4	207.3

Source: TransGrid.

12.2 Maximum Allowed Revenue

TransGrid's proposed unsmoothed revenue requirement for each year of the regulatory control period is calculated as the sum of the building block components. Based on the

building blocks outlined in the previous sections, the revised unsmoothed revenue requirement for 2014/15 to 2017/18 is shown in Table 12.7.

Table 12.7
Revised Unsmoothed Revenue Requirement ($m nominal)

	2014/15	2015/16	2016/17	2017/18	Total
Return on Capital	525.7	548.8	576.1	595.1	2,245.7
Return of Capital (Regulatory Depreciation)	91.3	105.8	120.9	105.8	423.7
Operating Expenditure	184.0	198.4	207.1	204.6	794.2
Efficiency Carryover	23.1	14.2	16.6	25.7	79.7
Net Tax Allowance	39.3	42.5	62.0	63.4	207.3
Annual Building Block Revenue Requirement (Unsmoothed)	**863.4**	**909.7**	**982.8**	**994.6**	**3,750.5**

Source: TransGrid. Totals may not add due to rounding.

12.3 Smoothed Maximum Allowed Revenue

The unsmoothed revenue is required to be smoothed over the 2014/15 to 2017/18 period. The placeholder revenue that the AER has approved in its transitional decision is set to be the smoothed revenue for 2014/15. The difference between the placeholder revenue and the annual building block revenue for 2014/15 is adjusted as part of the smoothing process to establish the smoothed MAR for the 2015/16 to 2017/18 period.

Clause 11.58.4(c) of the Rules does not require the expected MAR in the last year of the regulatory control period to be as close as reasonably possible to the annual building block revenue requirement for that year as part of the transitional arrangement.

The revised smoothed revenue requirement and the x-factors over the 2014/15 to 2017/18 period are shown in Table 12.8.

Table 12.8
Revised Smoothed Revenue Requirement ($m nominal)

	2014/15	2015/16	2016/17	2017/18	Total
Unsmoothed Revenue	863.4	909.7	982.8	994.6	3,750.5
Smoothed Revenue	845.4	939.8	968.1	998.2	3,751.4
X-factor	**11.71%**	**-8.45%**	**-0.50%**	**-0.60%**	

Source: TransGrid.

12.4 Average Price Path

TransGrid determines its transmission charges based on the AER's approved revenue and the pricing principles in Clause 6A.23 of the Rules. The average price path is estimated using the AER's PTRM, by dividing the revenue requirement by the energy delivered in New South Wales forecast by AEMO. The AER has adopted the medium operational demand

forecast in its draft decision. TransGrid has adopted the same category data from AEMO's *National Electricity Forecasting Report* published by AEMO on 16 June 2014.[153]

In consumer engagement forums in 2014, consumers expressed concern regarding the accuracy of AEMO's energy and demand forecasts. In particular, if the actual consumption that eventuates is lower than the forecast, the indicative impact on prices would be understated.

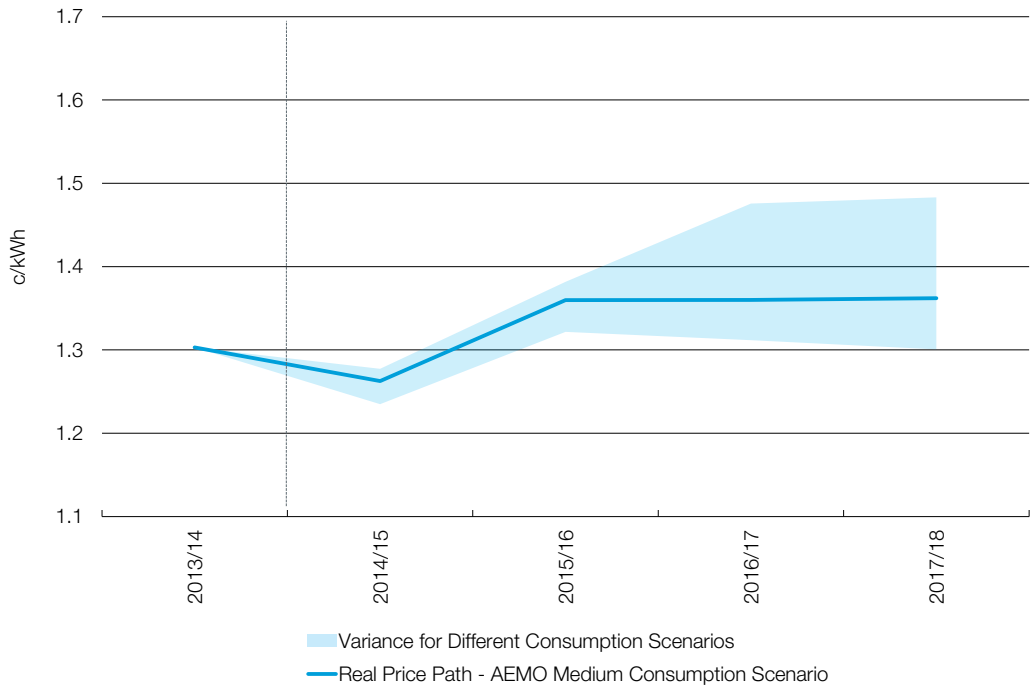
While forecasting is inherently challenging, most particularly during times of both technology change and economic uncertainty, TransGrid notes that AEMO has committed substantial effort to produce robust and defensible forecasts and is improving its techniques on an ongoing basis.

TransGrid also notes that the actual electricity consumption in NSW for July to October 2014 was 2.9% higher than AEMO's forecast in the 2014 *National Electricity Forecasting Report*.[154] This may alleviate concerns of consumption being lower than the forecast in the immediate future.

To assist consumers to understand potential price outcomes, TransGrid has shown the average price path with the variance for different consumption to provide an indication of a potential range of price outcomes. Price movements for individual customers may vary depending on usage and location.

The average price path over the 2014/15 to 2017/18 period is shown in Figure 12.1.

Figure 12.1
Average Price Path ($ 2013/14)



Source: TransGrid.

[153] AEMO, *National Electricity Forecasting Report*, June 2014. TransGrid notes that AEMO did not update the NSW forecasts in its *2014 NEFR Update* dated 17 December 2014.
[154] AEMO, *National Electricity Forecasting Report Update*, December 2014, p3.

13 Efficiency Benefit Sharing Scheme

The efficiency benefit sharing scheme provides incentives for transmission network service providers to make ongoing efficiency improvements in operating expenditure.

TransGrid has responded to the commercial drivers for cost control and the incentives provided by the efficiency benefit sharing scheme (EBSS). In the 2009/10 to 2013/14 regulatory control period, TransGrid has pursued efficiencies throughout its business, and as such has achieved an operating expenditure below the allowance set in the 2009/10 to 2013/14 revenue determination.

