



FINAL DECISION
TransGrid transmission
determination
2015–16 to 2017–18

Attachment 7 – Operating
expenditure

April 2015

© Commonwealth of Australia 2015

This work is copyright. In addition to any use permitted under the Copyright Act 1968, all material contained within this work is provided under a Creative Commons Attributions 3.0 Australia licence, with the exception of:

- the Commonwealth Coat of Arms
- the ACCC and AER logos
- any illustration, diagram, photograph or graphic over which the Australian Competition and Consumer Commission does not hold copyright, but which may be part of or contained within this publication. The details of the relevant licence conditions are available on the Creative Commons website, as is the full legal code for the CC BY 3.0 AU licence.

Requests and inquiries concerning reproduction and rights should be addressed to the:

Director, Corporate Communications
Australian Competition and Consumer Commission
GPO Box 4141, Canberra ACT 2601

or publishing.unit@acc.gov.au.

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 520
Melbourne Vic 3001

Tel: (03) 9290 1444

Fax: (03) 9290 1457

Email: AERInquiry@aer.gov.au

AER reference: 53444

Note

This Attachment forms part of the AER's final decision on TransGrid's revenue proposal 2015–18. It should be read with other parts of the final decision.

The final decision includes the following documents:

Overview

Attachment 1 – maximum allowed revenue

Attachment 2 – regulatory asset base

Attachment 3 – rate of return

Attachment 4 – value of imputation credits

Attachment 5 – regulatory depreciation

Attachment 6 – capital expenditure

Attachment 7 – operating expenditure

Attachment 8 – corporate income tax

Attachment 9 – efficiency benefit sharing scheme

Attachment 10 – capital expenditure sharing scheme

Attachment 11 – service target performance incentive scheme

Attachment 12 – pricing methodology

Attachment 13 – pass through events

Attachment 14 – negotiated services

Contents

Note	7-2
Contents	7-3
Shortened forms	7-5
7 Operating expenditure	7-7
7.1 Final decision	7-7
7.2 TransGrid’s revised proposal	7-7
7.3 Assessment approach	7-8
7.4 Summary of our decision	7-17
7.4.1 Forecasting method	7-20
7.4.2 Base year opex	7-20
7.4.3 Network support	7-22
7.4.4 Step changes	7-22
7.4.5 Rate of change.....	7-25
7.4.6 Inflation	7-27
7.4.7 Debt raising costs.....	7-27
7.4.8 Interrelationships.....	7-27
7.4.9 Assessment of opex factors	7-28
A Forecasting method	7-32
A.1 Position	7-32
A.2 Revised proposal	7-33
A.2.1 Major operating projects	7-35
A.2.2 Insurance and self-insurance	7-37
A.2.3 Defined benefits superannuation obligations	7-38
B Step changes	7-42
B.1 Final position	7-42

B.2	Position in draft decision	7-43
B.3	TransGrid’s revised proposal and submissions	7-43
B.3.1	Assessment approach.....	7-44
B.3.2	Change to Sydney office accommodation	7-48
B.3.3	Payroll efficiencies and Closure of Yass control room step changes7-48	
B.3.4	Revenue reset costs	7-49
B.3.5	Rental fees for communication towers on crown lands.....	7-49
B.3.6	AER's new regulatory guidelines.....	7-50
B.3.7	Transfer of AEMO system operator functions.....	7-52
B.3.8	Consumer engagement.....	7-54
B.3.9	Increase in demand management innovation allowance	7-60
B.3.10	Easement maintenance.....	7-62
B.3.11	Major operating projects capex/opex trade-offs.....	7-65
C	Opex rate of change	7-67
C.1	Assessment approach.....	7-67
C.2	Position.....	7-68
C.3	Draft position	7-70
C.4	Revised proposal and submissions.....	7-70
C.4.1	Our concerns with TransGrid's method of forecasting the rate of change 7-71	
C.4.2	Application of economic benchmarking	7-75
C.4.3	Output growth	7-80
C.4.4	Productivity growth.....	7-84
C.4.5	Step changes	7-87
C.4.6	Price growth	7-89

Shortened forms

Shortened form	Extended form
AARR	aggregate annual revenue requirement
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ASRR	annual service revenue requirement
augex	augmentation expenditure
capex	capital expenditure
CCP	Consumer Challenge Panel
CESS	capital expenditure sharing scheme
CPI	consumer price index
DRP	debt risk premium
EBSS	efficiency benefit sharing scheme
ERP	equity risk premium
MAR	maximum allowed revenue
MRP	market risk premium
NEL	national electricity law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
NSP	network service provider

Shortened form	Extended form
NTSC	negotiated transmission service criteria
opex	operating expenditure
PPI	partial performance indicators
PTRM	post-tax revenue model
RAB	regulatory asset base
RBA	Reserve Bank of Australia
repex	replacement expenditure
RFM	roll forward model
RIN	regulatory information notice
RPP	revenue and pricing principles
SLCAPM	Sharpe-Lintner capital asset pricing model
STPIS	service target performance incentive scheme
TNSP	transmission network service provider
TUoS	transmission use of system
WACC	weighted average cost of capital

7 Operating expenditure

Operating expenditure (opex) refers to the operating, maintenance and other non-capital expenses incurred in the provision of prescribed transmission services. Opex is one of the building blocks we use to determine a service providers' total revenue requirement.

7.1 Final decision

We are not satisfied that TransGrid's forecast opex reasonably reflects the opex criteria.¹ Our alternative estimate of the TransGrid's opex for the 2014–18 period, which we consider reasonably reflects the opex criteria, is in table 7.1.

Table 7.1 Our final decision on total opex (\$ million, 2013–14)

	2014–15	2015–16	2016–17	2017–18	Total
TransGrid's proposal	180.2	188.9	195.4	190.2	754.6
AER draft decision	162.8	161.1	161.2	161.8	647.1
TransGrid's revised proposal	173.1	182.3	185.7	178.7	719.9
AER final decision	167.0	165.8	170.3	163.8	667.0
Difference	-6.1	-16.5	-15.4	-14.9	-52.9

Source: TransGrid, Revised revenue proposal, PTRM; AER analysis.

Note: Excludes debt raising costs and has been expressed in yearend terms.

7.2 TransGrid's revised proposal

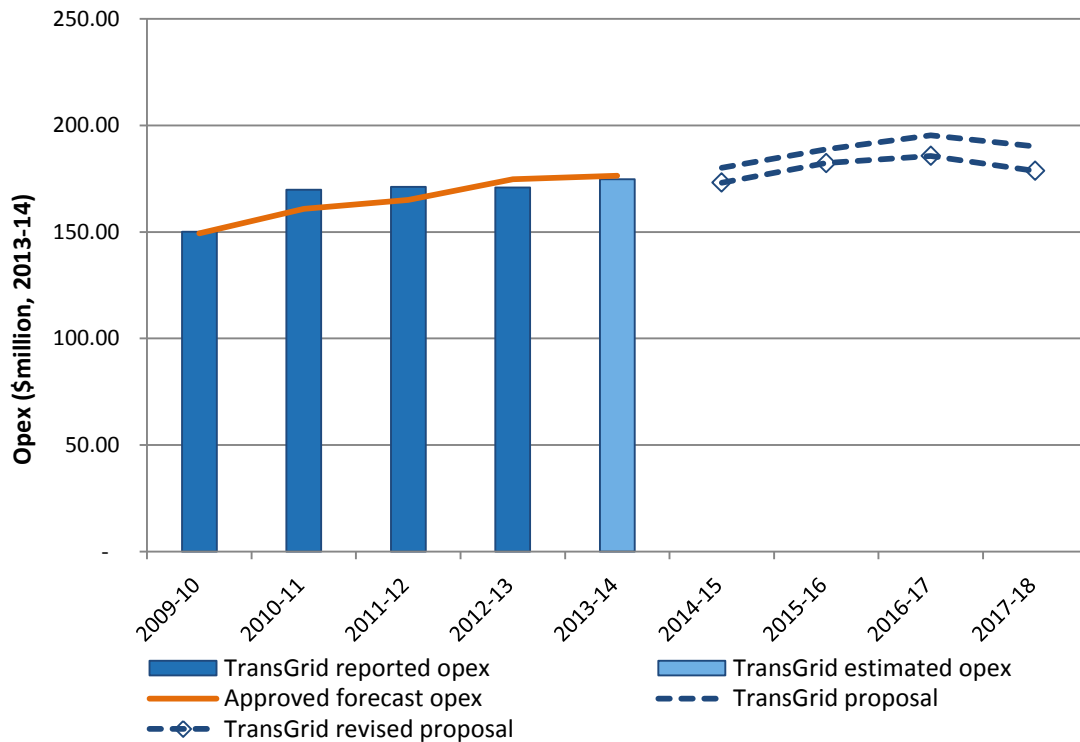
TransGrid proposed a forecast opex of \$719.9 million (\$2013–14) for the 2014–18 period, excluding debt raising costs. The average annual proposed opex is \$25.8 million (or 16.7 per cent) higher than the average annual actual opex over the 2009–14 period.

Figure 7.1 compares TransGrid's forecast opex for the 2014–18 period to its recent historical opex. The increase in TransGrid's proposed opex is mostly due to output growth, and step changes.²

¹ NER, cl. 6A.6.6(c).

² TransGrid, *Opex model*, version 3.00, input version 4.31; AER analysis.

Figure 7.1 TransGrid’s actual/estimated and proposed opex, 2009-10 to 2017-18 (\$ million, 2013–14)



Note: Excludes network support costs, debt raising costs and movements in provisions.

Source: TransGrid, Revenue proposal, May 2014, PTRM; TransGrid, Revised revenue proposal, January 2015, PTRM; AER analysis.

7.3 Assessment approach

Our assessment approach, outlined below, is consistent with our Guideline. We decide whether or not to accept the service provider's total forecast opex. We accept the service provider's forecast if we are satisfied that it reasonably reflects the opex criteria.³ If we are not satisfied, we must replace it with a total forecast opex that we are satisfied does reasonably reflect the opex criteria.⁴

It is important to note that we make our assessment about the total forecast opex and not about particular categories or projects in the opex forecast. The Australian Energy Market Commission (AEMC) has expressed our role in these terms:⁵

It should be noted here that what the AER approves in this context is expenditure allowances, not projects.

³ NER, cll. 6A.6.6(c), 6A.14.1(3).

⁴ NER, cll. 6A.6.6(d), 6A.13.2(b)(3), 6A.14.1(3)(ii).

⁵ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. vii.

The service provider's forecast is intended to cover the expenditure that will be needed to achieve the operating expenditure objectives. These objectives are:⁶

1. Meeting or managing the expected demand for prescribed transmission services over the regulatory control period
2. Complying with all applicable regulatory obligations or requirements associated with providing prescribed transmission services
3. Where there is no regulatory obligation or requirement, maintaining the quality, reliability and security of supply of prescribed transmission services and maintaining the reliability and security of the transmission system.
4. Maintaining the safety of the transmission system through the supply of prescribed transmission services.

We assess the proposed total forecast opex against the opex criteria set out in the NER. The opex criteria provide that the total forecast must reasonably reflect:⁷

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

The AEMC noted that '[t]hese criteria broadly reflect the NEO [National Electricity Objective]'.⁸

In deciding whether or not we are satisfied the service provider's forecast reasonably reflects the opex criteria we must have regard to the opex factors.⁹ We attach different weight to different factors when making our decision to best achieve the National Electricity Objective. This approach has been summarised by the AEMC as follows:¹⁰

As mandatory considerations, the AER has an obligation to take the capex and opex factors into account, but this does not mean that every factor will be relevant to every aspect of every regulatory determination the AER makes. The AER may decide that certain factors are not relevant in certain cases once it has considered them.

The opex factors we have regard to are:

⁶ NER, cl. 6A.6.6(a).

⁷ NER, cl. 6A.6.6(c).

⁸ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 113.

⁹ NER, cll. 6A.6.6(e), 6A.14.1(3)(ii).

¹⁰ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 115.

- the most recent annual benchmarking report that has been published under clause 6A.31 and the benchmark operating expenditure that would be incurred by an efficient Transmission Network Service Provider over the relevant regulatory control period;
- the actual and expected operating expenditure of the Transmission Network Service Provider during any preceding regulatory control periods;
- the extent to which the operating expenditure forecast includes expenditure to address the concerns of electricity consumers as identified by the Transmission Network Service Provider in the course of its engagement with electricity consumers;
- the relative prices of operating and capital inputs;
- the substitution possibilities between operating and capital expenditure;
- whether the operating expenditure forecast is consistent with any incentive scheme or schemes that apply to the Transmission Network Service Provider under clauses 6A.6.5, 6A.7.4 or 6A.7.5;
- the extent the operating expenditure forecast is referable to arrangements with a person other than the Transmission Network Service Provider that, in the opinion of the AER, do not reflect arm's length terms;
- whether the operating expenditure forecast includes an amount relating to a project that should more appropriately be included as a contingent project under clause 6A.8.1(b);
- the most recent NTNDP and any submissions made by AEMO, in accordance with the NER, on the forecast of the Transmission Network Service Provider's required operating expenditure;
- the extent to which the Transmission Network Service Provider has considered and made provision for efficient and prudent non-network alternatives;
- any relevant project assessment conclusions report required under 5.16.4 ; and
- any other factor the AER considers relevant and which the AER has notified the Transmission Network Service Provider in writing, prior to the submission of its revised Revenue Proposal under clause 6A.12.3, is an operating expenditure factor.

For this determination, there is one additional operating expenditure factors that we will take into account under the last opex factor above:

- our benchmarking data sets including, but not necessarily limited to:
 - (a) data contained in any economic benchmarking RIN, category analysis RIN, reset RIN or annual reporting RIN
 - (b) data sets that support other assessment techniques consistent with the approach set out in our Guideline
 as updated from time to time.

For transparency and ease of reference, we have included a summary of how we have had regard to each of the opex factors in our assessment at the end of this Attachment.

More broadly, we also note in exercising our discretion, we take into account the revenue and pricing principles which are set out in the National Electricity Law.¹¹

This Attachment sets out our general approach to assessment. Our approach to assessment of particular aspects of the opex forecast is also set out in more detail in the relevant Appendices.

The Expenditure Forecast Assessment Guideline

After conducting an extensive consultation process with service providers, users, consumers and other interested stakeholders we issued an *Expenditure forecast assessment guideline* (Guideline) in November 2013 together with an explanatory statement.¹² Our Guideline sets out our intended approach to assessing operating expenditure in accordance with the NER.¹³

We may depart from the approach set out in our Guideline but if we do so we give reasons for doing so. In this determination for the most part we have not departed from the approach set out in the Guideline. In our Framework and Approach paper for each service provider, we set out our intention to apply our Guideline approach in making this determination.

Our approach is to compare the service provider's total forecast opex with an alternative estimate that we develop ourselves.¹⁴ By doing this we form a view on whether we are satisfied that the service provider's proposed total forecast opex reasonably reflects the opex criteria. If we conclude the proposal does not reasonably reflect the opex criteria, we use our estimate as a substitute forecast. This approach was expressly endorsed by the AEMC in its decision on the major rule changes that were introduced in November 2012. The AEMC stated:¹⁵

While the AER must form a view as to whether a NSP's proposal is reasonable, this is not a separate exercise from determining an appropriate substitute in the event the AER decides the proposal is not reasonable. For example, benchmarking the NSP against others will provide an indication of both whether the proposal is reasonable and what a substitute should be. Both the consideration of "reasonable" and the determination of the substitute must be in respect of the total for capex and opex.

¹¹ NEL, s. 16(2); s. 7A.

¹² AER, *Expenditure forecasting assessment guideline - explanatory statement*, November 2013

¹³ NER, cl. 6A.5.6.

¹⁴ AER, *Expenditure forecast assessment guideline for Electricity Transmission*, November 2013, p. 7.

¹⁵ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 112.

Our estimate is unlikely to exactly match the service provider's forecast because the service provider may not adopt the same forecasting method. However, if the service provider's inputs and assumptions are reasonable, its method should produce a forecast consistent with our estimate.