In its draft decision, the AER accepted TransGrid's operating expenditure in 2012/13 as efficient base year expenditure, and found no evidence of material inefficiency.[155] The AER was also of the view that TransGrid's operating expenditure profile over time is consistent with a business responding to incentives to reduce operating expenditure.[156]

13.1 Summary of Revenue Proposal

In the revenue proposal, TransGrid calculated the efficiency carryover from the EBSS in 2009/10 to 2013/14, and an adjustment to its predecessor, the efficiency carry forward mechanism (ECFM) for 2008/09.

TransGrid proposed to apply the EBSS for 2014/15 to 2018/19 using the mechanism set out in the AER's *Efficiency Benefit Sharing Scheme for Electricity Network Service Providers – November 2013* to categories of operating expenditure forecast using a base-step-trend method.

It proposed to apply an alternative mechanism to major operating projects (MOPS), on the basis that MOPS expenditure is more like capital expenditure in nature and can be highly variable, and is better forecast using a bottom-up method.

TransGrid also proposed exclusions for debt raising costs, insurance, self insurance, network support, demand management innovation allowance, employee entitlements and operating expenditure under the network capability incentive.

[155] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-31.
[156] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 7 – Operating Expenditure*, 27 November 2014, p7-32.

13.2 Summary of Draft Decision

In the draft decision, the AER recalculated the ECFM carryover from 2008/09 using its proposed rate of return for the 2014/15 to 2018/19 period. It also recalculated the EBSS carryover from 2009/10 to 2013/14, retrospectively reversing movements in provisions.

In its revenue proposal, TransGrid noted that it had not completed its expected level of easement maintenance in 2012/13, the base year for forecasting operating expenditure, due to a significant issue with the safety performance of an easement maintenance contractor. TransGrid proposed to reinstate $2 million of uncompleted easement maintenance into the base year in order to forecast expenditure, and in conjunction, reduce the savings in 2012/13 under the EBSS to ensure no double-recovery of the adjustment. In the draft decision, the AER did not reinstate the uncompleted easement maintenance into the base year, and also did not reduce the savings in 2012/13 under the EBSS.

In the draft decision, the AER set a carryover period of four years under the EBSS in 2014/15 to 2018/19. It accepted TransGrid's proposed exclusions for debt raising costs, network support, employer contributions for defined benefits superannuation and operating expenditure under the network capability incentive. However, it rejected TransGrid's proposed exclusions for insurance, self insurance, demand management innovation allowance and employee entitlements other than employer contributions for defined benefits superannuation.

The AER also rejected TransGrid's proposed alternative EBSS mechanism for major operating projects.

13.3 Response to Draft Decision

TransGrid accepts the draft decision on the carryover period of four years and the exclusion of debt raising costs, network support, employer contributions for defined benefits superannuation contributions and operating expenditure under the network capability incentive.

TransGrid also accepts the draft decision on the inclusion of employee entitlements other than defined benefits superannuation contributions in the EBSS.

TransGrid accepts the AER's decision not to adopt an alternative EBSS mechanism that is better suited to non-recurrent expenditure for major operating projects. However, TransGrid would like to work further with the AER and other stakeholders outside of the revenue determination process to consider the best forecasting methodology for non-recurrent operating expenditure.

TransGrid does not accept the draft decision on the other matters relating to the EBSS.

Accordingly, TransGrid addresses these matters in this revised revenue proposal. A summary of the matters addressed is set out in Table 13.1.

Table 13.1
Summary of Matters Addressed in Revised Proposal

Matter	AER Draft Decision	TransGrid Response
Discount rate for ECFM carry forward calculation	Update discount rate for 2014/15 onwards to rate of return in draft decision	Update discount rate for 2014/15 onwards to rate of return in revised revenue proposal
Calculation of EBSS carryover from 2009/10 to 2013/14	Reversed movements in provisions	Does not consider reversing movements in provisions is consistent with EBSS guideline and previous revenue determination
Reinstatement of uncompleted easement maintenance in base year	Did not reinstate, on basis that EBSS guideline version 1 does not allow it	It is preferable to reinstate uncompleted easement maintenance, because the forecast operating expenditure will then more accurately reflect TransGrid's forecast costs However, TransGrid accepts the AER's decision
Exclusions for insurance and self insurance	Should not be excluded from the EBSS, as the AER has forecast this using a revealed costs approach	Should be excluded from the EBSS As it was previously excluded, TransGrid did not receive EBSS benefits for reducing insurance costs in the last period but would receive EBSS penalties for increasing insurance costs in 2014/15 to 2018/19 for reasons outside its control if it is now included
Exclusion for operating expenditure under the demand management innovation allowance	Should not be excluded from the EBSS, as the AER has forecast this using a revealed costs approach	Should be excluded from EBSS, as an incentive to reduce expenditure in this category would be contrary to the value consumers have expressed for development of the demand management market

13.4 Efficiency Carryover from Previous Regulatory Control Period

In the draft decision, the AER accepted TransGrid's approach to the timing of the recovery of the ECFM adjustment and updated the discount rate to reflect the allowed rate of return in the draft decision.

In the revised proposal, TransGrid has updated the discount rate to reflect its proposed rate of return.

The revised adjustment is shown in Table 13.2.

Table 13.2
Revised ECFM Adjustment ($m nominal)

	2014/15	2015/16	2016/17	2017/18
ECFM Adjustment	0.0	5.6	5.8	5.9

Source: TransGrid.

13.5 Treatment of Movements in Provisions for Historical Carryover

In the draft decision, the AER reversed movements in provisions for employee entitlements when calculating the EBSS carryover amounts from the 2009/10 to 2013/14 regulatory control period. The AER stated that:

> We have calculated the EBSS carryover amounts for the 2009–14 regulatory control period by removing increases in provisions allocated to actual opex and replacing those amounts with the cost incurred out on such obligations. We consider the cost incurred in meeting such obligations represents the actual cost incurred in delivering prescribed transmission services in the regulatory control period.[157]

TransGrid considers that the version of the EBSS that applied to TransGrid in the 2009/10 to 2013/14 regulatory control period does not allow for a retrospective change to the methodology used to calculate the targets or actual expenditure, as the AER has done in the draft decision. The EBSS guideline states that:

> In calculating the benefits or losses to be carried over, the measurement of actual expenditure over the regulatory period must be done using the same cost categories and methodology used to calculate the forecast expenditure for that period.[158]

The AER has previously expressed the importance of measuring targets and actual expenditure on a consistent basis, including the same accounting treatment of employee entitlements, when applying the EBSS to ElectraNet and AusNet Services.[159]

In the 2009/10 to 2013/14 revenue determination, the AER did not reverse movements in provisions when determining the forecast operating expenditure allowance. That is, the operating expenditure allowance for 2009/10 to 2013/14 was based on a provisions approach to employee entitlements.

By reversing movements in provisions from actual expenditure for EBSS purposes, the AER is effectively comparing:

- actual expenditure on the basis of employee entitlements accounted for on a cash basis; with
- EBSS targets that were set on the basis of employee entitlements accounted for on a provisions basis.

TransGrid considers that this is not a valid comparison and is not allowed under the EBSS that applied to TransGrid in 2009/10 to 2013/14.

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[157] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 9 – Efficiency Benefit Sharing Scheme*, 27 November 2014, p9-11.
[158] AER, *Final Electricity Transmission Network Service Providers Efficiency Benefit Sharing Scheme*, September 2007, p
[159] AER, *Final Decision: ElectraNet Transmission Determination 2013-14 to 2017-18*, April 2013, p173 and AER, *Draft Decision: SP AusNet Transmission Determination 2014-15 to 2016-17*, pp193, 196.

Consistent with the EBSS guideline, as the EBSS targets were set using a provisions approach to employee entitlement costs, the performance against those targets must also be measured using a provisions approach.

As well as being set out in the EBSS guideline, the practice of changing incentives retrospectively is poor regulatory practice and increases regulatory risk for all businesses. A business cannot be incentivised by retrospective changes to a scheme, because the actions that are sought to be incentivised or disincentivised have already occurred.

On this basis, TransGrid considers that the AER cannot retrospectively exclude movements in provisions from the EBSS. Therefore, the carryover amounts in this proposal have been calculated without reversing movements in provisions. TransGrid recognises the AER's preference to adopt cash accounting estimates for this cost category going forward, and forecast employee entitlements on a cash basis in the revenue proposal.

13.6 Reinstatement of Base Year Costs

In the revenue proposal, TransGrid advised that in 2012/13 it had responded to a significant issue with the safety performance of an easement maintenance contractor and terminated the contract. The time required to establish the new contract led to an unavoidable eight month break in easement maintenance in part of the state, and $2 million of easement maintenance was not completed in 2012/13.

TransGrid proposed to make an adjustment to reinstate the uncompleted maintenance, for the purpose of establishing an efficient base year. TransGrid also made a commensurate reduction to the 2012/13 savings under the efficiency benefit sharing scheme, to ensure that there was no double-recovery of this adjustment.

In the draft decision, the AER stated that:

> In the 2009–14 regulatory control period, TransGrid was subject to version one of the EBSS. This version of the EBSS does not allow for such an adjustment to the carryover amounts. We must be satisfied the actual opex accurately reflects the costs faced by the NSP during the regulatory control period. Including a cost that was not incurred into the regulatory control period in the EBSS calculations is not consistent with how the EBSS is intended to operate.[160]

TransGrid accepts the AER's decision.

Despite this, TransGrid considers this to be a sub-optimum outcome. If the EBSS efficiency carryover is used as a substitute for part of the operating expenditure forecast, as the AER in effect proposes, then the operating expenditure forecast itself does not reflect the efficient costs that a prudent operator would require to achieve the operating expenditure objectives. The implications of this can be particularly significant, as TransGrid's actual operating expenditure over the 2014/15 to 2017/18 period will be measured against its allowance for operating expenditure in the AER's final decision, which would not include the partial substitute forecast within the EBSS efficiency carryover.

13.7 Revised Historical Performance

In the revenue proposal, TransGrid set out its EBSS targets for 2009/10 to 2013/14. The targets were revised downward from those in the 2009/10 to 2013/14 revenue determination to reflect the change in peak demand during that period. This reduces the benefit TransGrid earns from this period. The AER accepted these adjustments.

[160] AER, *Draft Decision: TransGrid Transmission Determination 2015-18, Attachment 9 – Efficiency Benefit Sharing Scheme*, 27 November 2014, p9-13.

TransGrid has updated its expected operating expenditure for 2013/14 to the actual operating expenditure, as the 2013/14 year is now complete. Due to the EBSS mechanism, this does not affect TransGrid's EBSS carryover until the next revenue determination. However, it is set out here for completeness.

TransGrid's revised performance against the adjusted EBSS targets in the 2009/10 to 2013/14 revenue determination are shown in Table 13.3.

The carryover amounts are shown in Table 13.4. While this revised revenue proposal forecasts expenditure to 2017/18, Table 13.4 includes the carryover amount of zero in 2018/19 to confirm there will be no carryover of the EBSS from 2009/10 to 2013/14 beyond this period.

Table 13.3
Revised Historical EBSS Performance ($m nominal)

	2009/10	2010/11	2011/12	2012/13	2013/14
EBSS Target	120.7	134.8	141.7	153.8	159.6
EBSS Target Adjusted for Change in Peak Demand	120.7	134.7	141.2	152.1	157.6
Actual Operating Expenditure under EBSS	108.0	123.3	136.9	130.5	153.7

Source: TransGrid.

Table 13.4
Revised EBSS Carryover ($m nominal)

	2014/15	2015/16	2016/17	2017/18	2018/19
EBSS Carryover	23.1	8.6	10.9	19.8	0.0

Source: TransGrid.

13.8 Exclusions of Insurance and Self Insurance

In the revenue proposal, TransGrid proposed to exclude insurance and self insurance from the EBSS on the grounds that these costs are largely non-controllable for the business and instead set by the external insurance market.

In the draft decision, the AER rejected TransGrid's exclusion of insurance and self insurance on the basis that these categories are included in its single year revealed cost approach to forecasting, and it saw no reason to exclude these costs from the EBSS.

In the 2009/10 to 2013/14 regulatory control period, the AER did exclude insurance and self insurance from the EBSS.[161]

From 2012/13, TransGrid switched its insurance cover from the commercial insurance market to the NSW Government self insurer, SICorp, when access to this cover was made available to TransGrid. SICorp manages the Treasury Managed Fund (TMF), and offers a more comprehensive level of insurance cover than that which TransGrid would be able to secure in the commercial market, at a cost that is well below commercial rates.

[161] AER, *Final Decision: TransGrid Transmission Determination 2009–10 to 2013–14*, 28 April 2009, pp101-102.

TransGrid has not received the benefit of an efficiency carryover for switching its insurance cover to SICorp from 2012/13 under the EBSS, as insurance and self insurance were both excluded from the EBSS. However, consumers are benefiting from TransGrid's initiative, as forecast operating expenditure for 2014/15 to 2017/18 is based on the significantly lower insurance premiums TransGrid can access through SICorp. This is the case under both TransGrid's bottom-up approach to forecasting insurance and the AER's base – step – trend approach, as TransGrid's insurance cover was procured through SICorp from 1 July 2012, that is, the whole of the base year.

TransGrid notes that in the event it is no longer able to access TMF insurance cover, its insurance and self insurance costs would increase by approximately $6.5 million per year, based on the commercial market and actuarially assessed self insurance forecasts from Marsh provided as Appendix T of the revenue proposal.