If a service provider's total forecast opex is materially different to our estimate and there is no satisfactory explanation for this difference, we may form the view that the service provider's forecast does not reasonably reflect the opex criteria. Conversely, if our estimate demonstrates that the service provider's forecast reasonably reflects the expenditure criteria, we will accept the forecast.¹⁶ Whether or not we accept a service provider's forecast, we will provide the reasons for our decision.¹⁷

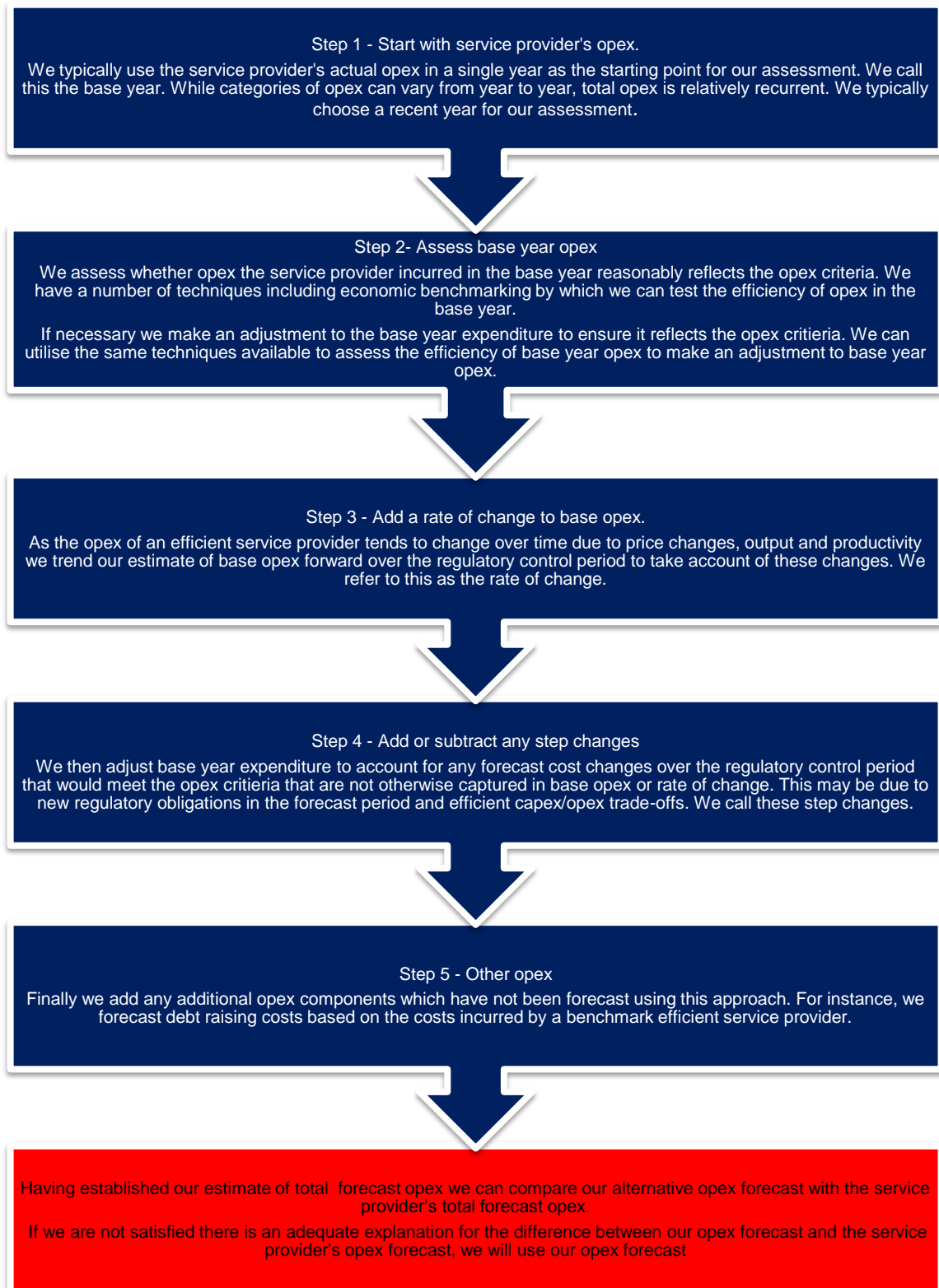
Building an alternative estimate of total forecast opex

Our approach to forming an alternative estimate of opex involves five key steps which we outline below in Figure 7.2.

¹⁶ NER, cl. 6A.6.6(c).

¹⁷ NER, cl. 6A.14.2.

Figure 7.2 Our assessment approach



Underlying our approach are two general assumptions:

1. the efficiency criterion and the prudence criterion in the NER are complementary
2. actual expenditure was sufficient to achieve the opex objectives in the past.

We have used this general approach in our past decisions. It is a well-regarded top-down forecasting model that has been employed by a number of Australian regulators over the last fifteen years. We refer to it as a 'revealed cost method' in our Guideline (and we have sometimes referred to it as the base-step-trend method in our past regulatory decisions).

While these general steps are consistent with our past determinations, we have adopted a significant change in how we give effect to this approach, following the major changes to the NER made in November 2012. Those changes placed significant new emphasis on the use of benchmarking in our opex analysis. We will now issue benchmarking reports annually and have regard to those reports. These benchmarking reports provide us with one of a number of inputs for determining forecast opex.

We have set out more detail about each of the steps we follow in constructing our forecast below.

Step 1—Starting point—base year expenditure

We prefer to use a recent year for which audited figures are available as the starting point for our analysis. We call this the base year. This is for a number of reasons:

- As total opex tends to be relatively recurrent, total opex in a recent year typically best reflects a service provider's current circumstances.
- During the past regulatory control period, we have incentives in place to reward the service provider for making efficiency improvements by allowing it to retain a portion of the efficiency savings it makes. Similarly, we penalise the service provider when it is relatively less efficient. This gives us confidence that the service provider did not spend more in the proposed base year to try to inflate its opex forecast for the next regulatory control period.
- Service providers also face many regulatory obligations in delivering services to consumers. These regulatory obligations ensure that the financial incentives a service provider faces to reduce its costs are balanced by obligations to deliver services safely and reliably. In general, this gives us confidence that recent historical opex will be at least enough to achieve the opex objectives.

In choosing a base year, we need to make a decision as to whether any categories of opex incurred in the base year should be removed. For instance:

- If a category of opex in the base year is not going to be included in prescribed services opex in the 2014–18 period we will remove it.
- Rather than use all opex in the base year, service providers also often forecast specific categories of opex using different methods. We must also assess these methods in deciding what the starting point should be. If we agree that these

categories of opex should be assessed differently, we will also remove them from the base year.

As part of this step we also need to consider any interactions with the incentive scheme for opex, the Efficiency Benefit Sharing Scheme (EBSS). The EBSS is designed to achieve a fair sharing of efficiency gains and losses between a service provider and its consumers. Under the EBSS, service providers receive a financial reward for reducing their costs in the regulatory control period and a financial penalty for increasing their costs. The benefits of a reduction in opex flow through to consumers as long as base year opex is no higher than the opex incurred in that year. Similarly, the costs of an increase in opex flow through to consumers if base year opex is no lower than the opex incurred in that year. If the starting point is not consistent with the EBSS, service providers could be excessively rewarded for efficiency gains or excessively penalised for efficiency losses in the prior regulatory control period.

Step 2—Assessing base year expenditure

Regardless of the base year we choose, the service provider's actual expenditure may not reflect the opex criteria. For example, it may not be efficient or management may not have acted prudently in its governance and decision-making processes. We must test whether actual expenditure in that year should be used to forecast efficient opex in the next regulatory control period.

As we set out in our Guideline, to assess the efficiency of a service provider's actual expenditure, we use a number of different techniques.¹⁸

Benchmarking is particularly important in comparing the relative efficiency of different service providers. The AEMC highlighted the importance of benchmarking in its changes to the NER in November 2012:¹⁹

‘The Commission views benchmarking as an important exercise in assessing the efficiency of a NSP and informing the determination of the appropriate capex or opex allowance.’

By benchmarking a service provider's expenditure we can compare its productivity over time, and to other service providers. For this decision we have used Multilateral Total Factor Productivity modelling, and partial productivity indicators.

We have also had regard to trends in total level opex and used historical data to construct partial performance indicators to inform our assessment of the efficiency of the base year expenditure.

If we determine that a service provider's base year expenditure does not reasonably reflect the opex criteria, we will not use it as our starting point for our estimate of total

¹⁸ AER, *Expenditure forecast assessment guideline*, November 2013, p. 22.

¹⁹ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 97.

forecast opex. Rather, we will adjust it so it reflects an efficient, recurrent level of opex that does reflect the opex criteria. To arrive at an adjustment, we use the same techniques we used to assess the service provider's efficiency.

Step 3—Rate of change

Once we have chosen a starting point that reflects the opex criteria, we apply an annual escalator to take account of the likely ongoing changes to opex over the forecast regulatory control period. Opex that reflects the opex criteria in the forecast regulatory control period could reasonably differ from the starting point due to:

- price growth
- output growth
- productivity growth.

We estimate the change by adding forecast growth in prices (such as the price of labour and materials) and outputs (such as changes in customer numbers and demand for electricity). We then incorporate reasonable estimates of productivity growth.

Step 4—Step changes

We then consider if there is other opex needed to achieve the opex objectives in the forecast period. We refer to these as 'step changes'. Step changes may be for cost drivers such as new, changed or removed regulatory obligations, or efficient capex/opex trade-offs. As our Guideline explains, we will typically only include step changes if efficient base year opex and the rate of change in opex of an efficient service provider do not already compensate for the proposed costs.²⁰

Step 5—Other costs that are not included in the base year

In our final step, we make any further adjustments we need for our opex forecast to achieve the opex objectives. For instance, our approach is to forecast debt raising costs based on a benchmarking approach rather than a service provider's actual costs. This is to be consistent with the forecast of the cost of debt in the rate of return building block.

After applying these five steps, we arrive at our total opex forecast.

Comparing the service provider's proposal with our estimate

Having established our estimate of total forecast opex we can test the service provider's proposed total forecast opex. This includes comparing our alternative total with the service provider's total forecast opex. However, we also assess whether the service provider's forecasting method, assumptions, inputs and models are

²⁰ AER, *Expenditure forecast assessment guideline*, November 2013, p. 24.

reasonable, and assess the service provider's explanation of how that method results in a prudent and efficient forecast.

The service provider may be able to adequately explain any differences between its forecast and our estimate. We can only determine this on a case by case basis using our judgment.

This approach is supported by the AEMC's decision when implementing the changes to the NER in November 2012. The Commission stated:²¹

... the AER could be expected to approach the assessment of a NSP's expenditure (capex or opex) forecast by determining its own forecast of expenditure based on the material before it. Presumably this will never match exactly the amount proposed by the NSP. However there will be a certain margin of difference between the AER's forecast and that of the NSP within which the AER could say that the NSP's forecast is reasonable. What the margin is in a particular case, and therefore what the AER will accept as reasonable, is a matter for the AER exercising its regulatory judgment.

If we are not satisfied there is an adequate explanation for the difference between our opex forecast and the service provider's opex forecast, we will use our opex forecast in determining a service provider's total revenue requirement.

As outlined in our Guideline, if the prudent and efficient opex allowance to achieve the opex objectives is lower than a service provider's current opex, we would expect a prudent operator would take the necessary action to improve its efficiency and prudence. We would expect a service provider (including its shareholders) to bear the cost of any inefficiency or imprudent actions. To do otherwise, would mean electricity network consumers would fund some costs of a service provider's inefficiency or imprudent actions.

Accordingly, if our opex forecast is lower than a service provider's current opex we would generally not consider it appropriate to provide a transition path to the efficient allowance. This approach is reflected in the NER, which provides that we must be satisfied that the opex forecast reasonably reflects the efficient costs of a prudent operator given reasonable expectations of the demand forecast and cost inputs to achieve the expenditure objectives.²²

7.4 Summary of our decision

We are not satisfied that TransGrid's total opex forecast reasonably reflects the opex criteria. We reached this conclusion after assessing TransGrid's revised revenue proposal using the approach set out in our Guideline. TransGrid's total opex forecast is

²¹ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 112.

²² AER, *Expenditure forecast assessment guideline - Explanatory statement*, November 2013, p. 23.

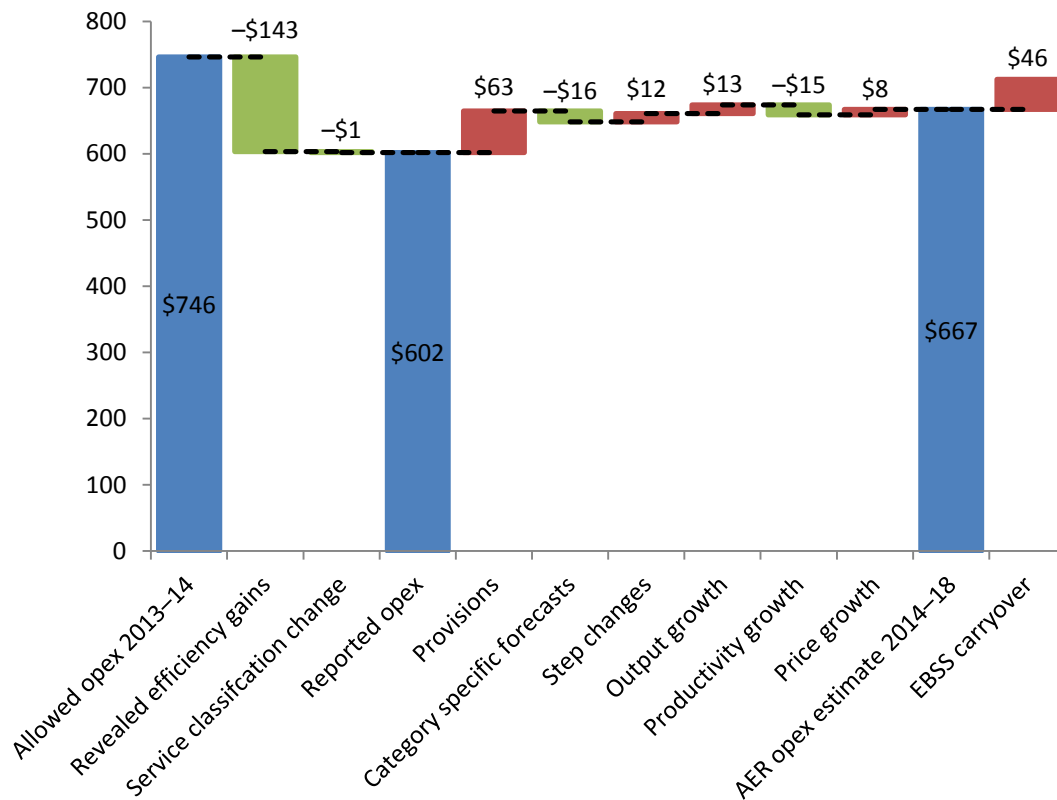
materially higher than our estimate of the efficient opex a prudent operator would require to achieve the opex objectives. We are not satisfied TransGrid's total opex forecast reasonably reflects the opex criteria. For this reason, we have substituted TransGrid's total opex forecast with our alternative total opex forecast.

In our alternative total opex forecast we did not adopt the following aspects of TransGrid's proposed forecast total opex:

1. **Forecasting method:** TransGrid developed its forecast using a hybrid 'base-step-trend' approach, which included 'bottom-up' or 'zero-based' forecasts of certain categories. The difference in forecasting method accounts for \$14.9 million (\$2013–14) of the difference between TransGrid's proposed opex and our estimate.
2. **Rate of change:** TransGrid's revised proposal forecast output growth as a function of forecast capex. It forecast productivity growth based on assumed economies of scale factors applied to forecast output growth. TransGrid adopted our approach to forecasting price growth. The difference in the forecast rate of change accounts for \$21.9 million (\$2013–14) of the difference between our substitute estimate and TransGrid's proposal. Of this, \$19.8 million (\$2013–14) is attributable to output growth and productivity growth.
3. **Step changes:** We have included four of the ten step changes proposed by TransGrid in its revised proposal. This amounts to \$0.1 million (\$2013–14) of step changes over the 2014–18 period compared to the \$23.4 million (\$2013–14) proposed by TransGrid (not including the two negative step changes we have assessed as productivity growth). We have also included a step change of \$12.4 million (\$2013–14) for three of TransGrid's major operating projects (MOPs) in TransGrid's revised proposal, which deliver capex/opex trade-offs.

Figure 7.3 illustrates how we constructed our forecast. The starting point on the left is what TransGrid's opex for the 2014–18 period would be if we set annual opex equal to TransGrid's opex allowance for 2013–14.

Figure 7.3 AER final decision opex forecast



Source: AER analysis

We outline the key elements of our alternative opex forecast and areas of difference between our estimate of opex and TransGrid's estimate below:

- Section 7.4.1 and Appendix A sets out why we consider TransGrid's forecasting method does not produce an opex forecast consistent with opex criteria and why we have used our guideline method to forecast our alternative estimate.
- Section 7.4.2 sets out why we have used 2012-13 opex as the basis for forecasting opex for the 2014-18 period.
- Section 7.4.3 sets out why we are satisfied with TransGrid's revised forecast of network support expenditure.
- Section 7.4.4 and Appendix B, outlines our assessment of TransGrid's proposed step changes.
- Section 7.4.5 and Appendix C outlines our assessment of the rate of change used to forecast opex in the 2018-18 period. This includes a discussion of the three elements comprising the rate of change—price, output and productivity growth.
- Section 7.4.6 outlines how we have treated inflation.
- Section 7.4.7 outlines our assessment of the proposed cost of debt.

7.4.1 Forecasting method

Our estimate of total opex is unlikely to exactly match TransGrid's forecast (see our assessment approach). Broadly, differences between the two forecasts can be explained by differences in the forecasting methods adopted and the inputs and assumptions used to apply the method. We have reviewed TransGrid's forecasting method to identify if and where TransGrid's forecasting method departed from our guideline forecasting method. Where TransGrid's forecasting method did depart from our guideline forecasting method we considered whether this departure explained the difference between TransGrid's forecast of total opex and our own. We also considered whether adopting TransGrid's approach was required to produce an opex forecast that reasonably reflects the opex criteria, having regard to the opex factors.

TransGrid's opex forecasting method explains \$14.9 million (\$2013–14) of the difference between TransGrid's opex forecast and our estimate. TransGrid's use of category specific forecasts to forecast expenditure for major operating projects (MOPs) is the main driver of this difference.

We are not satisfied that category specific forecasts of MOPs and insurance expenditure are required to produce a forecast of total opex that meets the opex criteria. We have not included category specific forecasts for MOPs and insurance expenditure in our alternative estimate of total opex. We have, however, included a step change for three of the proposed MOPs projects because they are capex/opex trade-offs (see our assessment of step changes in Appendix B).

7.4.2 Base year opex

To form our alternative opex forecast we have used a forecast based on TransGrid's actual opex in 2012–13.²³ As outlined in our draft decision, we have no evidence to suggest that TransGrid's revealed base year expenditure is materially inefficient.²⁴ In arriving at this conclusion we had regard to the results of various benchmarking analyses. We considered that, on the whole, our benchmarking analysis for TransGrid was inconclusive. We used the following assessment techniques to assess whether TransGrid's base year expenditure was consistent with the opex criteria:

- multilateral total factor productivity (MTFP) / MPFP
- partial performance indicators (PPIs) / category analysis.

However, we received submissions that we should be applying economic benchmarking to assess the efficiency of the transmission service providers' base year

²³ We have removed network support costs and defined benefits superannuation from TransGrid's actual opex in forming our base opex forecast. This is consistent with TransGrid's approach

²⁴ AER, *Draft decision: TransGrid transmission determination 2015–16 to 2017–18*, Attachment 7, November 2014, pp. 33–35.

opex.²⁵ In particular, the CCP considers that we did not justify our decision not to apply benchmarking.²⁶

We explained in the transmission benchmarking report that the relative rankings of the service providers observed were sensitive to the model specification.²⁷ Further, there are only a few transmission services providers within Australia which makes efficiency comparisons difficult.

At this stage, we are not confident that the MTFP model specification and results are sufficiently robust to assess the efficiency of the transmission service providers' base opex. Economic Insights explained that benchmarking of transmission services is in its relative infancy and caution against drawing strong inferences about transmission service provider efficiency levels from the MTFP results.²⁸ However, for the reasons we discuss in Appendix C, we are confident our benchmarking work is sufficiently robust to forecast the rate of change. The issues regarding the use of MTFP to assess the relative efficiency of transmission network service providers are not relevant to forecasting the rate of change.

The CCP considered there was evidence of inefficiency in TransGrid's base opex, as indicated by the partial performance indicators (PPIs) that we presented in the 2014 annual transmission benchmarking report.²⁹ As we found in our 2012 joint ACCC/AER review of benchmarking techniques, we consider that PPIs are useful as a cross-check for economic benchmarking results, but should not be used in isolation as a definitive assessment of the efficiency of a service provider's opex.³⁰ We therefore do not rely on PPIs to draw conclusions about the efficiency of TransGrid's opex.

The CCP also noted that the service providers have provided a broad range of benchmarking reports in support of their proposals, and we could use this information in our decisions.³¹ We consider we cannot place reliance on these benchmarking analyses to make deterministic adjustments to base year expenditure. Though informative, these benchmarking analyses do not measure cost efficiency (which requires the consideration of the use of inputs to deliver all outputs).

²⁵ Consumer Challenge Panel, Consumer challenge panel submission – AER draft TransGrid determination and TransGrid revised revenue proposal, February 2015, p. 31; Energy Markets Reform Forum, Submission to AER draft decision and TransGrid revised proposal, January 2015, pp. 33–34

²⁶ Consumer Challenge Panel, Consumer challenge panel submission – AER draft TransGrid determination and TransGrid revised revenue proposal, February 2015, p. 35.

²⁷ AER, Electricity transmission network service providers annual benchmarking report, November 2014, p. 6.

²⁸ Economic Insights Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs, 10 November 2014, p. 2.

²⁹ Consumer Challenge Panel, Consumer challenge panel submission – AER draft TransGrid determination and TransGrid revised revenue proposal, February 2015, p. 33; AER, Electricity transmission network service providers annual benchmarking report, November 2014, pp. 17–21, 26–37.

³⁰ ACCC/AER, *Benchmarking opex and capex in energy networks*, Working paper no. 6, May 2012, p. 35.

³¹ Consumer Challenge Panel, Consumer challenge panel submission – AER draft TransGrid determination and TransGrid revised revenue proposal, February 2015, pp. 32–34.

7.4.3 Network support

TransGrid did not include any network support costs in its revised revenue proposal.³² This is consistent with our draft decision.³³

Because TransGrid adopted our draft decision on network support costs, and because submissions have not raised any issues which impact upon our reasoning as set out in the draft decision, we are satisfied that TransGrid's total opex forecast should not include network support costs.

TransGrid included network support costs in its initial revenue proposal as part of the Powering Sydney's Future project it included. TransGrid proposed pre-emptive network support to build up the market for network support in advance of requiring network support.³⁴ However, it removed the forecast network support costs from its revised revenue proposal due its proposed deferral of the Powering Sydney's Future project as a result of revised connection point demand forecasts.³⁵

7.4.4 Step changes

In some instances, a service provider may face a step change in efficient costs that are not reflected in the base year or rate of change for the regulatory control period. We assess step changes in the context of our assessment of the total opex forecast in the service provider's proposal. When we assess the step changes proposed by a service provider, we consider whether they are required for the total opex forecast to meet the opex criteria.

As a starting point, we consider whether the proposed step changes in opex are already compensated through other elements of our opex forecast, such as the base efficient opex or the 'rate of change' component. Step changes should not double count costs included in other elements of the opex forecast.

We then assess the reasons for, and the efficient level of, the incremental costs (relative to that funded by base opex and the rate of change) that the service provider has proposed.

One important consideration is whether each proposed step change is driven by an external obligation (such as new legislation or regulations) or an internal management decision (such as a decision to increase maintenance opex). Step changes should generally relate to a new obligation or some change in the service provider's operating environment beyond its control. It is not enough to simply demonstrate that the costs of

³² TransGrid, *Revised revenue proposal*, January 2015, pp. 76–77.

³³ AER, *Draft decision: TransGrid transmission determination 2015–16 to 2017–18*, Attachment 7, November 2014, pp. 35–37.

³⁴ TransGrid, *Revised revenue proposal*, January 2015, p. 78.

³⁵ TransGrid, *Revised revenue proposal*, January 2015, p. 76.

an activity that was not previously undertaken are efficient. Our opex forecasting approach may already capture these costs elsewhere.

We have not included in our alternative estimate of total opex all of the step changes TransGrid proposed. For some of the proposed step changes there is no change in regulatory obligations and we consider that the cost variations are best dealt with by allowing the EBSS to operate. In other instances, TransGrid failed to provide a business case or demonstrate that there is a net positive value resulting from the expenditure, thereby failing to show that the expenditure is prudent and efficient and in the long term interests of consumers.

We have included five step changes in our alternative opex forecast. They are for reduced office accommodation costs, revenue reset costs, complying with new regulatory guidelines, the transfer of AEMO system operator functions to TransGrid and major operating projects (MOPs) capex/opex trade-offs. We are not satisfied adding step changes for other cost drivers identified by TransGrid would lead to a forecast of opex that reasonably reflects the opex criteria.

We have adopted the same assessment approach to step changes in this final decision as we did on our draft decision, with one exception. We have changed our position that changes in TransGrid's regulatory obligations are already accounted for in our estimate of the rate of change.

In our draft decision we stated that an increased regulatory burden would reduce productivity growth. The historical productivity rate is what service providers were able to achieve while meeting new regulatory requirements introduced at the time.³⁶ Consequently, using the measured historical productivity growth rate to estimate the future productivity growth rate will compensate service providers for an increased regulatory burden through the forecast productivity growth. Service providers would only require additional compensation when they face greater increases in regulatory obligations than in the past.³⁷

We calculated our forecast of productivity growth rate using the historical average transmission industry productivity, which includes step change expenditure for changing regulatory obligations. However, we do not have data on what service providers actually spent on new or changed regulatory obligations in the previous period. Because we cannot accurately determine how much the productivity growth component of the rate of change will compensate services providers for regulatory change, we have reconsidered our position. Where a service provider can demonstrate that its proposed forecast includes efficient costs due to a changed regulatory obligation we will consider whether the forecast of productivity growth accounts for those costs on a case by case basis. For this final decision we have assumed that our forecast of productivity growth compensates for none of the additional costs.

³⁶ AER, *Explanatory statement: Expenditure assessment forecast guideline*, November 2013, pp. 52–54, 69 and 72.

³⁷ AER, *Draft decision: TransGrid transmission determination 2015–16 to 2017–18*, Attachment 7, November 2014, pp.65–66.

This change in approach has impacted our assessment of three of TransGrid's proposed step changes. These step changes are for revenue reset costs, the cost of complying with new regulatory guidelines and the transfer of AEMO system operator functions to TransGrid.

TransGrid also noted that its MOPs forecast included specific trade-offs between capex and opex that it considered were not present in its historical costs. Therefore, TransGrid considered we should include three of its major operating projects as capex/opex trade-offs in our alternative forecast.³⁸ We are satisfied that these three projects represent a prudent and efficient capex/opex trade-off.

For more detailed discussion of our decision, see Appendix A.

Table 7.2 AER's assessment of TransGrid's proposed step changes (\$ million, 2013–14)

	Proposal	Draft position	Revised proposal	Final Position	Reasons
Change to Sydney office accommodation	-6.4	-6.4	-6.4	-6.4	We consider this is a prudent and efficient capex/opex trade-off.
Payroll efficiencies	-2.6	0	-2.6	0	We consider this step change in our assessment of TransGrid's forecast change in productivity.
Closure of Yass control room	-0.3	0	-0.3	0	We consider this step change in our assessment of TransGrid's forecast change in productivity.
Revenue reset	1.4	0	1.4	0.3	We consider that most of this represents a normal variation in business expenditure which is best dealt with through the operation of the EBSS. However, we are satisfied part of the step change is a prudent and efficient cost to meet a new regulatory obligation.
Rental fees for towers on crown lands	0.5	0	0.5	0	We consider that the increase in rental fees is a price increase. This price increase is compensated through the rate of change increment of the opex forecast.
AER's new regulatory guidelines	2.4	0	2.4	2.4	We are satisfied this is a prudent and efficient cost to meet a new regulatory obligation.
Transfer of AEMO system operator functions	3.7	0	3.7	3.7	We are satisfied this is a prudent and efficient cost to meet a new regulatory obligation.
Consumer engagement	8.8	0	6.6	0	We consider that the proposed expenditure represents business as usual processes

³⁸ TransGrid, *Revised revenue proposal*, January 2015, p.104.

	Proposal	Draft position	Revised proposal	Final Position	Reasons
					rather than new regulatory obligations.
Demand management innovation	10.2	0	10.4	0	Given the change in peak demand forecasts and our approved NCIPAP and network support expenditure, we do not consider that a step change in addition to the \$1 million per year allowance approved in the last reset, now included in the base year, is required.
Easement maintenance	6.4	0	4.7	0	We consider that this represents a normal variation in business expenditure which is best dealt with through the operation of the EBSS. We do not consider there is a change in regulatory obligations such that total opex would materially alter.
MOPs capex/opex trade-offs	0	0	0*	12.4	We considered this was a prudent and efficient capex/opex trade-off.
Total	24.0	-6.4	20.3	12.5	

Source: TransGrid, Response to AER TransGrid Opex 03 and 04

Note: Totals may not reconcile due to rounding.

* TransGrid did not include a step change for MOPs projects in its revised proposal. Its revised proposal included a bottom-up forecast of MOPs expenditure. However, it considered we should include three MOPs projects as capex/opex trade-offs in our alternative forecast.

7.4.5 Rate of change

The efficient level of expenditure required by the services providers in the 2014–18 period may differ from that required in the final year of the 2009–14 regulatory control period. Once we determined the efficient opex required in the final year of the of the 2009–14 regulatory control period we apply a forecast annual rate of change to forecast opex for the 2014–18 period. The annual rate of change is forecast as:

$$\Delta Opex = \Delta input\ price + \Delta output - \Delta productivity$$

Where Δ denotes the proportional change in a variable.

The rate of change captures the year on year change in efficient expenditure. Specifically it accounts for forecast growth in output levels, prices and productivity (such as economies of scale). These three opex drivers should explain all changes in efficient opex. The output and productivity growth variables capture the forecast change in the quantity of inputs required. The real price growth variable captures the forecast change in the prices of those inputs.

We assessed TransGrid's proposed price, output and productivity growth as an overall rate of change figure.

The difference between TransGrid's proposed overall rate of change and our forecast rate of change is due to different inputs and assumptions applied to all three components of the rate of change. The difference in rate of change accounts for

\$21.9 million (\$2013–14) of the difference between TransGrid's proposed opex and our estimate.³⁹

The difference in our rate of change forecasts is driven by:

- TransGrid's higher forecast output growth which it calculated as a function of its forecast capex. We based our output growth forecast on TransGrid's forecast growth in the outputs we used in our MTFP analysis. Our position on forecast output growth reduces TransGrid's opex forecast by \$27.4 million (\$2013–14).
- We based our forecast of productivity growth on the rate of change of historical electricity transmission industry productivity. This assumes the electricity transmission industry's use of inputs to produce outputs in the previous eight years is an appropriate basis for forecasting of the productivity growth it can achieve in the forecast period. This productivity measure includes all relevant sources of productivity such as economies of scale and technical change. TransGrid's forecast productivity growth is a bottom up build of negative step changes and its economies of scale applied to output growth. Our position on forecast output growth increases TransGrid's opex forecast by \$7.5 million (\$2013–14).
- For price growth, TransGrid adopted our labour price growth method. We have also updated our price growth forecast to reflect the most recent labour price forecasts from Deloitte Access Economics (DAE) and BIS Shrapnel. Our position on forecast price growth reduces TransGrid's opex forecast by \$2.0 million (\$2013–14).

Table 7.3 Forecast rate of change (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid				
Price growth	0.52	0.83	0.92	1.17
Output growth	3.33	2.25	1.18	0.23
Productivity growth ⁴⁰	2.39	2.30	0.45	0.12
Overall rate of change	1.38	0.73	1.66	1.28
AER				
Price growth	0.43	0.39	0.57	0.78

³⁹ In our draft decision we stated the difference in rate of change accounts for \$11.6 million (real 2013–14) of the difference between TransGrid's proposed opex and our estimate. We note that for this final decision we have calculated this amount differently. For the draft decision we included TransGrid's proposed negative step changes for payroll efficiencies and the closure of the Yass control room in TransGrid's forecast productivity growth. For this final decision we have included them in step changes.

⁴⁰ An increase in productivity results in a decrease in opex and the opex rate of change. We note that TransGrid has included an opex/capex trade-off step change for its Sydney accommodation in its productivity forecast. We have assessed this in our step change assessment and we have not included this as a part of forecast productivity.

	2014–15	2015–16	2016–17	2017–18
Output growth	1.31	0.45	0.20	0.52
Productivity growth	0.86	0.86	0.86	0.86
Overall rate of change	0.88	-0.02	-0.10	0.43
Difference	-0.51	-0.76	-1.76	-0.85

Source: AER analysis

Our in depth assessment of TransGrid's rate of change and the methodology we used to forecast our rate of change is in Appendix B.

7.4.6 Inflation

For our draft decision, we used the inflation index lagged by 15 months to convert nominal opex amounts to real 2013–14 dollar terms. This was consistent with the inflation used in the roll forward model. TransGrid stated in its revised revenue proposal that there was no reason to lag the inflation index when converting nominal dollars to real dollars. It based this on advice from HoustonKemp.⁴¹ We have reviewed the advice from HoustonKemp, and conducted further analysis of our own, and we agree that there is no need to lag the inflation index for opex forecasting purposes. Consequently we amended our opex model to apply the inflation index without a 15 month lag, consistent with TransGrid's revised revenue proposal.

7.4.7 Debt raising costs

Debt raising costs are transaction costs incurred each time debt is raised or refinanced. We forecast them using our standard forecasting approach for this category which sets the forecast equal to the costs incurred by a benchmark firm. Our assessment approach and the reasons for those forecasts are set out in the debt and equity raising costs Appendix of Attachment 3 (Rate of Return).

7.4.8 Interrelationships

In assessing TransGrid's total forecast opex we took into account other components of its revenue proposal, including:

- the operation of the EBSS in the 2009–14 regulatory control period in our assessment of TransGrid's forecasting method (see Appendix A)
- the operation of the EBSS in the 2009–14 regulatory control period in our choice of 2012–13 as the base year used to develop our alternative estimate of total opex (see section 7.4.2)

⁴¹ TransGrid, *Revised revenue proposal*, January 2015, p. 107.

- the operation of the EBSS in the 2009–14 regulatory control period, which provided TransGrid an incentive to reduce opex in 2012–13 (see section 7.4.2)⁴²
- the trade-off between potential capex and opex solutions in our assessment of step changes, in particular the inclusion of a step change for changes to TransGrid's Sydney accommodation (see Appendix B)
- the impact of forecast capex on forecast output growth in the rate of change that we applied to the efficient base opex to develop our alternative estimate of total opex (see Appendix C).

7.4.9 Assessment of opex factors

In deciding whether we are satisfied the service provider's forecast reasonably reflects the opex criteria we have regard to the opex factors.⁴³ Table 7.4 summarises how we have taken the opex factors into account in making our draft decision.