If insurance and self insurance are included in the EBSS going forward, TransGrid would incur a significant penalty under the EBSS should it no longer be able to access TMF insurance cover, for example, due to a change in ownership. This is clearly an event outside of TransGrid's control.

In order to avoid a significant penalty for an event outside of TransGrid's control, it proposes that insurance and self insurance be excluded from the EBSS in 2014/15 to 2017/18.

13.9 Exclusion of Demand Management Innovation Allowance

In the revenue proposal, TransGrid proposed the exclusion of operating expenditure under the demand management innovation allowance from the EBSS. In the draft decision, the AER rejected this exclusion, as it was not satisfied there is a reason to treat operating expenditure that TransGrid spends on demand management differently to the rest of its operating expenditure.

The purpose of the demand management innovation allowance is to pursue innovative approaches to encourage, investigate, develop, implement and evaluate demand management opportunities. Much of this expenditure is operating expenditure.

An incentive to reduce this expenditure is perverse, given that the nature of the expenditure is discretionary and supported by a cross-section of consumers as expressed in TransGrid's consumer engagement program. In TransGrid's demand management innovation forum and workshop on the draft decision, consumers generally indicated support for demand management innovation and a desire for TransGrid to proactively pursue developments in this area.

Therefore, TransGrid proposes that operating expenditure under the demand management innovation allowance be excluded from the EBSS.

14 Capital Expenditure Sharing Scheme

The capital expenditure sharing scheme provides incentives for transmission network service providers to deliver efficient capital expenditure.

14.1 Summary of Revenue Proposal

In the revenue proposal, TransGrid proposed to apply the CESS using the mechanism set out in the AER's *Capital Expenditure Incentive Guideline for Electricity Network Service Providers – November 2013*.

TransGrid proposed to exclude employee entitlements and specific allowances from the CESS, consistent with its proposal for the EBSS, to ensure balanced incentives between operating expenditure and capital expenditure. TransGrid proposed exclusions for:

- equity raising costs;
- demand management innovation allowance, where expenditure under the allowance is classified as capital expenditure;
- employee entitlements; and
- capital expenditure under the network capability incentive.

14.2 Summary of Draft Decision

In the draft decision, the AER accepted TransGrid's proposal to apply the CESS using the mechanism set out in the capital expenditure incentives guideline. It also accepted the exclusion of capital expenditure under the network capability incentive.

The AER rejected TransGrid's proposed exclusions for equity raising costs, capital expenditure under the demand management innovation allowance and employee entitlements.

14.3 Response to Draft Decision

TransGrid accepts the draft decision on the CESS mechanism and exclusion of capital expenditure under the network capability incentive.

TransGrid accepts the draft decision on the exclusion of employee entitlements, on the basis that it will provide a consistent sharing ratio over time. TransGrid considers that this will create an imbalance between the CESS and EBSS for categories of employee entitlements that are excluded from the EBSS, such as employer contributions for defined benefits superannuation. However, TransGrid also notes that the allocation of costs between capital and operating expenditure is governed by accounting standards, which should alleviate concerns of potential for cost shifting.

TransGrid does not accept the draft decision on the rejection of exclusion of equity raising costs and capital expenditure under the demand management innovation allowance.

Accordingly, TransGrid addresses these matters in this revised revenue proposal. A summary of the matters addressed is set out in Table 14.1.

Table 14.1
Summary of Matters Addressed in Revised Proposal

Matter	AER Draft Decision	TransGrid Response
Exclusion of equity raising costs	Should not be excluded from the CESS, as the CESS is not predicated on addressing incentives resulting from a revealed cost forecasting approach	Should be excluded from the CESS, as they are based on benchmark efficient costs and not included in forecast capital expenditure
Exclusion of capital expenditure under the demand management innovation allowance	Should not be excluded from the CESS, as not satisfied there is a reason to treat differently	Should be excluded from CESS, as an incentive to reduce costs would be contrary to the value consumers have expressed for development of the demand management market

14.4 Exclusion of Equity Raising Costs

In the revenue proposal, TransGrid proposed the exclusion of equity raising costs from the CESS. In the draft decision, the AER rejected this exclusion, arguing that it is not required because the CESS is not predicated on addressing incentives resulting from a revealed cost forecasting approach, as is the case with the EBSS.

TransGrid proposes to exclude equity raising costs from the CESS for two reasons.

Firstly, as with debt raising costs, equity raising costs are determined with reference to a benchmark efficient firm, consistent with the determination for the rate of return. These costs are already subject to the incentive to source capital at a more competitive rate than the benchmark rate of return, and do not require additional incentives.

Secondly, while the AER has set a precedent of treating equity raising costs as a part of the regulatory asset base, they have not been included in forecast capital expenditure. The AER stated in TransGrid's last revenue determination:

> TransGrid proposed including equity raising costs as part of its forecast opex allowance. The AER considers that there is merit in treating the equity raising cost allowance as a part of TransGrid's RAB—that is, to amortise the allowance. This would improve transparency, given

that the nature of the allowance is associated with capex, and ensure that future revenue resets for TransGrid would be administratively simpler in the provision of such an allowance.[162]

As equity raising costs are not included in forecast capital expenditure, they are not included in the CESS targets. Therefore, they should not be included in the actual expenditure measured under the CESS. For the avoidance of doubt, TransGrid proposes that equity raising costs be excluded from the CESS.

14.5 Exclusion of Capital Expenditure Under the Demand Management Innovation Allowance

In the revenue proposal, TransGrid proposed the exclusion of capital expenditure under the demand management innovation allowance from the CESS. In the draft decision, the AER rejected this exclusion, as it was not satisfied there is a reason to treat capital expenditure that TransGrid spends on demand management differently to the rest of its capital expenditure.

The purpose of the demand management innovation allowance is to pursue innovative approaches to encourage, investigate, develop, implement and evaluate demand management opportunities. While much of this expenditure is operating expenditure, as the AER has noted in the draft decision, some of the initiatives may involve some minor capital expenditure.

Consistent with its proposal for the EBSS, TransGrid proposes to exclude capital expenditure under the demand management innovation allowance from the CESS. This is because the purpose of the demand management innovation allowance is to undertake initiatives of a research and development nature in order to develop the demand management market. Consumers have generally indicated their support for demand management innovation and a desire for TransGrid to proactively pursue developments in this area.

The inclusion of the demand management innovation allowance would provide an incentive that is contrary to the value consumers have expressed for development of the demand management market – that is, to reduce expenditure on demand management innovation.

TransGrid therefore proposes that capital expenditure under the demand management innovation allowance be excluded from the CESS.

[162] AER, *Final Decision: TransGrid Transmission Determination 2009-10 to 2013-14*, 28 April 2009, p96.

15 Service Target Performance Incentive Scheme

The service target performance incentive scheme provides incentives for transmission network service providers to improve and maintain the performance of the network.

The service target performance incentive scheme (STPIS) for transmission has three components: a service component, market impact component and network capability component.

For the service component, the values and weightings for each parameter are set in the revenue determination.

For the market impact component, the values are set based on a rolling average of recent historical performance. Therefore, they are not required to be proposed in a revenue proposal or set in a revenue determination.

For the network capability component, TransGrid is required to submit a Network Capability Incentive Parameter Action Plan (NCIPAP) with its revenue proposal. The NCIPAP comprises minor projects that will improve the capability of the network in terms of both the elements most important to determining spot prices and the times when users place the greatest value on the reliability of the system.

15.1 Summary of Revenue Proposal

In the revenue proposal, TransGrid proposed targets, caps, collars and weightings for each parameter under the service component.

TransGrid also submitted a NCIPAP comprising 28 projects that will improve the capability of the network in terms of both the elements most important to determining spot prices and the times when users place the greatest value on the reliability of the system.

15.2 Summary of Draft Decision

In the draft decision, the AER accepted TransGrid's proposed performance targets for the service component but did not accept the proposed caps and collars. The AER proposed alternative caps and collars derived using a different statistical methodology.

In relation to the market impact component, the AER listed a number of adjustments it made to TransGrid's 2011, 2012 and 2013 market impact performance data.

The AER also accepted TransGrid's proposed priority projects and improvement targets in the NCIPAP under the network capability component.

15.3 Response to Draft Decision

TransGrid considers that the AER's discussion on the statistical methodology used to set the caps and collars for the service component is somewhat splitting hairs, particularly when applying statistical methods to sample sizes as small as five data points.

However, TransGrid accepts the draft decision on all components of the STPIS and does not address any matters relating to the STPIS in this revised proposal.

By accepting the draft decision, the targets, caps and collars for the service component are shown in Table 15.1. The weightings applied are those that have been set in the STPIS guideline.

Table 15.1
Proposed Service Component Values

Parameter	Collar	Target	Cap	Weighting
Average Circuit Outage Rate				
Line Outage – Fault	22.26%	17.86%	12.38%	0.20
Transformer Outage – Fault	19.01%	14.92%	10.26%	0.20
Reactive Plant Outage – Fault	22.73%	15.54%	9.54%	0.10
Line Outage – Forced	25.49%	14.98%	1.34%	0
Transformer Outage – Forced	24.15%	20.25%	15.56%	0
Reactive Plant Outage – Forced	28.55%	20.39%	6.55%	0
Loss of Supply Event Frequency				
> 0.05 System Minutes	4	3	2	0.15
> 0.25 System Minutes	2	1	0	0.15
Average Outage Duration	266.53	144.49	67.97	0.20
Proper Operation of Equipment	N/A	N/A	N/A	0

Source: TransGrid and AER.

16 Pass Through Events

Cost pass through arrangements provide for adjustments to allowed revenue if a non-controllable predefined event occurs that leads to a material change in TransGrid's costs.

This chapter presents the identified risks that TransGrid proposes be treated as cost pass through events for the upcoming regulatory control period.

16.1 Summary of Revenue Proposal

TransGrid's proposal on pass through events was discussed in detail in Chapter 17 of the revenue proposal. Clause 6A.7.3 of the Rules provides the following prescribed pass through events for all TNSPs:

- regulatory change event;
- service standard event;
- tax change event; and
- insurance event.

In addition to the above events, TransGrid has identified the following unpredictable, high cost events to be nominated as pass through events for 2015/16 to 2017/18 period:

- insurance cap event;
- terrorism event;
- insurer default event;
- cyber-related external attack; and
- gradual environmental contamination event.

16.2 Summary of Draft Decision

In the draft decision, the AER amended the definitions for the insurance cap event and terrorism event.

The AER rejected the proposed pass through events of insurer default event, cyber-related external attack and gradual environmental contamination event.

16.3 Response to Draft Decision

TransGrid does not accept the AER's draft decision. TransGrid has proposed further amendments to the definitions for the insurance cap event and terrorism event. It has also proposed pass through events of insurer default event, cyber-related external attack and gradual environmental contamination event with further justification in this revised proposal.

A summary of the matters addressed is set out in Table 16.1.

Table 16.1
Summary of Matters Addressed in Revised Proposal

Matter	AER Draft Decision	TransGrid Response
Insurance cap event	Added clauses defining relevant policy limits	As TransGrid currently has unlimited insurance cover through SICorp, the wording of the clauses unfairly restricts the ability for TransGrid to make an application for cost pass through, should TransGrid's insurance arrangements necessarily change in the future TransGrid has proposed alternative wording
Terrorism event	Added clauses to consider the extent to which TransGrid's insurance cover includes terrorism when assessing this event	The Australian Reinsurance Pool is a generally recognised form of cover and prudent NSPs would not seek additional cover
Insurer default event	Did not accept, on the basis that a prudent service provider could reasonably prevent an event of that nature from occurring	This is a reasonable risk that should be allowed for as a pass through event The AER has cited indicators that do not provide any assurance that an insurance company will not default
Cyber-related external attack	Did not accept, on the basis that the event is not clearly defined, TransGrid did not explain how it has taken steps to mitigate such an attack, and TransGrid has not explained why insurance would not be available	TransGrid has provided additional information to address the AER's concerns, and can provide further detailed information confidentially if required TransGrid has included this pass through event in this revised proposal
Gradual environmental contamination event	Did not accept, on the basis that the event is not clearly defined, TransGrid did not explain how it has taken steps to mitigate such an event, and TransGrid has not explained why insurance would not be available	TransGrid believes that the risk of gradual environmental contamination is a risk that cannot be adequately covered in alternative ways, and therefore should be a legitimate pass through event

16.4 Insurance Cap Event

In the draft decision, the AER amended TransGrid's proposed definition for an insurance cap event by including additional clauses 4 and 5:

> An insurance cap event occurs if:

1. TransGrid makes a claim or claims and receives the benefit of a payment or payments under a relevant insurance policy;
2. TransGrid incurs costs beyond the relevant policy limit; and
3. the costs beyond the relevant policy limit materially increase the costs to TransGrid in providing direct control

For this insurance cap event:

4. the relevant policy limit is the greater of:
    a. TransGrid's actual policy limit at the time of the event that gives, or would have given rise to a claim; and
    b. the policy limit that is explicitly or implicitly commensurate with the allowance for insurance premiums that is included in the forecast operating expenditure allowance approved in the AER's final decision for the regulatory control period in which the insurance policy is issued.
5. a relevant insurance policy is an insurance policy held during the 2015-19 regulatory control period or a previous regulatory control period in which TransGrid was regulated.

Note for the avoidance of doubt, in assessing an insurance cap event cost pass through application under Rule 6A.7.3, the AER will have regard to:

i. the insurance policy for the event;
ii. the level of insurance that an efficient and prudent NSP would obtain in respect of the event; and
iii. the extent to which a prudent provider could reasonably mitigate the impact of the event.