Table 7.4 AER consideration of opex factors

Opex factor*	AER's consideration
<p>The most recent annual benchmarking report we have published under clause 6A.31 and the benchmark operating expenditure that would be incurred by an efficient service provider over the relevant regulatory control period</p>	<p>There are two elements to this factor. First, we must have regard to the most recent annual benchmarking report. Second, we must have regard to the benchmark operating expenditure that would be incurred by an efficient transmission network service provider over the period. The annual benchmarking report is intended to provide an annual snapshot of the relative efficiency of each service provider.</p> <p>The second element, that is, the benchmark operating expenditure that would be incurred an efficient provider during the forecast period, necessarily provides a different focus. This is because this second element requires us to construct the benchmark opex that would be incurred by a hypothetically efficient provider for that particular network over the relevant period.</p> <p>We have used several assessment techniques that enable us to estimate the benchmark opex that an efficient service provider would require over the forecast period. These techniques include the multilateral total factor productivity modelling and partial productivity indicators included in our annual benchmarking report.⁴⁴ This report was published with the release of our TransGrid draft decision.</p> <p>In building up our total opex forecast estimate we also applied the results from the opex partial factor productivity modelling for estimating the opex rate of change.</p>
<p>The actual and expected opex of the service provider during any preceding regulatory control periods</p>	<p>Our revealed cost approach is based on an assessment of actual opex in the preceding regulatory control period.</p>

⁴² NER clause 6A.6.6(e)(8)

⁴³ The opex factors are set out in NER clause 6A.6.6(e).

⁴⁴ AER, *Electricity transmission network service providers annual benchmarking report*, November 2014.

Opex factor*	AER's consideration
<p>The extent to which the operating expenditure forecast includes expenditure to address concerns of electricity consumers as identified by the service provider in the course of its engagement with electricity consumers</p>	<p>This works in conjunction with the EBSS that applied in the previous regulatory control period, providing for a comparison of actual and expected costs. The STPIS encourages the service provider to achieve the opex objectives with their actual expenditure in the past regulatory control period. Together, we therefore derived likely future costs that will be needed to meet the opex objectives from past actual and expected opex in the preceding regulatory control period.</p> <p>In assessing the efficiency of the base year expenditure we also had regard to trends in total level opex. We used historical data collected in the economic benchmarking and category analysis RINs to construct category analysis benchmarks. We used this information to inform our assessment of the efficiency of the base year expenditure.</p> <p>We understand the intention of this particular factor is to require us to have regard to the extent to which service providers have engaged with consumers in preparing their revenue proposals, such that they factor in the needs of consumers.⁴⁵</p> <p>We examined the service provider's engagement with consumers and made assessments about the extent to which concerns identified by consumers are reflected in the opex forecast. We also had regard to the views of the CCP and submissions from other consumer groups in assessing TransGrid's opex proposal.</p>
<p>The relative prices of operating and capital inputs</p>	<p>We considered the relative prices of operating and capital inputs in assessing the opex and capex trade-offs as a part of our step change assessment. The relative price of operating and capital inputs was a consideration in our assessment of TransGrid's step changes relating to its Sydney office accommodation and network support opex.</p> <p>The relative prices of operating and capital inputs are included in our multilateral total factor productivity modelling, which uses relative prices to calculate the reasonable level of operating and capital inputs required by an efficient firm.</p>
<p>The substitution possibilities between operating and capital expenditure</p>	<p>Our multilateral total factor productivity modelling can provide an indication of efficiency. We considered whether there are more efficient and prudent trade-offs in investing more or less in capital in place of ongoing operations.</p> <p>We had regard to capex opex trade-offs in relation to a negative step change 'Change to Sydney office accommodation (Accommodation strategy)' and network support opex.</p>
<p>Whether the operating expenditure forecast is consistent with any EBSS, STPIS or small-scale incentive scheme that applies to the service provider</p>	<p>The consistent operation of incentive schemes with our preferred revealed costs forecasting method is a cornerstone of our approach to forecasting an alternative opex. In addition, we take incentive schemes into account in choosing the base year to use for our alternative forecast of opex.</p>

⁴⁵ AEMC, *Rule Determination*, 29 November 2012, pp. 101, 115.

Opex factor*	AER's consideration
The extent the operating expenditure forecast is referable to arrangements with a person other than the service provider that, in the opinion of the AER, do not reflect arm's length terms	If we identify costs incurred to related party businesses, we examine whether this adversely affects the service provider's opex forecast. We did not identify any related party matters which would influence TransGrid's opex forecast.
Whether the operating expenditure forecast includes an amount relating to a project that should more appropriately be included as a contingent project under clause 6A.8.1(b)	We considered whether any projects would more appropriately be included as a contingent project. We have not included TransGrid's network support allowance in our total opex forecast. It was linked to TransGrid's proposed contingent project 'Powering Sydney's Future' which the AER has rejected.
The most recent NTNDP and any submissions made by AEMO, in accordance with the NER, on the forecast of the Transmission Network Service Provider's required operating expenditure.	We examined these factors and took them into account in considering whether the proposed total forecast opex reasonably reflects the opex criteria. We considered AEMO's NTNDP in making our decision in relation to TransGrid's proposed network support allowance. We also considered AEMO's NEFR forecasts in considering TransGrid's proposed DMIA step change.
The extent to which the service provider has considered and made provision for efficient and prudent non-network alternatives	We identified any non-network alternatives to ensure that they are properly reflected in the total forecast opex. We considered non-network alternatives in assessing TransGrid's network support allowance and its DMIA step change.
Any relevant project assessment conclusions report required under 5.16.4.	We identified any RIT-T project that has been submitted by the TransGrid and ensured that the conclusions were appropriately addressed in the total forecast opex. We are unaware of any RIT-T project being submitted by TransGrid.
Any other factor the AER considers relevant and which the AER has notified the service provider in writing, prior to the submission of its revised Revenue Proposal under 6A.12.3, is an operating expenditure factor.	We have used our benchmarking data sets including, but not necessarily limited to data contained in any economic benchmarking RIN, category analysis RIN, reset RIN or annual reporting RIN.

Source: AER analysis.

* The opex factors are set out in NER cl. 6A.6.6(e).

The NER require that we notify the service provider in writing of any other factor we identify as relevant to our assessment, prior to the service provider submitting its revised revenue proposal.⁴⁶ We identified the factors in table 7.5 our draft decision.⁴⁷

⁴⁶ NER, cl. 6A.6.6(e)(14).

⁴⁷ AER, *Draft decision: TransGrid transmission determination 2015–16 to 2017–18*, Attachment 7, November 2014, p. 44.

Table 7.5 Other factor we have had regard to

Opex factor	Consideration
<p>Our benchmarking data sets, including, but not necessarily limited to:</p> <ol style="list-style-type: none"> 1. data contained in any economic benchmarking RIN, category analysis RIN, reset RIN or annual reporting RIN 2. data sets that support other assessment techniques consistent with the approach set out in our Guideline as updated from time to time. 	<p>This information may potentially fall within opex factor (4). However, for absolute clarity, we are using data we gather from NEM service providers to provide insight into the benchmark operating expenditure that would be incurred by an efficient and prudent transmission network service provider over the relevant regulatory period.</p>

A Forecasting method

This Appendix sets out our consideration of TransGrid's forecasting methodology in determining our opex forecast for TransGrid for the 2014–18 period.

Our estimate of total opex is unlikely to exactly match TransGrid's forecast (see our assessment approach at the beginning of this Attachment). Broadly, differences between the two forecasts can be explained by differences in the forecasting methods adopted and the inputs and assumptions used to apply the method. We have reviewed TransGrid's forecasting method to identify if and where TransGrid's forecasting method departed from our guideline forecasting method. Where TransGrid's forecasting method did depart from our guideline forecasting method we considered whether this departure explained the difference between TransGrid's forecast of total opex and our own. We also considered whether adopting TransGrid's approach was required to produce an opex forecast that reasonably reflects the opex criteria, having regard to the opex factors.

Under our guideline forecasting method we start with the actual expenditure in a base year. If actual expenditure in the base year reasonably reflects the opex criteria we set base opex equal to actual expenditure. If not we apply an efficiency adjustment to ensure base opex reflects the opex criteria. We then apply a forecast rate of change to capture forecast changes in prices, output and productivity. We then add or subtract any step changes to account for any other expenditure that reflects the opex criteria and is not captured in base opex or the rate of change.⁴⁸

A.1 Position

TransGrid's opex forecasting method explains \$14.9 million (\$2013–14) of the difference between TransGrid's opex forecast and our estimate. TransGrid's use of category specific forecasts to forecast expenditure for major operating projects (MOPs) and insurance drives this difference.

We have used the same forecasting method to derive our alternative estimate of opex as we used for our draft decision.

Following review of TransGrid's revised proposal, we have considered the following MOPs projects as step changes because they provide capex/opex trade-offs:

- 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

- targeted pole replacement and reinforcement on two 132kV transmission lines as suggested by EMCa in its review of forecast replacement expenditure.

Our assessment of these step changes is in Appendix B (Step changes).

However, we do not accept TransGrid's revised proposal in relation to insurance and defined benefits. This reflects our position in our draft decision.

In our draft decision, in assessing TransGrid's forecasting method we sought to identify if and where TransGrid's forecasting method departed from our guideline forecasting method. Where TransGrid's forecasting method did depart from our guideline forecasting method we considered whether this departure explained the difference between TransGrid's forecast of total opex and our own. We also considered whether TransGrid's approach was needed to produce an opex forecast that reasonably reflects the opex criteria.

We were not satisfied that TransGrid's forecasting method produced an opex forecast that reasonably reflected the opex criteria. We used the forecasting method described in our Expenditure Forecasting Assessment Guideline (Guideline forecasting method)⁴⁹ to form our alternative forecast of total opex. All opex categories of opex, other than debt raising costs and defined benefits superannuation entitlements, were included in base opex.

A.2 Revised proposal

The most significant difference between TransGrid's opex forecasting method and our guideline forecasting approach is that it uses category specific forecasts for MOPs and insurance and self-insurance premiums. The inclusion of category specific forecasts for major operating projects and insurance and self-insurance premiums, produces a total opex forecast that systematically exceeds the efficient level of opex required by TransGrid to meet the opex objectives. TransGrid's category specific forecasts of its MOPs and insurance costs increased its opex forecast by \$24.7 million (\$2013–14), or 3.5 per cent, compared to leaving these costs in the base and escalating by the rate of change.

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. We discuss this in greater detail in our draft decision.⁵⁰

TransGrid engaged Frontier Economics to assess the AER's opex forecasting method and provide advice on the most appropriate method to forecast opex for the 2014–18

⁴⁹ AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013.

⁵⁰ AER, *Draft decision: TransGrid transmission determination 2015–18*, Attachment 7, November 2014, pp. 21–23.

period.⁵¹ Frontier Economics reiterated that a base-step-trend approach to forecasting opex using a single base year could be appropriate if three conditions were met:⁵²

1. the regulated business has incentives to minimise total controllable opex
2. the business does not have incentives to ‘game’ the regulatory process
3. total controllable opex needs to be broadly recurrent, in that past actual expenditure can provide (with the aid of transparent adjustments) a reasonable reflection of future efficient expenditure.

In relation to the third condition, Frontier Economics clarified that the test for recurrence relates to the stability of opex between regulatory control periods rather than within them.⁵³

Frontier Economics considered these conditions appeared to be broadly met in TransGrid’s case.⁵⁴ It noted that:⁵⁵

- the EBSS applied to TransGrid in the 2009–14 regulatory control period
- TransGrid’s total opex appeared to be sufficiently recurrent to form the basis of a forecast of future efficient opex.

Frontier Economics considered that, in principle, 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.⁵⁶

Frontier Economics also considered when it would be appropriate to adopt a category specific forecast for a category of opex in conjunction with a base-step-trend approach for the remaining opex categories:⁵⁷

The case for utilising a bottom-up approach to forecasting a category of opex in conjunction with a base-step-trend approach for the remaining opex categories requires, at a minimum, evidence that the relevant category of expenditure is likely to follow a capex-style long wave path across multiple RCPs in the future. In addition, the party suggesting a bottom-up approach—whether the network business or the AER—needs to demonstrate that the future path of the expenditure category is of such a magnitude that the observed historical stability of total opex is likely to change as a result of expected changes to the relevant opex category. Only under these circumstances should a bottom-up forecasting approach be considered for a single category or limited number of categories of opex.

⁵¹ TransGrid, *Revised revenue proposal*, January 2015, p. 86.

⁵² Frontier Economics, *Opex forecasting method*, December 2014, p. 4.

⁵³ Frontier Economics, *Opex forecasting method*, December 2014, p. 5.

⁵⁴ Frontier Economics, *Opex forecasting method*, December 2014, p. 5.

⁵⁵ Frontier Economics, *Opex forecasting method*, December 2014, p. 5.

⁵⁶ Frontier Economics, *Opex forecasting method*, December 2014, p. 7.

⁵⁷ Frontier Economics, *Opex forecasting method*, December 2014, p. 7–8.

We have considered the advice of Frontier Economics in our assessment of TransGrid's proposed bottom up forecast for major operating projects, insurance premiums and defined benefits superannuation obligations below.

The EMRF supported our approach to forecasting opex. It stated that if expenditure is reasonably consistent when including a number of activities then, even though there may be variation between elements over time, the sum of the activities can be classed as recurrent.⁵⁸

ElectraNet, however, did not support of our approach to forecasting opex. It stated that where the efficient volume of activities or works for key categories of expenditure vary materially over time it is essential for the expenditure forecasts to take account of the drivers of that forecast variation.⁵⁹ We consider the more pertinent question is whether total opex is broadly recurrent. If total opex is broadly recurrent, regardless of work volumes, and the service provider has a constant incentive to reduce opex, then applying a forecast rate of change to revealed expenditure will produce an opex forecast consistent with the opex criteria. Furthermore, the forecast rate of change will take account of the key drivers of change from one period to the next.

A.2.1 Major operating projects

TransGrid adopted the same bottom-up approach to forecast MOPs expenditure for its revised proposal as it used in its initial proposal. However, it revised its forecast of MOPs expenditure to include additional expenditure for targeted pole replacement and reinforcement on two 132kV transmission lines as suggested by EMCa in its review of forecast replacement expenditure.⁶⁰

TransGrid proposed a bottom-up forecast of MOPs because a revealed expenditure approach 'would be less well suited to taking into account the "lumpy" nature of the expenditure and distinct needs that drive it'.⁶¹

However, as we noted in our draft decision, we make our assessment about the total forecast opex and not about particular categories or projects in the opex forecast. The Australian Energy Market Commission (AEMC) has expressed our role in these terms.⁶²

It should be noted here that what the AER approves in this context is expenditure allowances, not projects.

The question is not about which method is the most suitable method to forecast MOPs. Rather, we need to determine which method produces a total opex forecast consistent

⁵⁸ EMRF, Submission, 6 February 2015, p. 42.

⁵⁹ ElectraNet, Submission, 6 February 2015, p. 2.

⁶⁰ TransGrid, *Revised revenue proposal*, January 2015, p.104.

⁶¹ TransGrid, *Revised revenue proposal*, January 2015, pp.103–104.

⁶² AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. vii.

with the opex criteria. As discussed in our draft decision, using a category specific forecasting method for some opex categories may produce better forecasts for those categories but this may not produce a better forecast of total opex.⁶³

As noted above, Frontier Economics, in its report prepared for TransGrid, stated one of the conditions for applying a base step trend to forecast opex was that total opex should be broadly recurrent. It highlighted that the test for recurrence relates to the stability of opex between regulatory control periods not within them.⁶⁴ It also noted that although TransGrid's historical MOPs expenditure exhibited some intra-period volatility, it was broadly similar between periods.⁶⁵ Frontier Economics agreed that if we apply a single base year approach to forecasting opex, MOPs expenditure ought to be included in the base year.⁶⁶

TransGrid stated that if we apply the approach advised by Frontier Economics consistently to overall controllable expenditure, it accepted the inclusion of MOPs within that overall approach. Otherwise, TransGrid maintained that a bottom-up forecasting approach was the most suitable approach to forecast MOPs.⁶⁷

For the reasons outlined in our draft decision, we are not satisfied that forecasting MOPs on bottom up basis will produce a total opex forecast consistent with the opex criteria. We used our guideline forecasting approach to forecast total opex inclusive of MOPs.⁶⁸ Further, we note that:

- MOPs expenditure was included in the EBSS in the 2009–14 regulatory control period
- forecast MOPs expenditure for the 2014–18 period is broadly consistent with that incurred in the 2009–14 regulatory control period, as noted by Frontier Economics.

TransGrid also noted that its MOPs forecast included specific trade-offs between capex and opex that it considered were not present in its historical costs. Therefore, TransGrid considered we should include the following three projects as capex/opex trade-offs in our alternative forecast:⁶⁹

- 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
- targeted pole replacement and reinforcement on two 132kV transmission lines as suggested by EMCa in its review of forecast replacement expenditure.

⁶³ AER, *Draft decision: TransGrid transmission determination 2015–18*, Attachment 7, November 2014, pp. 21–23.

⁶⁴ Frontier Economics, *Opex forecasting method*, December 2014, p. 5.

⁶⁵ Frontier Economics, *Opex forecasting method*, December 2014, p. 5.

⁶⁶ Frontier Economics, *Opex forecasting method*, December 2014, p. 6.

⁶⁷ TransGrid, *Revised revenue proposal*, January 2015, p.104.

⁶⁸ AER, *Draft decision: TransGrid transmission determination 2015–18*, Attachment 7, November 2014, pp. 23–26.

⁶⁹ TransGrid, *Revised revenue proposal*, January 2015, p.104.

We have considered these MOPs projects as step changes in Appendix B (Step changes).

A.2.2 Insurance and self-insurance

TransGrid proposed a bottom up forecast of insurance of \$26.8 million for the 2014–18 period.⁷⁰ It did not propose any self-insurance. It based its proposed insurance forecast on an estimate from SICorp, the NSW Government self-insurer.⁷¹ TransGrid did not discuss in its proposal why it forecast insurance costs on a bottom up basis rather than including it in base opex. Had it left insurance costs in base opex its opex forecast would have been \$3.8 million (\$2013–14) higher.