TransGrid acknowledges the AER's acceptance of clauses 1, 2 and 3, although it considers that "direct control" in clause 3 should be replaced with "prescribed transmission services". TransGrid considers that the removal of wording "in providing prescribed transmission services" is inappropriate for a transmission network service provider. As per the National Electricity Rules Chapter 10, the reference to direct control services relates to distribution services and does not apply to TransGrid. As such, it is more appropriate to retain the reference to prescribed transmission services.

However TransGrid does not accept the additional clauses 4 and 5 that the AER has added in the draft decision. The additional clauses provide unfair restrictions to the ability for TransGrid to make an application for cost pass through, should TransGrid's insurance arrangements necessarily change in the future.

Clause 4

TransGrid is currently able to access the NSW Government's self-insurer, SICorp, which provides an uncapped insurance coverage. TransGrid is concerned that the policy limit assessment set out in this clause unreasonably restricts the ability to claim a pass through for an insurance cap event should TransGrid need to revert to the general insurance market during the regulatory control period. Uncapped coverage is generally not available from the general insurance market and yet the AER's proposal defines the minimum level of coverage before pass through may apply to match the caps that currently apply, that is, unlimited.

TransGrid's proposed insurance premium allowance included in the operating expenditure is calculated based on the current insurance arrangement, which is priced below market rates for general insurance. Under this circumstance, the insurance cap event could not be triggered. However should TransGrid lose access to SICorp, it will be required to purchase

insurance in the general insurance market and the insurance cap event will become applicable. Therefore the policy limit for this event should be based on the actual policy limit from the general insurance market at the time of the event or policy limits that were in place prior to 1 July 2012 and placed in the general insurance market. The key risks and relevant limits including a number of certificates of currency are provided in Appendix X.

Clause 5

This clause prescribes that the relevant insurance policy is one that would apply during the regulatory control period. As TransGrid currently has access to unlimited cover through SICorp, this is considered unreasonable as it would restrict the ability to claim if TransGrid were to change its insurance arrangement with limits applying. TransGrid considers it prudent to refer to a relevant insurance policy as one that is from the general insurance market held by TransGrid during a regulatory control period in which TransGrid was regulated.

TransGrid proposes the revised description for the insurance cap event to be as follows:

An insurance cap event occurs if:

1. TransGrid makes a claim or claims and receives the benefit of a payment or payments under a relevant insurance policy;
2. TransGrid incurs costs beyond the relevant policy limit; and
3. the costs beyond the relevant policy limit materially increase the costs to TransGrid in providing prescribed transmission network services.

For this insurance cap event:

4. the relevant policy limit is TransGrid's actual policy limit at the time of the event that gives, or would have given rise to a claim; and
5. a relevant insurance policy is an insurance policy from the general insurance market held during the 2014/15 to 2017/18 period or a previous regulatory control period in which TransGrid was regulated, with the limit being whichever is the greater amount.

Note for the avoidance of doubt, in assessing an insurance cap event cost pass through application under Rule 6A.7.3, the AER will have regard to:

i. the insurance policy for the event;
ii. the level of insurance that an efficient and prudent NSP would obtain in respect of the event; and
iii. the extent to which a prudent provider could reasonably mitigate the impact of the event.

16.5 Terrorism Event

In the draft decision, the AER has proposed an amendment to the definition of the terrorism event. It has deleted some words as marked up and added the note.

> 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 materially increases the costs to TransGrid ~~in providing prescribed transmission services or the costs~~ of providing direct control services.

Note: In assessing a terrorism event pass through application, the AER will have regard to, amongst other things:

i. whether TransGrid has insurance against the event;

ii. the level of insurance that an efficient and prudent NSP would obtain in respect of the event;

iii. whether a declaration has been made by a relevant government authority that a terrorism event has occurred; and

iv. the extent to which a prudent provider could reasonably mitigate the impact of the event.

In 2003 the Federal Government established the Australian Reinsurance Pool under the Terrorism Insurance Act 2003. Under this legislation, a levy is applied to insurance premiums and the levy is paid to the pool. The pool was established in response to international events and recognising that the impact of such events may not be adequately covered by the general insurance market.

Since this time, coverage for terrorism events is generally provided via this pool rather than through the general insurance market, although the pool is designed to provide property damage and associated business interruption cover in the event of a declared terrorist incident. Accordingly, it is considered appropriate that the AER recognise that the pool is a generally recognised form of cover and that prudent NSPs would not seek additional cover.

TransGrid considers that the removal of wording “in providing prescribed transmission services or the costs” is inappropriate for a transmission network service provider. As per the National Electricity Rules Chapter 10, the reference to direct control services relates to distribution services and does not apply to TransGrid. As such, it is more appropriate to retain the reference to prescribed transmission services.

Accordingly, TransGrid proposes that the revised description for the terrorism event should be as follows:

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 materially increases the costs to TransGrid 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 TransGrid has insurance against the event, including insurance levy paid to Australian Reinsurance Pool,

ii. the level of insurance that an efficient and prudent NSP would obtain in respect of the event,

iii. whether a declaration has been made by a relevant government authority that a terrorism event has occurred, and

iv. the extent to which a prudent provider could reasonably mitigate the impact of the event.

16.6 Insurer Default Event

In the draft decision, the AER did not accept the insurer default event as a pass through event because a prudent service provider could reasonably prevent an event of that nature from occurring.[163]

TransGrid, like many other entities, placed insurance with HIH prior to HIH being placed into liquidation. The AER has indicated that:

> We consider that a prudent service provider should have appropriate incentives to use an insurance provider that has the capacity to satisfy any claims under a policy. NSPs can assess the viability of an insurer by reviewing its track record, size, credit rating and reputation. If we allow an insurer default event we may encourage NSPs to obtain insurance from providers who are not capable of paying large claims. Under this scenario, in the event that the insurance provider fails and a claim is made, the NSP may simply seek a pass through of the costs.[164]

In particular, "HIH Insurance had an investment-grade rating only a few weeks before it became insolvent".[165] HIH would have satisfied the criteria of track record, size, credit rating and reputation, and prospective insureds would have continued to place insurance or would have had past insurance with HIH.

TransGrid considers that the AER has cited indicators that do not provide any assurance that an insurance company will not default after an insured has placed insurance even for a company that at the time was considered to have a good track record, has size and capacity to meet claims, and has a good credit rating and reputation. The risk is twofold for a TNSP:

1. the failure of an insurer to make payments under a policy claim; and
2. the risk that a prudent service provider may need to pay an additional premium to another insurer for coverage following an insurer moving into a state of not meeting satisfactory credit rating after payment of the premium. This would result in a significant increase in a premium in one year.