However, TransGrid also stated we should apply the base-step-trend approach consistently across all categories of controllable opex in our alternative estimate, as advised by Frontier Economics.⁷²

Consistent with this, we used our guideline forecasting approach to forecast our alternative estimate of total opex inclusive of insurance and self-insurance. As we noted in our draft decision, the market price for insurance can, and does, change at a different rate than total opex.⁷³ However, this is true of many opex cost items. If we separately forecast insurance costs because it increases in price more rapidly than the total opex basket, then we must also separately forecast opex items that increase in price less rapidly to avoid forecasting bias. For this reason, we considered that forecasting the price growth of total opex is likely to be more accurate. Moreover, the NER requires us to form a view on forecast total opex, rather than on subcomponents such as insurance.

ElectraNet did not agree with our approach to forecasting insurance expenditure. It noted that we accepted its forecast cost of insurance for its 2013–18 regulatory control period. It also stated we accepted TasNetworks' forecast cost of insurance, which also did not rely on the revealed expenditure methodology, in our recent draft decision for that business. ElectraNet raised concerns that we selectively adopted approaches that delivered the lowest revenue outcome, rather than provide an opportunity to recover efficient cost.⁷⁴

We recognise that we have changed our approach to forecasting insurance expenditure since our determination for ElectraNet's 2013–18 regulatory control period. However, it is incorrect to say that we accepted TasNetworks' forecast cost of insurance. We accepted TasNetworks' forecast of total opex. This should not be construed as accepting the forecasts of individual categories of expenditure or the method used to derive them. In our draft decision for TasNetworks we raised concerns

⁷⁰ TransGrid, *TransGrid opex model, Forecast opex summary*, January 2015.

⁷¹ TransGrid, *Revenue proposal*, May 2014, p. 136.

⁷² TransGrid, *Revised revenue proposal*, January 2015, p. 86.

⁷³ AER, *Draft decision: TransGrid transmission determination 2015–18*, Attachment 7, November 2014, pp. 26–27.

⁷⁴ ElectraNet, Submission, 6 February 2015, p. 2.

with TasNetworks' use of category specific forecasts for a number of opex categories, including insurance. However, we noted that these category specific forecasts did not systematically produce opex forecasts that exceeded the efficient level of expenditure required by TasNetworks to meet the opex objectives.⁷⁵ We did not include category specific forecasts for insurance in our alternative opex forecasts for both TransGrid and TasNetworks. In both instances this produced higher total opex forecast than using the category specific insurance expenditure forecast proposed by the service provider. We did not selectively adopt the approach that delivered the lowest revenue outcome.

For these reasons, we have not included a category specific forecast of TransGrid's insurance in our alternative forecast of opex.

A.2.3 Defined benefits superannuation obligations

TransGrid adopted the same approach to forecast defined benefits superannuation obligations for its revised proposal as it used in its initial proposal. It included a bottom up forecast of its defined benefits superannuation obligations based on advice from Mercer, the actuary for the Energy Industries Superannuation Scheme to which TransGrid contributes. TransGrid's opex forecasting approach is broadly consistent with our own. It uses a base-step-trend approach to forecast most expenditure. In addition it adopts category specific forecasts for some categories of expenditure including defined benefits superannuation obligations. It considered the forecast cash costs for these entitlements to be more reflective of the costs it incurred in the base year.⁷⁶

Despite the similarities of our forecasting methods, TransGrid stated we should apply the base-step-trend approach consistently across all categories of controllable opex in our alternative estimate. This was based on advice from Frontier Economics.⁷⁷

However, we consider including a category specific forecast for defined benefits superannuation obligations is necessary for forecast opex to be consistent with the opex criteria. We also consider it is consistent with the advice from Frontier Economics.

We have included a category specific forecast of TransGrid's defined benefits superannuation obligations in our alternative forecast of opex for three reasons:

1. defined benefits superannuation obligations were excluded from the EBSS in the 2009–14 regulatory control period
2. defined benefits superannuation obligations follow a capex-style long wave path across multiple regulatory control periods
3. the magnitude of defined benefits superannuation obligations is significant.

⁷⁵ AER, *Draft decision: TasNetworks transmission determination 2015–16 to 2018–19*, Attachment 7, November 2014, pp 18–19.

⁷⁶ TransGrid, *Response to AER TransGrid Opex 001*, pp. 2–3.

⁷⁷ TransGrid, *Revised revenue proposal*, January 2015, p. 86.

Because defined benefits superannuation obligations were excluded from the EBSS in the 2009–14 regulatory control period, TransGrid did not have an incentive to minimise defined benefits superannuation obligations in 2012–13. Consequently we must assess TransGrid's revealed expenditure prior to using it to forecast expenditure for the 2014–18 period. Frontier Economics did not consider the implications of defined benefits superannuation obligations being excluded from the operation of the EBSS during the 2009–14 regulatory control period.

Under the opex incentive framework opex efficiency gains can be shared through three different mechanisms:

1. service providers are provided an ex ante opex allowance and are allowed to retain unspent opex allowances
2. the way in which revealed expenditure influences forecast expenditure
3. EBSS rewards and penalties.

Consequently, it is important to recognise that the opex forecast also plays an important role in sharing efficiency gains or losses with network users. Opex efficiency gains and losses are only shared as intended by the EBSS when these three mechanisms are considered together. The opex factors recognise this by requiring us to have regard to whether the opex forecast is consistent with the EBSS.⁷⁸

When there are non-recurrent increases (or decreases) in opex in the base year, a revealed expenditure forecast will overstate (or understate) opex that reflects the opex criteria. This is because revealed expenditure will include a share of the temporary increase (or decrease) in opex. This is appropriate when an EBSS is in place because the non-recurrent increase or decrease will be balanced through the application of the carryover mechanism. However the EBSS did not apply to defined benefits superannuation obligations in the 2009–14 regulatory control period. Consequently the forecast of total opex should include the best estimate of TransGrid's defined benefits superannuation obligations rather than the revealed costs for this category.

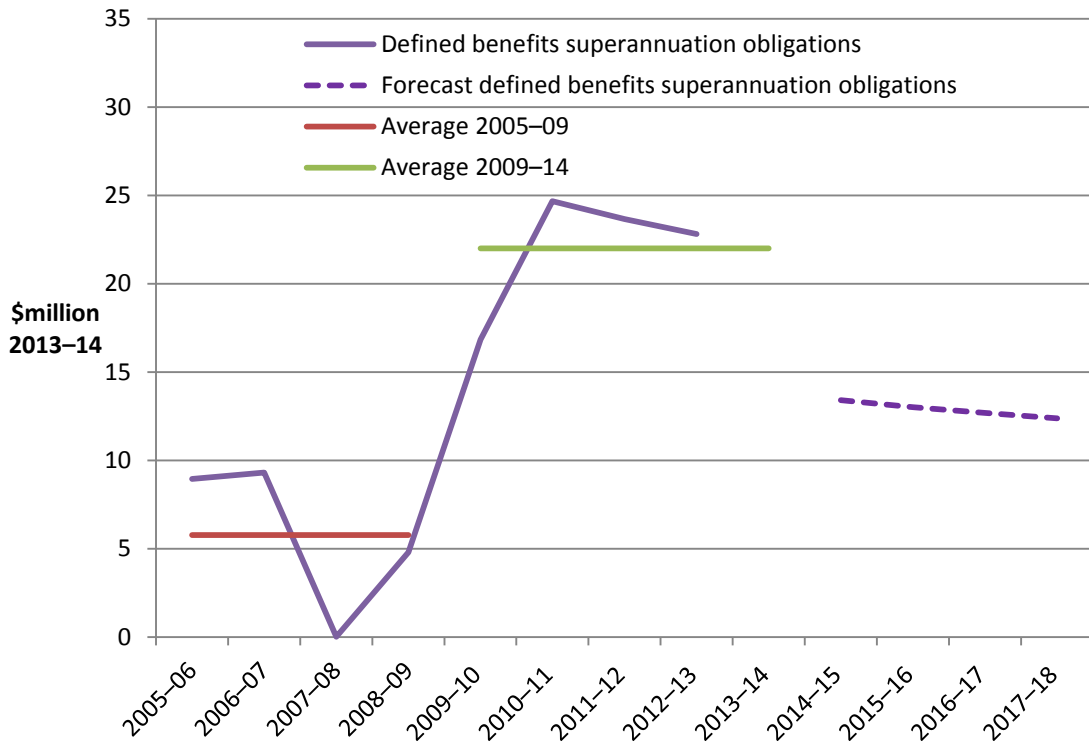
Consistent with the advice from Frontier Economics, we reviewed whether defined benefits superannuation obligations follow a capex-style long wave path across multiple regulatory control periods. We found that obligations in the 2009–14 regulatory control period were approximately four times higher than those in the 2004–09 period (see Figure A.1). Further, TransGrid forecast its obligations in the 2014–18 period to be approximately half those incurred in the 2009–14 regulatory control period. Consequently defined benefits superannuation obligations do follow a capex-style long wave path across multiple regulatory control periods.

The profile of TransGrid's defined benefits superannuation obligations shows the impact of the global financial crisis on financial markets. The defined benefits superannuation obligations TransGrid incurred in the 2009–14 regulatory control period

⁷⁸ NER, cl. 6A.6.6(e)(8)

reflect abnormal financial market conditions resulting from the global financial crisis. They are not reflective of the conditions TransGrid is likely to face in the 2014–18 period.

Figure A.1 Defined benefits superannuation obligations (\$ million, 2013–14)



Source: AER analysis

We then looked at the magnitude of TransGrid's defined benefits superannuation obligations. We found defined benefits superannuation obligations represented 14 per cent of TransGrid's opex between 2009–10 and 2012–13 but only 8 per cent of our alternative estimate of opex for the 2014–18 period. We consider this to be material.

The EMRF supported the AER's approach to forecasting define benefits superannuation obligations:

The purpose of using the base year for setting opex is to minimise the use of bottom up assessments. However, where it can be shown that there is significant volatility over time in a specific element, which then causes similar volatility in the total, it would be unwise to not recognise this reality. Whilst in this case, the provision for the define benefit superannuation scheme is forecast to reduce for the next period, it is just as likely at another time (e.g. just after a major crash in the share market) for the provision to be much greater than what was allowed in the base year. The EMRF sees that the AER has been cognizant of the long term risk to [TransGrid] by excluding this element from the assumption that this cost is stable over time and can therefore be assumed to reflect volatility in the future.

For these reasons we have included a category specific forecast of TransGrid's defined benefits superannuation obligations in our alternative forecast of opex.

B Step changes

Step changes allow for adjustments to the efficient base level of opex to account for changed circumstances in the forecast period that we have not otherwise addressed in our alternative opex forecast.

We typically allow step changes for changes to ongoing costs associated with new regulatory obligations and for efficient capex/opex trade-offs. Step changes may be positive or negative. We would not include a step change if the opex that would otherwise be incurred to reasonably reflect the opex criteria is already covered in another part of our alternative forecast, such as our estimate of base opex or the rate of change.

This Appendix sets out our consideration of step changes in determining our opex forecast for TransGrid for the 2014–18 period.

B.1 Final position

We have included five step changes in our alternative opex forecast. They are for reduced office accommodation costs, revenue reset costs, complying with new regulatory guidelines, the transfer of AEMO system operator functions to TransGrid and major operating projects (MOPs) capex/opex trade-offs. We are not satisfied adding step changes for other cost drivers identified by TransGrid would lead to a forecast of opex that reasonably reflects the opex criteria.

A summary of the revenue impact of our final position compared to TransGrid's revised proposal and our draft position is outlined below in Table B.1. Our detailed reasoning is set out in section B.3.

Table B.1 AER's final position on step changes (\$ million, 2013–14)

	Proposal	Draft position	Revised proposal	Final Position
Change to Sydney office accommodation	-6.4	-6.4	-6.4	-6.4
Payroll efficiencies	-2.6	0	-2.6	0
Closure of Yass control room	-0.3	0	-0.3	0
Revenue reset	1.4	0	1.4	0.3
Rental fees for towers on crown lands	0.5	0	0.5	0
AER's new regulatory guidelines	2.4	0	2.4	2.4
Transfer of AEMO system operator functions	3.7	0	3.7	3.7
Consumer engagement	8.8	0	6.6	0
Demand management innovation	10.2	0	10.4	0
Easement maintenance	6.4	0	4.7	0
MOPs capex/opex trade-offs	0	0	0*	12.4

	Proposal	Draft position	Revised proposal	Final Position
Total	24.0	-6.4	20.3	12.5

* TransGrid did not include a step change for MOPs projects in its revised proposal. Its revised proposal included a bottom-up forecast of MOPs expenditure. However, it considered we should include three MOPs projects as capex/opex trade-offs in our alternative forecast: Numbers may not add up due to rounding.

B.2 Position in draft decision

In our draft decision we included one step change in our alternative opex forecast for savings related to TransGrid's Sydney office accommodation. It was a negative step change of $-\$6.4$ million (\$2013–14). We included a step change because it represented an efficient capex/opex trade-off.

In its original proposal TransGrid proposed 10 step changes totalling \$40.9 million (\$2013–14) over the 2014–18 period. Seven of the step changes were for increases in operating expenditure and three of the step changes were for decreases in operating expenditure.

We did not include nine of the step changes in our draft decision for the following reasons:

- we considered them business as usual costs rather than costs associated with changes in regulatory obligations
- we considered TransGrid did not provide evidence to support the proposed step change or we did not consider its proposed expenditure to be prudent and efficient
- we considered the step changes were accounted for in our forecast productivity growth.

B.3 TransGrid's revised proposal and submissions

TransGrid repropoed the same ten step changes it proposed in its original proposal. However, it reduced the scope and size of its consumer engagement step change.⁷⁹

In its revised proposal, TransGrid did not agree with the position and comments in our draft decision relating to:

- our approach which regards step changes as being compensated for in our forecast productivity growth
- our reduced forecast of the costs of two of the step changes
- our rejection of four of its proposed step changes.

⁷⁹ TransGrid, *Revised revenue proposal*, January 2015, pp. 91-103.

TransGrid did not include a step change for MOPs projects in its revised proposal. Its revised proposal included a bottom-up forecast of MOPs expenditure. However, given our forecasting approach, it considered we should include three MOPs projects as capex/opex trade-off step changes in our alternative opex forecast.⁸⁰ We consider TransGrid did not present substantial new information which requires us to change our position on most of the step changes it repropose. However, we have changed our position on two matters:

- We have changed our position on compensating the cost of new or changed regulatory obligations via our forecast productivity growth. We changed our position because of the difficulty of measuring how much regulatory change is compensated for in our forecast productivity growth.
- We have also changed our position on MOPs. We have included a step change for the three MOPs projects TransGrid proposed as capex/opex trade-offs in its revised revenue proposal.
- In its submission on our draft decision, the Energy Users Association of Australia (EUAA) supported our position on step changes.⁸¹ In its submission, the EMRF supported our approach to using benchmarking of historic opex to assess the actual impacts of step changes as a part of the productivity factor rather than assessing the potential costs of each in isolation.⁸²

B.3.1 Assessment approach

Our assessment approach to step changes in our final decision is the same as the assessment approach in our draft decision⁸³, except for one element. In our final decision we have changed our position that changes in regulatory obligations are accounted for in the 'rate of change' we apply to our estimate of base opex. In this section we discuss our assessment approach, then we discuss why we have changed our position that changes in TransGrid's regulatory obligations are already accounted for in our forecast rate of change.

When assessing a service provider's proposed step changes, we consider whether they are needed for the total opex forecast to reasonably reflect the opex criteria.⁸⁴ Our assessment approach is consistent with the approach specified in our Guideline.⁸⁵

As a starting point, we assess whether the proposed step changes in opex are already compensated through other elements of our opex forecast, such as the base efficient

⁸⁰ TransGrid, *Revised revenue proposal*, January 2015, p.104.

⁸¹ EUAA, *Submission to draft decision and revised proposal*, 6 February 2015, p. 11.

⁸² EMRF, *Submission to draft decision and revised proposal*, 6 February 2015, p. 32.

⁸³ AER, *TransGrid Draft decision 2015–18, Attachment 7 Operating expenditure*, November 2014, pp. 7-46 to 7-48.

⁸⁴ NER, clause 6A.6.6(c).

⁸⁵ AER, *Expenditure forecast assessment guideline*, November 2013, pp.11 and 24. We said we would apply this guideline in our Stage 2, Framework and approach.

opex or the 'rate of change' component. Step changes should not double count costs included in other elements of the opex forecast.

We generally consider an efficient base level of opex is sufficient for a prudent and efficient service provider to meet all existing regulatory obligations. We only include a step change in our opex forecast if we are satisfied a prudent and efficient service provider would need an increase (or decrease) in its opex to meet the opex criteria.

We forecast opex by applying an annual 'rate of change' to the base year for each year of the forecast period. The annual rate of change accounts for efficient changes in opex over time. It incorporates adjustments for forecast changes in output, price and productivity. Therefore, when we assess the proposed step changes we need to ensure that the cost of the step change is not already accounted for in the annual rate of change. The following explains this principle in more detail.

A step change should not double count the costs of increased volume or scale compensated through the forecast change in output. We account for output growth by applying a forecast output growth factor to the opex base year. If the output growth measure used captures all changes in output then step changes that relate to forecast changes in output will not be required. For example, a step change is not required for the maintenance costs of new office space required due to the service provider's expanding network. The opex forecast has already been increased (from the base year) to account for forecast network growth.⁸⁶

By applying the rate of change to the base year opex, we adjust our opex forecast to account for real price increases. A step change should not double count price increases already compensated through this adjustment. Applying a step change for costs that are forecast to increase faster than CPI, will likely yield a biased forecast if we don't also apply a negative step change for costs that are forecast to increase by less than CPI. A good example is insurance premiums. A step change is not required if insurance premiums are forecast to increase faster than CPI because within total opex there will be other categories whose price is forecast to increase by less than CPI. If we add a step change to account for higher insurance premiums we might provide a more accurate forecast for the insurance category in isolation; however, our forecast for total opex as a whole will be too high.

We also adjust our opex forecast to account for changes in productivity by applying a forecast productivity factor to our estimate of base opex. The forecast productivity factor captures 'average' change in technology, business practices, economies of scale and regulatory obligations over time. Our forecast is based on what service providers have been able to achieve in the past. The service provider needs to demonstrate that a proposed step change does not double count the costs of one of these factors.

⁸⁶ This is consistent with our decision in the Powerlink determination; AER, *Final decision: Powerlink transmission determination 2012–17*, April 2012, pp, 164–165.

Further to assessing whether step changes are captured in other elements of the opex forecast, we will assess the reasons for, and the efficient level of, the incremental costs (relative to that funded by base opex and the rate of change) that the service provider has proposed. In particular we have regard to:⁸⁷

- whether there is a change in circumstances that affects the service provider's efficient forecast expenditure
- what options were considered to respond to the change in circumstances
- whether the option selected was the most efficient option—that is, whether the service provider took appropriate steps to minimise its expected cost of compliance
- the efficient costs associated with making the step change and whether the proposal appropriately quantified all costs savings and benefits
- when this change event occurs and when it is efficient to incur expenditure, including whether it can be completed over the period
- whether the costs can be met from existing regulatory allowances or from other elements of the expenditure forecasts.

One important consideration is whether each proposed step change is driven by an external obligation (such as new legislation or regulations) or an internal management decision (such as a decision to increase maintenance opex). Step changes should generally relate to a new regulatory obligation or some change in the service provider's operating environment beyond its control. It is not enough to simply demonstrate an efficient cost will be incurred for an activity that was not previously undertaken. As noted above, the opex forecasting approach may capture these costs elsewhere.

Usually step changes are not required for discretionary changes in inputs.⁸⁸ Efficient discretionary changes in inputs (not required to increase output) should normally have a net negative impact on expenditure. For example, a service provider may choose to invest capex and opex in a new IT solution. The service provider should not be provided with a step change to finance the new IT since the outlay should be at least offset by a reduction in other costs if it is efficient.⁸⁹ This means we will not allow step changes for any short-term cost to a service provider of implementing efficiency improvements. We expect the service provider to bear such costs and thereby make efficient trade-offs between bearing these costs and achieving future efficiencies.

One situation where a step change may be required is when a service provider chooses an operating solution to replace a capital one.⁹⁰ For example, it may choose to

⁸⁷ AER, *Expenditure assessment forecast guideline*, November 2013, p. 11.

⁸⁸ AER, *Expenditure assessment forecast guideline*, November 2013, p. 24.

⁸⁹ We did not accept a step change proposed by SP AusNet for a technology innovation program because such an innovation program should have been self-funding; AER, *Draft decision: SP AusNet Transmission determination 2013–18*, August 2013, pp. 240–241.

⁹⁰ AER, *Expenditure assessment forecast guideline*, November 2013, p. 24; AER, *Explanatory guide: Expenditure assessment forecast guideline*, November 2013, pp. 51–52.

lease vehicles when it previously purchased them. For these capex/opex trade-off step changes, we will assess whether it is prudent and efficient to substitute capex for opex or vice versa. In doing so we will assess whether the forecast opex over the life of the alternative capital solution is less than the capex in NPV terms.

Interaction between historical productivity and step changes

In our assessment approach, we explain that we adjust our opex forecast to account for changes in productivity by applying forecast productivity growth to the forecast base year opex. We use historical productivity growth achieved by a service provider to estimate its future productivity growth.

In our draft decision we stated that an increased regulatory burden in the past typically would reduce productivity growth in that period. If we are using the historical productivity growth to estimate future productivity growth, the historical productivity rate is what service providers were able to achieve while meeting new regulatory requirements introduced at the time.⁹¹ Consequently, service providers will already be compensated for an increased regulatory burden through the forecast productivity growth factor. It would require additional compensation only where it faces greater increases in regulatory obligations than in the past.⁹²

In our draft decision we did not include step changes for changes in TransGrid's regulatory obligations because we considered these were compensated for in our rate of change.

TransGrid rejected our view that step changes in the previous period reduced productivity in that period and that this effect needed to be accounted for if historical estimates of productivity were used to determine productivity in the forecast period. It quoted a report by HoustonKemp which stated that historical step changes were not a reasonable proxy for future step changes and that we had ignored the specific information provided by TransGrid in relation to step changes.⁹³

In our final decision we confirm that a service provider would require additional compensation only where it faces greater increases in regulatory obligations than in the past. However, we have reassessed the robustness of the data we used to estimate the cost of complying with past increases in regulatory obligations. Our productivity forecast for TransGrid has been calculated using the historical average transmission industry productivity, which includes step change expenditure for changing regulatory obligations. However, while we have data on the magnitude of the step changes we approved in the previous period, we do not have data on what each service provider actually spent on new or changed regulatory obligations in the previous period. Because we cannot accurately determine how much regulatory

⁹¹ AER, *Explanatory statement: Expenditure assessment forecast guideline*, November 2013, pp. 52–54, 69 and 72.

⁹² AER *TransGrid Draft decision 2015–18, Attachment 7 Operating expenditure*, pp.65–66.

⁹³ HoustonKemp, *Review of the AER Transmission Network Benchmarking Study & Its Application to Setting TransGrid's Opex Rate of Change*, December 2014, p. 2 and 22.

change is compensated for in the productivity growth component of the rate of change, we have reconsidered our position. Where a service provider can demonstrate that its proposed forecast includes efficient costs due to a changed regulatory obligation we will consider whether the additional costs are accounted for in the productivity growth on a case by case basis. For purposes of this final decision we have assumed that none of the additional costs are compensated for by our forecast of productivity.

Changing our approach has impacted our assessment of three of TransGrid's proposed step changes. These step changes are for revenue reset costs, the cost of complying with new regulatory guidelines and the transfer of AEMO system operator functions to TransGrid.

In this section we re-assess each of the step changes proposed by TransGrid in view of its revised proposal and submissions received, and our change in assessment approach.

B.3.2 Change to Sydney office accommodation

We have included a negative step change of $-\$6.4$ million ($\$2013-14$) in our alternative opex forecast for the change to Sydney office accommodation in our final decision. This is because we consider that the proposed step change savings is an efficient capex/opex trade-off. In other words, it is not a change in overall expenditure; it is essentially a transfer of expenditure between opex and capex. This is consistent with our draft position.⁹⁴

TransGrid reviewed its office accommodation in 2011. It had previously leased office space in the CBD but found the cost was lower to build rather than lease. As a result, it built a new office building above an existing TransGrid building at Ultimo and stopped leasing its Sydney CBD accommodation. The proposed step change reflects the reduced leasing costs, net of the outgoings TransGrid will incur for the new building.

B.3.3 Payroll efficiencies and Closure of Yass control room step changes

Consistent with our draft decision we have not included negative step changes for payroll efficiencies ($-\$2.6$ million) or for savings resulting from the closure of the Yass control room ($-\$0.3$ million) in our alternative opex forecast.

TransGrid re-proposed cost savings realised by payroll processing efficiencies and the closure of its Yass control room as negative step changes in its revised revenue proposal.⁹⁵

We did not include the negative step changes in our alternative opex forecast because when assessing a service provider's proposed step changes, we assess whether they

⁹⁴ AER, *Expenditure assessment forecast guideline*, November 2013, p. 24.

⁹⁵ TransGrid, *Revised revenue proposal*, January 2015, p. 103.

are required for the total opex forecast to meet the opex criteria. We consider efficiency improvements are already accounted for in our forecast productivity growth component of our rate of change estimate. We discuss this in Appendix C (Rate of change).

B.3.4 Revenue reset costs

We have included a step change of \$0.3 million (\$2013–14) in our alternative opex forecast for incremental revenue reset costs. This is because TransGrid incurred costs due to a regulatory change. This is a change in position from our draft decision.

In its original proposal, TransGrid proposed this step change of \$1.4 million for two reasons. Firstly, because revenue reset costs are periodic and were not represented in the base year. Secondly, because revenue reset costs had increased due to the change in information requirements associated with completing the revenue reset Regulatory Information Notice (RIN).⁹⁶

In our draft decision, we did not include a step change for this driver because we considered preparing a revenue proposal was a business as usual expense.⁹⁷ The EMRF agreed that we should not include a step change for reset costs in our opex forecast.⁹⁸

In its revised proposal, TransGrid stated we had ignored the additional regulatory obligations created by our revenue reset RIN compared to the former *Submission Guidelines*.⁹⁹ Prior to 2014, TransGrid had not been issued a RIN relating to a revenue reset. TransGrid estimated the cost associated with the new information requirements in 2014 was \$336 000 spread over two years.¹⁰⁰

We maintain our position that typically we do not include a step change for revenue reset costs. However, we acknowledge that TransGrid has incurred incremental costs due to the new regulatory obligation to submit a revenue reset RIN. Therefore, we have included a step change of \$0.3 million for the incremental cost of submitting a revenue reset RIN in our alternative opex forecast, based on TransGrid's estimation of the cost associated with the new RIN requirements.

B.3.5 Rental fees for communication towers on crown lands

Consistent with our draft position we have not included a step change of \$0.5 million (\$2013–14) in our alternative opex forecast for increased rental fees for communication towers on crown lands. This is because we consider the price growth component of the rate of change accounts for increases in the cost of inputs.

⁹⁶ TransGrid, *Revenue proposal*, May 2014, p.131.

⁹⁷ AER, *TransGrid Draft decision 2015–18, Attachment 7 Operating expenditure*, pp. 88–89.

⁹⁸ EMRF, *Submission to draft decision and revised proposal*, 13 February 2015, p. 36.

⁹⁹ TransGrid, *Revised revenue proposal*, January 2015, pp. 101-103.

¹⁰⁰ TransGrid, *Revised revenue proposal*, January 2015, Table 6.9 Additional costs associated with new information requirements, p. 103.

In its original proposal, TransGrid proposed a step change to reflect rent increases for its 41 communication tower sites on Crown land.¹⁰¹ The Independent Pricing and Regulatory Tribunal (IPART) completed a review of rental fees for Crown Land communication tower sites in NSW in July 2013. TransGrid submitted that the rental fee schedule was updated as part of this review.

In our draft decision we did not include a step change for this driver in our alternative opex forecast. This was because we considered an increase in the rental fees represented a price increase which is already reflected in our forecast of price growth (CPI), which is compensated through our rate of change.¹⁰²

In its revised proposal, TransGrid stated that the price increase is not compensated through the rate of change component. It forecast the increase in rental fees for communication towers on crown lands to be 43 per cent in 2014–15 followed by 9 per cent for the next three years, which is well outside the usual variations in price growth.¹⁰³

We consider the increase input costs is already accounted for in the forecast price growth for all inputs included in the overall rate of change. In arriving at this forecast we only consider it is necessary to specifically consider forecasts in the main input prices that TransGrid faces. We recognise that TransGrid will be subject to other changes in input prices over the forecast period. However, we consider our adjustment for CPI is a reasonable estimate of all other forecast changes in input prices TransGrid faces. TransGrid estimated the cost increase for the higher rent on crown land is \$0.1 million in 2014–15. We consider this increase is not material. We also note that there are also likely to be prices of inputs which do not increase by as much as CPI.

B.3.6 AER's new regulatory guidelines

We have included a step change of \$2.4 million (\$2013–14) in our alternative opex forecast for the increased costs of complying with our new Expenditure forecast assessment guidelines. This is because TransGrid incurred costs due to a regulatory change. This is a change in position from our draft decision.

In its original proposal, TransGrid proposed a step change for the ongoing requirements arising from the AER's Expenditure forecast assessment guidelines of \$2.4 million for the 2014–18 period. TransGrid stated that there were increased requirements to provide information imposed by our guidelines compared with the previous guidelines and regulatory approach. TransGrid stated that the step change amount reflects the reporting and audit costs associated with the new information requirements relating to shared assets and data requested in the annual economic

¹⁰¹ TransGrid, *Revenue proposal*, May 2014, p.125.

¹⁰² AER, *TransGrid Draft decision 2015–18, Attachment 7 Operating expenditure*, November 2014, p. 7-69.

¹⁰³ TransGrid, *Revised revenue proposal*, January 2015, p. 93.

benchmarking and category analysis regulatory information notices (RINs) we issued.¹⁰⁴

In our draft decision we considered the driver of this step change constituted a new regulatory requirement and should be compensated. Our estimate of the efficient costs of complying with our new regulatory guidelines was \$1.1 million (\$2013–14) which was less than the cost TransGrid proposed. However, we did not include a step change in our alternative opex forecast. This was because we considered our productivity estimate already compensated for it.¹⁰⁵

In our draft decision, we considered that TransGrid's proposed internal labour rates and hours and auditing costs were higher than those proposed by other businesses. We compared TransGrid's proposed costs to those of ActewAGL, Jemena Gas Networks (as proxy for Jemena electricity network costs) and TasNetworks. We then scaled TransGrid's proposed costs to the average of the three business' step changes. We stated that as a larger business TransGrid should have the systems in place to better deal with the new requirements than the other smaller businesses.

In its revised proposal, TransGrid did not accept our rationale or alternative estimate. TransGrid stated it is between two and seven times the size of the businesses to which we compared it. It considered that if we benchmark costs, we must take account of differences between networks due to factors such as scale.

TransGrid also stated that the information requirements we imposed were significant, had 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 its revenue proposal. Therefore, TransGrid considered that it was unreasonable for us to assume it would have established systems to automate the compilation of data for the RINs. Further, TransGrid did 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 noted that the allowance the AER proposed for this step change would barely cover the external, competitively sourced, audit costs for the RINs. TransGrid provided invoices for the audits of the October 2014 RIN responses to provide evidence of these costs.

In contrast to TransGrid's revised proposal, the EMRF submitted that we should not allow a step change for increased RIN reporting costs. It submitted that while there may have been initial set up costs, these were once off costs that have already been incurred. It submitted base opex should account for these costs.¹⁰⁶

¹⁰⁴ TransGrid, *Revenue proposal*, May 2014, p.125.

¹⁰⁵ AER, *TransGrid Draft decision 2015–18, Attachment 7 Operating expenditure*, November 2014, pp. 7-50 to 7-52.

¹⁰⁶ EMRF, *Submission to draft decision and revised proposal*, 13 February 2015, p. 36.

Our final position is that we will include a step change for \$2.4 million (\$2013–14) for this driver in our alternative opex forecast. We have changed our position since our draft decision for two reasons:

1. TransGrid provided invoices for the audits of the 2014 RIN responses to provide evidence of higher costs than the \$1.1 million we forecast.
2. We have reconsidered our position that our productivity growth forecast compensates for this step change.

In our draft decision, our assessment approach was not to include step changes for changes in regulatory obligations because we considered our productivity estimate compensated for them. However, as discussed above, we have revised our position on this issue. As a consequence we have included this step change in our alternative opex forecast.

B.3.7 Transfer of AEMO system operator functions

We have included a step change of \$3.7 million (\$2013–14) in our alternative opex forecast for the costs of the transfer of AEMO system operator functions to TransGrid. This is because TransGrid incurred costs due to a regulatory change. This is a change in position from our draft decision.

In its original proposal, TransGrid proposed a step change of \$3.7 million for the transfer of AEMO system operator functions to TransGrid.¹⁰⁷

TransGrid had an operating agreement in place with AEMO, under which AEMO delegated a number of its functions to TransGrid as a system operator in NSW. TransGrid provided these services to AEMO as a non-regulated activity.

From January 2014, TransGrid's operating agreement with AEMO ceased. Instead AEMO requires the functions through instruments of delegation, with AEMO no longer reimbursing TransGrid for these services. TransGrid is now liable for the costs of carrying out these functions and proposed this step change to recover these costs from transmission customers.

In our draft decision we accepted the need for a step change but:

1. questioned the cost proposed by TransGrid for this service
2. considered it was accounted for in our productivity factor.¹⁰⁸

TransGrid charged AEMO annually to carry out a number of functions relating to the management of power system security. In our draft decision we stated that the annual charge was not competitively determined, negotiated or reviewed and that AEMO recovered these costs from customers as market fees.

¹⁰⁷ TransGrid, *Revenue proposal*, May 2014, p. 125.

¹⁰⁸ AER, *TransGrid Draft decision 2015–18, Attachment 7 Operating expenditure*, November 2014, pp. 53–54.

In our draft decision we compared TransGrid's proposed forecast costs with TasNetworks' proposed step change of \$0.4 million per year (\$2013–14) for the change in cost recovery of AEMO delegated functions.¹⁰⁹ We stated the AEMO delegated functions were substantially the same for TransGrid and TasNetworks. Common across both networks is that the AEMO delegated functions are a marginal increment over the functions the business is already required to undertake in operating its own network. While there may be some cost differences associated with differences in network complexity and scale, we considered that the cost differences for the marginal additional work were minimal. For this reason we considered that the efficient costs required to carry out the AEMO delegated functions were those incurred by TasNetworks in 2012–13. This was a cost of \$0.4 million (\$2013–14) per year.