Accordingly, TransGrid considers that this is a reasonable risk that should be allowed for as a pass through event. TransGrid proposes a revised description to the insurer default event to be as follows:

Default of an insurer from which TransGrid is unable to recover its outstanding insurance claims. The insurer must be of investment grade credit rating at the time of insurance placement, had no previous default record and would be recognised as having sufficient capacity to meet all potential claims.

[163] *National Electricity Rules*, Chapter 10 (glossary), definition of 'nominated pass through event considerations', paragraph (c).
[164] AER, *Draft Decision: TransGrid Transmission Determination 2015-16 to 2017-18 – Attachment 13: Pass Through Events*, November 2014, p13-12.
[165] Reserve Bank of Australia Bulletin, April 2004, p12.

16.7 Cyber-related External Attack

In the revenue proposal, TransGrid proposed cyber-related external attack to be one of the nominated pass throughs events. The proposed description of the event was cyber-related external attack resulting in direct or third party losses to TransGrid.

In its draft decision, the AER did not accept the cyber-related external attack event as a pass through event because it considered that:

- The event proposed by TransGrid is not clearly and sufficiently defined.[166] A broad range of events could fall within the description of the proposed event.
- TransGrid did not provide detailed explanation of steps it has taken to prevent or mitigate such an attack from occurring.[167] Many organisations have been, and are subject to cyber related attacks. Given the risk of cyber-attacks, prudent firms would invest in securing their assets from such attacks. TransGrid is provided with an allowance for IT expenditure that should be used, in part, for securing its assets from events such as cyber-attacks. TransGrid did not explain why this allowance would be insufficient and why it would need a nominated pass through event as well. In our view, TransGrid is in a better position than consumers to bear the risk of this type of event.
- TransGrid has not satisfactorily explained why insurance would not be available.[168] It has provided some explanation as to principles which it would use to consider events to be nominated for pass throughs.[169] However, it has not explained why it could not insure against the event. As set out in section 13.5 we consider that where the NSP can take actions to limit the magnitude of the event then it should have incentives to manage the risk. If there is too much reliance on ex post measures the NSP has disincentives to take prudent actions to manage these risks. The potential to recover costs by way of a pass through should not form the basis of any risk management decision by the NSP.

TransGrid has designed its systems so as to mitigate the risk of cyber related external attacks. This includes review and testing by recognised security experts and ongoing management of IT systems by internal IT security experts complemented with external resources. TransGrid's actions are considered to be good practice. Further detailed information can be provided to the AER in confidence if required. The main cyber-related risk TransGrid is referring to are those that may impact the high voltage electricity network. In addition it continues to monitor and invest in system controls to protect against infiltration. However as is highlighted in the Marsh attachment, included as Appendix Y, there continues to be examples throughout the world of highly sophisticated cyber actions against utilities despite the best endeavours of utility operators.

The general insurance market has traditionally structured policies around privacy related protections, and in more recent times this has been expanded to cover cyber security. Recently there have been some moves towards some form of coverage being incorporated into general property coverage, although the extent of cover is limited to subsequent damage. In the past TransGrid has not taken out this cover, given the focus on privacy and not the main risk associated with the high voltage electricity network. TransGrid continues to explore the possible relevant covers available with the insurance companies on an ongoing basis.

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[166] *National Electricity Rules*, Chapter 10 (glossary), definition of 'nominated pass through event considerations', paragraph (b).
[167] *National Electricity Rules*, Chapter 10 (glossary), definition of 'nominated pass through event considerations', paragraph (c).
[168] *National Electricity Rules*, Chapter 10 (glossary), definition of 'nominated pass through event considerations', paragraph (d).
[169] TransGrid, *Revenue proposal Appendix T Insurance and Self Insurance Market Estimate*, 2 June 2014, p8.

TransGrid firmly believes that it has exhausted every effort that a prudent NSP could take to prevent or mitigate such an attack from occurring.

TransGrid proposes to amend the description for cyber-related external attack event to address the AER's concern as follows:

> Cyber-related external attack resulting in direct or third party losses to TransGrid in relation to an attack on the high voltage electricity network.
>
> Note: in assessing the cyber-related external attack application, the AER will have regard to:
>
> i. whether TransGrid has appropriate processes and procedures in place to prevent or mitigate such an attack from occurring
>
> ii. whether TransGrid has followed the processes and procedures
>
> iii. the extent to which a prudent provider could reasonably mitigate the impact of the event.

16.8 Gradual Environmental Contamination Event

In the revenue proposal, TransGrid sought a pass through for gradual environmental contamination event.

TransGrid is exposed to a number of environmental risks, each of which could lead to a range of legal and financial consequences for TransGrid. This may include settlement of claims by an individual or group of individuals who have suffered health effects or financial losses, legal costs associated with negotiating that settlement, and the cost of remediation of any contaminated site.

In the draft decision, the AER did not accept the gradual environmental contamination event as a pass through event because it considered that:

- The event proposed by TransGrid is not clearly defined. A broad range of events could fall within the description of the event.
- TransGrid did not provide detailed explanation of steps it has taken to prevent or mitigate such an event from occurring. In our view, TransGrid is in a better position than consumers to bear the risk of this type of event.
- The proposed event would allow TransGrid to recover the costs of events caused by TransGrid. There may be situations where we would allow a pass through for events caused by TransGrid, for example, past practices may have been commonly accepted practice at the time but are not acceptable today. However, the event proposed could allow TransGrid to have disregard for the consequences of its actions today. As noted in section 13.3, if the NSP has a degree of control, a pass through can remove or dilute the incentive to manage the risk.
- Many organisations have been, and are subject to environmental issues. Given the risks of environmental issues, prudent firms would be actively seeking out and identifying potential risks. TransGrid has not demonstrated any such processes it has implemented to make itself aware of these events and mitigate the risks of these events.
- TransGrid has not satisfactorily explained why it does not consider insurance would be available. It has provided some explanation as to principles which it would use to consider events to be nominated for pass throughs. However, it has not explained why it could not insure against the event. A prudent operator should take out an appropriate level of insurance, including public liability insurance, to cover claims resulting from these types of events. If there is too much reliance on ex post measures the NSP has disincentives to take

prudent actions to manage these risks. The potential to recover costs by way of a pass through should not form the basis of any risk management decision by the NSP.

The nature of a transmission service provider's operation involves a broad range of activities that have spanned many years. While all practices are conducted within environmental rules and regulations, there is potential that for some past practices although in accordance with the regulations of the time, may have future environmental impact.

In the past, when TransGrid acquired insurance from the general insurance market, and under its current insurance arrangement with SICorp, both coverages exclude gradual environmental damage.

The exclusion clauses from both are provided below:

General Insurance

10. POLICY EXCLUSIONS

No indemnity is granted by this policy against liability:-

10.1. (a) Personal Injury or bodily injury or loss of, damage to, or loss of use of property directly or indirectly caused by seepage, pollution or contamination, provided always that this paragraph (a) shall not apply to liability for Personal Injury or bodily injury or loss of or physical damage to or destruction of tangible property, or loss of use of such property damaged or destroyed, where such seepage, pollution or contamination is caused by a sudden, unintended and unexpected happening during the period of this Insurance.