In its revised proposal, TransGrid disagreed with our position that the AEMO operating agreement was not competitively determined, negotiated or reviewed. It stated that for 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.¹¹⁰

TransGrid stated that AEMO's policy required them to negotiate a 'best value' deal, or they would take the service in-house. In both negotiations, AEMO continued to procure the service from TransGrid as it represented better value. While not quite constituting an 'open tender' process, TransGrid stated it:

- required it 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 TasNetworks
- was subject to rigorous review each time the agreement was renegotiated.

Further, TransGrid stated that we 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 did not consider this comparison to be valid. It provided examples of load shedding and oversight costs to demonstrate the indicative impact of managing a larger, more interconnected and complex network.

In response to the additional information, we have revised our decision. We accept TransGrid's proposed forecast of \$3.7 million (\$2013–14) over the 2014–18 period.

In our draft decision, even though we accepted the need for a step change, we considered the costs were more than offset by the productivity estimate we had applied

¹⁰⁹ TasNetworks, *Tasmanian Transmission Revenue Proposal*, 31 May 2014, pp. 84–85; TasNetworks also proposed to absorb this step change as an increase in its productivity. TasNetworks consequently received no allowance for the cost of carrying out the AEMO delegated functions.

¹¹⁰ TransGrid, *Revised revenue proposal*, January 2015, p. 95.

to derive our alternative opex forecast. As a result we did not include this step change in our draft decision.

As discussed above, we have changed our approach on compensation of changes in regulatory obligations through our productivity estimate. TransGrid has demonstrated that its proposed forecast includes efficient costs due to a changed regulatory obligation and consequently, we have included a step change of \$3.7 million (\$2013–14) for the provision of system operator functions in our alternative opex forecast.

B.3.8 Consumer engagement

Consistent with our draft position, we have not included a step change in our alternative opex forecast for consumer engagement. We have not included it because we consider a prudent service provider would already be undertaking the level of consumer engagement commensurate with the rule requirements and so would not need an increase in its forecast total opex. In addition, TransGrid's proposed increase in expenditure does not evidence good practice in that the proposed expenditure does not reasonably reflect the opex criteria.

In its original proposal, TransGrid proposed a step change of \$8.8 million to expand the scope of its stakeholder engagement. It proposed to increase its consumer engagement from its 20 direct customers to all residential and commercial electricity consumers in NSW. The proposed step change included funding for six new staff and system upgrades to support the additional engagement. It also included other funds to facilitate a range of initiatives including workshops, roundtables, presentations, surveys, fact sheets, social media, advertorials, brand refreshment and media training.¹¹¹

In our draft decision, we acknowledged service providers are subject to a new regulatory obligation regarding consumer engagement. Changes to the NER in late 2012 require a service provider to describe in its revenue proposal how it engaged with consumers and how it sought to address any relevant concerns identified as a result of that engagement.¹¹² However, we consider the changed regulatory obligation would not materially increase costs above the base opex of an efficient and prudent service provider. Even without the rule change, we expect a prudent service provider would have programs in place to engage with consumers. For instance, we 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.

¹¹¹ TransGrid, *Revenue proposal*, May 2014, p. 126.

¹¹² AER, *TransGrid Draft decision 2015–18, Attachment 7 Operating expenditure*, November 2014, pp. 79–82.

In its revised proposal, TransGrid repropoed a consumer engagement step change but revised its forecast of the consumer engagement step change from \$8.8 million to \$6.6 million.¹¹³

TransGrid restated that this step change was being driven by the following factors:

- The new rule requirement introduced in 2012 which provides that service providers, in their revenue proposals, must describe how they have engaged with consumers and how they have sought to address any relevant concerns identified as a result of that engagement.
- TransGrid's need to increase its engagement with consumers.
- The expectations set out in our Consumer Engagement Guideline released in 2013.

We assess each of these drivers below.

Rule change

The new rules in respect to consumer engagement would not materially increase costs above the base opex of an efficient and prudent service provider. This is because the rule requirements - to describe in its revenue proposal how it engaged with consumers and how it sought to address any relevant concerns identified as a result of that engagement - are not onerous.

In its rule change determination, AEMC refer to its general approach as "encouraging more timely and meaningful engagement" but it acknowledged that dealing with consumer engagement was generally outside the scope of the rule change.¹¹⁴ The AEMC only addressed consumer engagement to the extent that it could address certain problems with the regulatory process. It stated:

The final rules do not attempt to address perceived problems of engagement of consumers generally. For a start, this would go beyond the Commission's rule-making powers. More conceptually though, this issue is fundamentally about how NSPs and the AER interact with consumers. While the final rules in some areas, such as the expenditure forecasting guideline, requires engagement to occur in a certain way, the rules should provide for the outcomes of engagement, not the engagement itself. Forcing parties to interact is unlikely to be successful in most cases. What is needed is a cultural shift towards greater engagement, and this can only come from the parties themselves. What the final rules provide for in terms of engagement should be seen as a minimum. However, importantly, the rules provide the AER with the ability to

¹¹³ TransGrid, *Revised revenue proposal*, January 2015, p. 99, Appendix K Consumer engagement step change.

¹¹⁴ AEMC, *Rule determination, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, November 2012, p. 36.

have regard to the nature of consumer engagement undertaken by NSPs when evaluating their regulatory proposals.¹¹⁵

TransGrid in its revised proposal accept that the new rules mandate only a minimum level of engagement.¹¹⁶ We consider this would not increase costs above the base year costs of an efficient and prudent service provider.¹¹⁷ This point is further explained below.

TransGrid's level of consumer engagement

TransGrid submitted that it needs to increase its level of engagement regardless of the substantive impact of the rule change:

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.¹¹⁸

TransGrid also stated:

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.¹¹⁹

In relation to TransGrid's submission that its base year does not include broader engagement costs, we note that what matters is not what is in TransGrid's base year expenditure but what we consider base opex should fund. As explained in our draft decision, we consider an efficient service provider would already be engaging with relevant consumers as part of its reset process to help understand their preferences around prices, reliability and service standards. In addition, base opex should already account for customer interaction, complaint handling and the like, as well as interaction with consumer groups.

The base opex allows TransGrid to develop its consumer engagement in line with what we would expect of a prudent and efficient service provider. We note the EMRF's submission that there is room for improvement in how TransGrid factors its consumer

¹¹⁵ AEMC, *Final position paper, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, November 2012, p 18.

¹¹⁶ TransGrid, *Revised revenue proposal*, January 2015, p. 98.

¹¹⁷ By comparison, we do accept that other new regulatory obligations, such as those requiring greater mandatory reporting, are additional costs that are not reflected in base opex.

¹¹⁸ TransGrid, *Revised revenue proposal*, January 2015, p. 98.

¹¹⁹ TransGrid, *Revised revenue proposal*, January 2015, p. 98.

engagement into its revenue proposals.¹²⁰ We consider the base opex would allow TransGrid to improve.

Consumer Engagement Guideline

TransGrid submits that our Consumer Engagement Guideline supports its view that it is obligated to engage with consumers beyond just its directly connected customers and beyond what was required prior to publication of the Guideline¹²¹.

The following clarifies the status and purpose of our Consumer Engagement Guideline. The Guideline is not binding and it is not prescriptive. This is in line with the AEMC's comments above that it did not have a mandate to impose consumer engagement obligations or requirements upon service providers other than as part of the regulatory process. Rather, it sets out a framework for service providers to better engage with consumers. The Guideline gives service providers a high level framework to integrate consumer engagement into their business-as-usual operations.¹²² Implementing the Guideline helps service providers demonstrate how their spending proposals contribute to the objectives contained in the national electricity laws.¹²³ In other words, the Guideline represents the kind of consumer engagement we expect a prudent and efficient service provider would engage in. In its submission on the revised proposal, the CCP supported our conclusion that TransGrid's base year opex allowance provides it with sufficient funds to fulfil the expectations of the Consumer Engagement Guideline.¹²⁴

We agree with this. We also acknowledge that a service provider may do more than what is set out in our Guideline. As we state: "service providers will hopefully develop and implement consumer engagement strategies that go beyond our Guideline."¹²⁵ Service providers may also choose to engage with consumers outside of the five yearly reset process. This understanding is consistent with the AEMC's expectation of an evolving culture of good practice in consumer engagement.¹²⁶ As such, it may be that developments in good practice require a step change. In our Guideline we did not address such cost recovery but noted that we would scrutinise any additional proposed expenditure for consumer engagement in the same manner that we review any costs that a service provider seeks to recover.¹²⁷

Any costs in excess of what is funded from the base year would need to be supported with evidence that such a step change was warranted on the basis of the opex criteria.

¹²⁰ EMRF, *Submission to draft decision and revised proposal*, 13 February 2015, p. 12.

¹²¹ TransGrid, *Revised revenue proposal*, January 2015, p. p. 99.

¹²² AER Consumer Engagement Guideline, Explanatory Statement, p. 23.

¹²³ AER, *Better Regulation: Consumer engagement guideline for network service providers fact sheet*, November 2013.

¹²⁴ CCP6 sub panel, *Submission to draft decision and revised proposal*, 6 February 2015, p. 40.

¹²⁵ AER Consumer Engagement Guideline, Explanatory Statement, p. 23.

¹²⁶ AEMC, *Rule determination, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, November 2012, p115.

¹²⁷ AER Consumer Engagement Guideline, Explanatory Statement, p. 23

In this regard, we need to be satisfied that any expenditure increasing the level of consumer engagement in the regulatory process reasonably reflects the efficient costs of a prudent service provider. Relevantly, the EUAA submitted that it would expect feedback from genuine consumer engagement would lead to changes in services and increases in efficiencies that would more than offset the costs.¹²⁸ We agree that depending on what is proposed by a service provider, it may be that we would need to evaluate any offsetting savings.

In our draft decision we stated that TransGrid's proposed consumer engagement program to extend its consumer engagement to more than three million households and commercial users exceeds the scope of an efficient level of consumer engagement for a transmission service provider. It also exceeds the scope envisaged by our Consumer Engagement Guideline. As such, we consider it does not reasonably reflect the opex criteria.

In its revised proposal, TransGrid submitted that it had taken on board feedback about the scope of its proposed activities, and made a reduction to the scope compared to its revenue proposal. It revised its forecast of the consumer engagement step change from \$8.8 million to \$6.6 million.¹²⁹

However, we consider the revised scope of TransGrid's proposed activities still exceeds the scope of an efficient level of consumer engagement for a transmission service provider. While it is efficient for a transmission service provider to engage with transmission customers, we do not consider it is efficient for it to engage with distribution customers as it is proposing.

We consider TransGrid's base level of opex will provide it with sufficient funds to engage effectively with its direct customer base and to report how it has addressed any relevant concerns in its revenue proposal.

TransGrid submitted that engaging with its direct customer base only does not allow it to engage with other groups such as the Energy Users Association Australia, Energy Markets Reform Forum, the Consumer Challenge Panel (CCP) and other stakeholders.¹³⁰ We support the efficient and strategic engagement with these key user groups but we consider TransGrid's revised proposal still goes beyond this.

As discussed above, TransGrid agreed in principle that engaging with over three million households and commercial users was somewhat exhaustive. It stated that it tailored its engagement plans to engage with consumer representatives, large energy users and business associations. However, despite this tailoring, TransGrid is still proposing a \$6.6 million step increase.

The step increase is for:

¹²⁸ EUAA, *Submission to draft decision and revised proposal*, 6 February 2015, p. 11.

¹²⁹ TransGrid, *Revised revenue proposal, Attachment K Consumer engagement step change*, January 2015, p. 3.

¹³⁰ TransGrid, *Revised revenue proposal, Attachment K Consumer engagement step change*, January 2015, p. 4.

- six additional staff, plus a percentage of a both a senior and general manager
- six consumer workshops per year
- three large energy user roundtables
- CRM system maintenance and licensing
- consumer research surveys
- extra consultation for revenue reset
- other project consultation
- building consumer awareness through adds, factsheets, corporate profile document, communication updates, website maintenance, social media and external stakeholder training.

We note that most of these activities are targeted at distribution customers rather than to its direct customers.

We therefore maintain our draft position that it would be more efficient if most of TransGrid's consultation with smaller customers was done in conjunction with the distribution network service providers. Transmission costs represent around 8% only of a typical household bill and smaller customers wouldn't necessarily differentiate between distribution and transmission costs.

In our draft decision we stated while we had concerns about the scope of TransGrid's proposed consumer engagement programs, we also had concerns about the content and nature of the engagement. One of those concerns was that TransGrid did not identify the net benefits of its engagement program with a clear cost benefit analysis of consumer engagement expenditure. TransGrid did not provide such a cost benefit analysis in its revised proposal.

For the above reasons, we have not included TransGrid's proposed step change in our alternative estimate.

Concerning TransGrid's realisation that it was not engaging sufficiently with consumers, we do not consider this is grounds for including a step change in our total opex forecast.

TransGrid stated that this type of engagement is new for its business and that prior to the 2014–15 Transitional Proposal, it had not engaged with consumers in this way at all. It stated that it requires additional funding to ensure the process meets the needs of today's energy consumer.¹³¹ However, it does not follow that consumers should pay an increase above the base level of opex to fund engagement that TransGrid already should have been undertaking within that allowance.

¹³¹ TransGrid, *Revised revenue proposal, Attachment K Consumer engagement step change*, January 2015, p. 3.

Operating expenditure must reflect the costs a prudent service provider would need to meet the opex objectives. A prudent service provider would already be undertaking an efficient level of consumer engagement so would not require an increase in its forecast total opex.

B.3.9 Increase in demand management innovation allowance

We have not included a step change of \$10.2 million (\$2013–14) in our alternative opex forecast for an increase in the demand management innovation allowance. This is because TransGrid has not identified any capex projects that would be avoided or reduced as a result of the proposed demand management expenditure.

Consistent with our Expenditure Forecast Assessment Guideline, if a step change is not driven by a change in a service provider's regulatory obligations or external environment, the only grounds for including it in our forecast is as a capex opex trade-off. Therefore, we would only include a demand management step change in our opex forecast if the additional opex TransGrid is proposing is offset by at least an equal capex reduction.

TransGrid has not provided us with any evidence that the demand management innovation step change it has proposed would result in any reduction to its capital expenditure. For us to be satisfied that we should provide a demand management step change, TransGrid would need to provide a robust benefit cost analysis demonstrating that the system wide benefits of the proposed demand management program outweigh the costs.

In its original proposal, TransGrid proposed a step change of \$10.2 million for demand management costs. This was in addition to the demand management expenditure included the base year opex.¹³²

TransGrid proposed an increase to its existing allowance for:

- Consumer education regarding demand management and collaboration across the supply chain to overcome regulatory barriers to demand management
- Market research to understand the key drivers of peak demand and business energy behaviour and demand response capacity
- Energy efficiency initiatives for large businesses.

In our draft decision, we did not include this step change. This was because the proposed expenditure was not presented as a capex/opex trade-off or as the result of a new regulatory obligation. It was also because:

- TransGrid had existing spare capacity and we approved \$36.3 million of NCIPAP projects which will further increase its spare capacity.

¹³² TransGrid, *Revenue proposal*, May 2014, p. 42.

- There had been a change in demand conditions with declining growth in peak demand.
- TransGrid had an allowance of \$1 million per year for demand management in its base year.¹³³

We stated TransGrid had not identified any capex projects that would be avoided or reduced as a result of the proposed demand management expenditure. We considered that demand management might be developed as an alternative to undertaking network capex in order to meet network reliability requirements. However, the increased opex would need to be more than offset by reductions in capex.

In its revised proposal, TransGrid stated that even though we rejected the step change because no capex savings had been proposed, the opex factors in the NER require us to have regard to expenditure to address the concerns of electricity consumers. It stated that at its recent workshop on the draft decision and demand management innovation forum, consumer representatives expressed overwhelming support for it to pursue activities that would develop the demand management market. Therefore, TransGrid again proposed this step change in its revised proposal.¹³⁴

We have had regard to the submissions we received on our draft decision and TransGrid's revised proposal, to assess the concerns of electricity consumers regarding TransGrid's proposed expenditure on demand management.

Importantly, the submissions we received did not confirm TransGrid's position that consumers were willing to pay for this level of demand management.

The CCP was opposed to TransGrid's demand management step change. In both its advice on TransGrid's proposed demand management innovation allowance¹³⁵ and its submission on TransGrid's revised proposal¹³⁶ it stated that TransGrid's forecast opex should not include any expenditure for demand management. Further it stated that TransGrid's claims that its consumers are supportive of its proposed DMIA initiatives did not stand up to any scrutiny and had not been subjected to any willingness to pay studies.¹³⁷

The EMRF did not consider that TransGrid requires any allowance to carry out investigation into demand management. The EMRF considered that for a transmission network facing declining demand, with few direct customers, investigation into demand management practices was inappropriate and unnecessary.¹³⁸

¹³³ AER, *TransGrid Draft decision 2015–18, Attachment 7 Operating expenditure*, November 2014, p. 7-53, 82-86.

¹³⁴ TransGrid, *Revised revenue proposal*, January 2015, p. 17, 100.

¹³⁵ CCP6 sub panel, *Advice on TransGrid's proposed demand management innovation allowance*, 18 September 2014, p4.