(b) The cost of removing, nullifying or cleaning-up seeping, polluting contaminating substances unless the seepage, pollution or contamination is caused by a sudden, unintended and unexpected happening during the period of this Insurance.

(c) Fines, penalties, punitive or exemplary damages.[170]

NSW Government Self Insurer – SICorp

4.3 General exclusions to cover under clauses 4.1 and 4.2

The TMF will not cover a TMF Agency, or an employee of a TMF Agency, under clause 4.1, or a Covered Person under clause 4.2, for any liability, damages, costs or expenses:

(c) arising from any pollution or contamination to persons, property or the environment emanating from the TMF Agency's operations, unless wholly sudden and accidental and not preventable by reasonable precautionary maintenance.

(d) arising from pollution or contamination to property owned, leased or occupied by the TMF Agency where that pollution or contamination existed before the TMF Agency became the owner, lessee or occupier of the property.[171]

While TransGrid is not aware of any gradual environmental issues, they may exist. Under general insurance arrangements there is only limited coverage available.

TransGrid performs its activities in accordance with strict environmental practices. These practices include purchase of equipment that meets environmental standards, facilities that are designed with environmental controls in the event of equipment failure and ongoing monitoring of sites and equipment. However, there is potential exposure from past practices for which insurance is not readily available, and identification of such exposures is not

[170] Extract of TransGrid Primary Liability Cover 2009/10.
[171] NSW Treasury Managed Fund *Statement of Cover* Version 4.

economically viable. While some forms of environmental pollution coverage are available, TransGrid has not taken this cover as it has been relatively narrow and at a high premium. Therefore, TransGrid considers this to be a prudent action.

Accordingly, TransGrid believes that the risk of gradual environmental contamination is a risk that cannot be adequately covered in alternative ways, and therefore should be a legitimate pass through event.

Glossary

Acronym/Term	Definition
ACT	Australian Capital Territory
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ALS	Aerial Laser Survey
AMCL	Asset Management Consulting Limited
AOFM	Australian Office of Financial Management
AS 7000	Australian Standard 7000: Overhead Line Design – Detailed Procedures
BVAL	Bloomberg Valuation Service
C(b)1	The standard on overhead line design that preceded AS 7000
Capex	Capital Expenditure
CAPM	Capital Asset Pricing Model
CBD	Central Business District
CESS	Capital Expenditure Sharing Scheme
CGS	Commonwealth Government Securities
CPI	Consumer Price Index
DC	Direct Current
DGM	Dividend Growth Model
DNSP	Distribution Network Service Provider
DRP	Debt Risk Premium
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation
EBSS	Efficiency Benefit Sharing Scheme
ECFM	Efficiency Carry Forward Mechanism

Acronym/Term	Definition
EGWWS	Electricity, Gas, Water and Waste Services
EMCa	Energy Market Consulting associates
FRN	Floating Rate Note
ISO 55001	International Standards Organisation 55001: Asset Management – Management Systems – Requirements
Guideline	Rate of Return Guideline
GWh	Giga Watt Hour
ICT	Information, Operating and Communications Technology
IT	Information Technology
kV	Kilo Volts
kW	Kilo Watt
kWh	Kilo Watt Hours
MAR	Maximum Allowed Revenue
MOPS	Major Operating Projects
MRP	Market Risk Premium
MTFP	Multilateral Total Factor Productivity
MVA	Mega Volt Amps
MW	Mega Watt
MWh	Mega Watt Hours
NCIPAP	Network Capability Incentive Parameter Action Plan
NEM	National Electricity Market
NERA	NERA Economic Consulting
NSP	Network Service Provider
NSW	New South Wales
Opex	Operating Expenditure
OPGW	Optical Ground Wire
PCBU	Person Conducting a Business or Undertaking
PPI	Partial Performance Indicator
PTRM	Post-Tax Revenue Model
Qld	Queensland
RAB	Regulatory Asset Base
RBA	Reserve Bank of Australia

Acronym/Term	Definition
RFM	Roll Forward Model
RFR	Risk Free Rate
RIN	Regulatory Information Notice
RIT-T	Regulatory Investment Test for Transmission
Rules	National Electricity Rules
SA	South Australia
SICorp	NSW Self Insurance Corporation
SL CAPM	Sharpe-Lintner Capital Asset Pricing Model
STPIS	Service Target Performance Incentive Scheme
TAB	Tax Asset Base
TAPR	Transmission Annual Planning Report
Tas	Tasmania
TFP	Total Factor Productivity
TMF	Treasury Managed Fund
TNI	Transmission Node Identifier
TNSP	Transmission Network Service Provider
TW	Tera Watt
TWh	Tera Watt Hour
UK	United Kingdom
UTS	University of Technology Sydney
Vic	Victoria
WACC	Weighted Average Cost of Capital
WPI	Wage Price Index

Appendices

Appendix	Topic	Author
A	Assessment of Consumer Engagement Process	UTS
B	Report on Consumer Engagement in 2014	TransGrid
C	Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change	HoustonKemp
D	Real Labour Cost Escalation Forecasts to 2018/19	BIS Shrapnel
E	AMCL Review of EMCa's Report to the Australian Energy Regulator	AMCL
F	Response to EMCa Report	TransGrid
G	Approach to Low Span Remediation	TransGrid
H	Opex Forecasting Method	Frontier Economics
I	Inflation Adjustment to the Opex Model	HoustonKemp
J	Corrections and Updates to the AER's Opex Forecast	TransGrid
K	Consumer Engagement Step Change	TransGrid
L	Demand Management Innovation Step Change	TransGrid
M	Debt Raising Transaction Costs – Updated Report	Incenta
N	AER Draft Determination – Debt Raising Costs	Ashurst
O	Grant Samuel Response to AER Draft Decision	Grant Samuel
P	TransGrid Cost of Debt Transition	Frontier Economics
Q	Response to the Draft Decision on the Return on Debt Allowance	HoustonKemp
R	Analysis of Liquidity of Interest Rate Swaps	UBS
S	Experience in the Interest Rate Swap Market	Australian Office of Financial Management
T	TransGrid's Debt Management Practice	TransGrid

Appendix	Topic	Author
U	Statement on the Development of TransGrid's Debt Management Policy	TransGrid
V	Proposed Averaging Period (CONFIDENTIAL)	TransGrid
W	Depreciation Schedule	TransGrid
X	Pass Through Events: Key Risks and Relevant Limits (CONFIDENTIAL)	TransGrid
Y	Addendum to Marsh Report	Marsh
Z	Pricing Methodology Update	TransGrid
AA	Pricing Methodology	TransGrid

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