¹³⁶ CCP6 sub panel, *Submission to draft decision and revised proposal*, February 2015, p. 48.

¹³⁷ CCP6 sub panel, *Submission to draft decision and revised proposal*, February 2015, p. 49.

¹³⁸ EMRF, *Submission to draft decision and revised proposal*, February 2015, pp. 39 and 44.

The EMRF and EUAA¹³⁹ considered that there should not be any further allowance for TransGrid to carry out research or other demand management activities until it can demonstrate that the funds provided so far have resulted in it implementing demand management practices that have benefited consumers.

We are not satisfied that TransGrid provided sufficient information for us to change our position on the demand management step change as it did not address our concerns regarding:

- no proposed capex-opex trade-off
- spare capacity
- \$36.3 million we approved of NCIPAP projects which will further increase its spare capacity
- a change in demand conditions with declining growth in peak demand.

B.3.10 Easement maintenance

Consistent with our draft position we have not included a step change in our alternative opex forecast for easement maintenance. We have not included it because we consider easement maintenance is an ongoing activity and that variations in expenditure will be addressed through the EBSS carryover. In this instance, TransGrid will receive a payment for not doing the easement maintenance work in the 2009–14 regulatory control period. As a result, if we were to increase the opex allowance in the 2014–18 period for easement maintenance, we would overcompensate TransGrid. We discuss the mechanics of this below.

In its original proposal, TransGrid stated that the base year expenditure for easement maintenance was not reflective of recurrent expenditure as there was an eight month break in easement maintenance in one region due to an issue with safety performance. TransGrid proposed that \$2 million be reinstated into the base year to account for the eight months of expenditure that was not undertaken. In addition it proposed a step change to allow for the maintenance to be caught up over the routine easement maintenance cycle. It also indicated that the step change included cost increases due to a change in the work health and safety legislation, vegetation contract rates and community expectations.¹⁴⁰

We did not include TransGrid's proposed easement maintenance step change in our draft decision. This was for four reasons:

1. We considered the expenditure to be normal variations in business as usual activities or expenditure that is captured in the price growth forecast. In addition,

¹³⁹ EUAA, *Submission to draft decision and revised proposal*, 6 February 2015, p. 11.

¹⁴⁰ TransGrid, *Revenue proposal*, May 2014, p. 126.

2. We did not consider changes in volume or scale or the costs of discretionary changes in inputs, constituted step changes. We considered these costs were accounted for in the rate of change we apply to base opex.
3. Its EBSS reward has been increased by not incurring this expenditure in the base year. This increased reward provides it with its efficient opex to undertake the deferred works.
4. We did not consider the introduction of the nationally consistent WHS Act 2011 materially increased the regulatory burden imposed on TransGrid.¹⁴¹

In its revised proposal, TransGrid stated that it did not consider that additional expenditure to catch up on easement maintenance was a normal variation in business as usual activities. It stated the break in easement maintenance was a material change in business activity and costs, which presented a significant challenge for the business. TransGrid stated it was aware of the broader financial impact of the decision, given it occurred in the base year. However, it stated it was obliged to put the safety of all persons working for it first and should not be penalised for this.¹⁴²

We consider that delays, including those due to contract re-negotiation, creating expenditure fluctuations, are a normal part of business. As expenditure for some categories is higher than usual in a given year, other categories will be lower than usual. That is, within total opex we would expect to see variation in the composition of expenditure from year to year. If we were to include a step change for cost categories where TransGrid underspent in the base year, but did not do the same for categories where TransGrid overspent, then the total opex forecast would systematically overstate the efficient opex required by a prudent service provider.

We do not consider TransGrid has demonstrated that it is being penalised for deferring the easement maintenance work, when in fact it will receive an increased EBSS reward by not incurring this expenditure in the base year.

TransGrid operates under an ex-ante incentive regime. It is allowed to keep any difference between its approved forecast and its actual opex during a regulatory control period to encourage it to become more efficient. The EBSS supplements this by providing the service provider with an additional reward for incremental opex reductions and additional penalties for incremental opex increases. In total these rewards and penalties work together to provide a constant incentive for a service provider to pursue efficiency gains over the regulatory control period.

Where there is a temporary reduction in opex in the base year used to set the opex forecast, the opex forecast may not reflect the ongoing level of efficient opex by itself. However, the temporary reduction will lead to a positive EBSS carryover that will, in effect, compensate the service provider for the lower forecast. TransGrid stated it did not undertake \$2 million in easement maintenance expenditure in 2012–13. As a result

¹⁴¹ AER, *TransGrid Draft decision 2015–18, Attachment 7 Operating expenditure*, November 2014, p. 7-76 to 7-79.

¹⁴² TransGrid, *Revised revenue proposal*, January 2015, p. 97.

of this lower expenditure, TransGrid would have received a positive EBSS carryover amount.¹⁴³ We must take this carryover amount into consideration when assessing total opex. This is because when setting our opex forecast the opex factors require us to have regard to whether it is consistent with the EBSS.¹⁴⁴ Taking the larger carryover amount into consideration, we would overcompensate TransGrid if we were to increase the opex allowance in the 2014–18 period for easement maintenance.

TransGrid indicated that the step change also includes cost increases due to a change in the work health and safety legislation, vegetation contract rates and community expectations.

In its revised proposal, TransGrid stated:

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.¹⁴⁵

In effect, TransGrid is proposing that we treat efficiency losses differently to efficiency gains. This is inconsistent with the opex factors, the requirements of the EBSS and the long term interests of consumers.

The opex factors state that we must have regard to the desirability of both rewarding transmission network service providers for efficiency gains and penalising them for efficiency losses.¹⁴⁶ It is important that the incentive for reducing costs is the same as for increasing costs so a business has an incentive to defer a project only when it is efficient to do so. Clearly, it would not be in the interests of consumers to reward a service provider for efficiency gains but not penalise it for efficiency losses.

Finally, 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'.¹⁴⁷ This may be the case, however, we provide a total opex allowance which TransGrid is free to spend when and where it needs, to most efficiently meet its priorities.

¹⁴³ In its initial proposal, TransGrid proposed to reinstate the uncompleted maintenance expenditure into its base year for both calculating the EBSS and forecasting opex. This had the effect of reducing TransGrid's EBSS carryovers but increasing its opex forecast for the 2014–18 period. 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. Therefore, TransGrid received a positive EBSS carryover amount as a result of the maintenance underspend.

¹⁴⁴ NER, clause 6A.6.6(e)(8).

¹⁴⁵ TransGrid, *Revised revenue proposal*, January 2015, p. 97.

¹⁴⁶ NER, clause 6A.6.5(b)(2).

¹⁴⁷ TransGrid, *Revised revenue proposal*, January 2015, p. 97.

B.3.11 Major operating projects capex/opex trade-offs

TransGrid noted that its major operating projects (MOPs) forecast included specific trade-offs between capex and opex that it considered were not present in its historical costs. Therefore, TransGrid considered we should include the following three projects as capex/opex trade-offs in our alternative forecast:¹⁴⁸

- 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
- targeted pole replacement and reinforcement on two 132kV transmission lines as suggested by EMCa in its review of forecast replacement expenditure.

Consequently we have considered these MOPs projects as step changes.

Frontier Economics, in a report for TransGrid, looked at how we should treat capex/opex trade-offs. It stated that where the network identifies a more efficient opex-based alternative to a capex option we should include the additional opex as a step change.¹⁴⁹ Frontier Economics cites the following example:¹⁵⁰

For example, I understand that TransGrid has proposed a lower cost part-capex, part-opex alternative to replacing a 132 kV transmission line. I further understand that TransGrid's base year opex (and entire previous RCP opex) has no expenditure of a similar nature. This means that a strict base year-derived approach to forecasting opex would under-compensate TransGrid for pursuing such an alternative.

We broadly agree with Frontier Economics. In our Guideline we state that 'if it is efficient to substitute capex with opex, a step change may be included for these costs (capex/opex trade-offs).'¹⁵¹ We sought further information from TransGrid regarding what Frontier Economics meant by its statement that the previous regulatory control period had no expenditure of a similar nature. TransGrid stated:¹⁵²

The reference to "no expenditure of a similar nature" means that no operating expenditure was incurred for decommissioning assets without their replacement in the previous period. Where assets are replaced, the decommissioning and disposal of the old asset is capital expenditure as it is capitalised against the new replacement asset. However, where an asset is decommissioned and disposed of without being replaced, there is no asset to which the decommissioning and disposal costs can be capitalised. Therefore, the

¹⁴⁸ TransGrid, *Revised revenue proposal*, January 2015, p.104.

¹⁴⁹ Frontier Economics, *Opex forecasting method*, December 2014, p. 8.

¹⁵⁰ Frontier Economics, *Opex forecasting method*, December 2014, p. 8.

¹⁵¹ AER, *Expenditure Forecast Assessment Guideline for Electricity Transmission*, November 2013, p. 24.

¹⁵² TransGrid, *Response to information request TransGrid R2*, 1 March 2015, p. 1.

decommissioning and disposal costs are operating expenditure. This is a new occurrence for TransGrid with demand forecasts moderating.

We accept this reasoning and on this basis have included a step change for the following MOPs projects in our alternative estimate of total opex:

- the decommissioning of a 132kV transmission line in the Central West of NSW
- the decommissioning of an equipment monitoring system at Haymarket
- targeted pole replacement and reinforcement on two 132kV transmission lines as suggested by EMCa in its review of forecast replacement expenditure.

We reviewed the options analysis undertaken by TransGrid for each of these projects and are satisfied that the options proposed by TransGrid are the least cost options. Consequently we have included an opex step change totalling \$12.4 million (\$2013–14) for these projects.

C Opex rate of change

Our forecast of total opex includes an allowance to account for efficient changes in opex over time.

There are several reasons why opex that reflects the opex criteria for each year of a regulatory control period might differ from expenditure in the base year.

As set out in our Expenditure Forecast Assessment Guideline (Guideline), we have developed an opex forecast incorporating the rate of change to account for the following factors:¹⁵³

- price growth
- output growth
- productivity growth.

This Appendix contains our assessment of the opex rate of change for use in developing our forecast estimate of total opex.

C.1 Assessment approach

We have taken an excerpt from section 7.3 of this Attachment (Assessment approach) to provide context on what the rate of change measures.

The rate of change captures the year on year change in efficient expenditure. Specifically it accounts for forecast changes in output levels, prices and productivity (such as economies of scale). These three opex drivers should explain all changes in efficient opex. The output and productivity growth variables capture the forecast change in the quantity of opex inputs required. The real price growth variable captures the forecast change in the prices of those inputs.

The annual rate of change is forecast as:

$$\Delta Opex = \Delta input\ price + \Delta output - \Delta productivity$$

Where Δ denotes the proportional change in a variable.

Price growth is made up of labour price growth and non-labour price growth (which includes materials). The change in prices accounts for the price of key inputs that do not move in line with the CPI and form a material proportion of TransGrid's expenditure.

'Output growth' captures the change in expenditure due to changes in the level of outputs delivered, such as increases in the size of the network and the customers

¹⁵³ AER. *Better Regulation explanatory statement expenditure forecast assessment guideline*, November 2013, p. 61.

serviced by that network. An increase in the quantity of outputs is likely to increase the efficient opex required to service the outputs.

At a broad level, productivity measures the effectiveness of a service provider at using its inputs to generate outputs.

We based our productivity measure on the electricity transmission industry's historical productivity growth in producing outputs over its inputs.

Since we take both outputs and inputs into account, our productivity measure accounts for labour productivity and economies of scale. The effect of industry wide technical change is also included.

C.2 Position

The primary difference between TransGrid's and our rate of change is the output growth and productivity growth measures.

We have adopted the multilateral total factor productivity (MTFP) framework, to determine the output weights, and opex partial factor productivity (PFP), to measure productivity growth.

We consider our approach more reasonably reflects the opex criteria. It addresses concerns we have with TransGrid's proposed approach to accounting for output growth and productivity growth.

In its revised proposal, TransGrid maintained its initial proposal approach of applying network growth related capex, economies of scale and negative step changes to forecast output growth and productivity growth. TransGrid raised concerns with our use of MTFP and opex PFP. But it did not address our concerns with its approach to accounting for output growth and productivity growth.

TransGrid did not respond to our primary concern that network growth related capex is an input and an indirect measure of the change in opex outputs. We also considered price and capital value changes affect this measure and these changes should have no impact on opex.¹⁵⁴

We do not consider TransGrid's output growth and productivity growth is reasonable and we have adopted our measure for the following reasons:

- TransGrid's measure does not take into account the actual change in the quantity of outputs. For example TransGrid's measure does not take into account a decrease in its line length.
- TransGrid's network growth formula is not a pure quantity measure as it also includes price growth which should have no effect on the quantity of opex.

¹⁵⁴ AER, *Draft decision TransGrid transmission determination 2015–16 to 2017–18 Attachment 7: operating expenditure*, November 2014, p. 110.

- TransGrid's productivity measure does not take into account all sources of productivity.
- Economic Insights do not agree with TransGrid's and HoustonKemp's criticisms of our alternative estimate of output growth and productivity growth.¹⁵⁵

We discuss these reasons in detail in the sections below.

We have used the same rate of change method to derive our alternative opex as we used for our draft decision. This approach is consistent with our guideline approach which aimed to address the issues we have identified in TransGrid's approach. For example, our Guideline approach to measuring productivity is a single measure that includes all sources of productivity.¹⁵⁶

This rate of change is lower than TransGrid's revised proposal.

For price growth, TransGrid adopted our labour price growth method. However it has continued to apply a category specific forecast to its insurance expenditure. We do not consider a mixture of category specific forecasts for some opex categories and general price growth for the remaining opex is reasonable. We have also updated our price growth to reflect the most recent labour forecasting data from our consultant Deloitte Access Economics (DAE) and TransGrid's consultant BIS Shrapnel. Table C.1 shows TransGrid and our forecast for each rate of change component and the overall rate of change.

Table C.1 Forecast rate of change (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid				
Price growth	0.52	0.83	0.92	1.17
Output growth	3.33	2.25	1.18	0.23
Productivity growth ¹⁵⁷	2.39	2.30	0.45	0.12
Overall rate of change	1.38	0.73	1.66	1.28
AER				
Price growth	0.43	0.39	0.57	0.78
Output growth	1.31	0.45	0.20	0.52

¹⁵⁵ Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015

¹⁵⁶ AER, *Explanatory statement draft expenditure forecast assessment guidelines for electricity transmission and distribution*, August 2013, p. 36

¹⁵⁷ An increase in productivity results in a decrease in opex and the opex rate of change.

We note that TransGrid has included an opex/capex trade-off step change for its Sydney accommodation in its productivity forecast. We have assessed this in our step change assessment and we have not included this as a part of forecast productivity.

	2014–15	2015–16	2016–17	2017–18
Productivity growth	0.86	0.86	0.86	0.86
Overall rate of change	0.88	-0.02	-0.10	0.43
Difference	-0.51	-0.76	-1.76	-0.85

Source: AER analysis

C.3 Draft position

In our draft decision we did not adopt TransGrid's forecast rate of change. Our rate of change was on average 1.12 per cent lower than TransGrid's. The difference in the rate of change accounted for \$11.6 million (\$2013–14) of the difference between TransGrid's proposed opex and our draft decision estimate. The approach we adopted in the draft decision was consistent with our Guideline approach to forecasting the rate of change.¹⁵⁸

We considered the main driver of the difference between the rate of change forecasts was output growth. We did not consider TransGrid linking its output growth to its capex was reasonable. This is because capex is an input rather than an output. So we adopted Economic Insights' output specification based on its economic benchmarking.

We also did not consider TransGrid's forecast of productivity growth was reasonable. TransGrid based its forecast on its economies of scale which is dependent on output growth.

For price growth, we did not accept TransGrid's forecast of insurance price growth because it was not reasonable to do a category specific forecast for just a sub-component of opex without regard to other opex components. We also did not accept TransGrid's labour forecasts from its consultant BIS Shrapnel because it has over forecast labour prices in the past. To forecast price growth we adopted an average of TransGrid's consultant BIS Shrapnel and our consultant DAE's forecast. We noted in the past that BIS Shrapnel's forecasts were too high and DAE's forecasts were too low so we considered an average best reflects the labour price growth.

C.4 Revised proposal and submissions

In its revised proposal, TransGrid did not adopt our draft decision rate of change. TransGrid engaged HoustonKemp to examine our benchmarking models. Citing this evidence, TransGrid did not consider our MTFP and opex PFP was robust and therefore our output growth and productivity growth measures were not robust. However, TransGrid adopted our price growth methodology.¹⁵⁹

¹⁵⁸ AER, *Draft decision TransGrid transmission determination 2015–16 to 2017–18 Attachment 7: operating expenditure*, November 2014, p. 90.

¹⁵⁹ TransGrid, *Revised revenue proposal*, January 2014, pp. 89–91.

We note TransGrid did not address many of the issues we raised regarding their forecast output growth and productivity growth in its revised proposal. TransGrid also did not provide additional evidence to show why their approach to forecasting the rate of change would produce an opex forecast that better reflects the opex criteria.

In the sections below we discuss our concerns with TransGrid's rate of change, respond to TransGrid's criticisms of our MTFP and opex PFP analysis and discuss the overall impact of each rate of change component.

We note that we have made an amendment to our step change methodology in response to TransGrid's revised proposal on the interaction between step changes and productivity. We discuss this in more detail in Appendix B, section B.3.1.

C.4.1 Our concerns with TransGrid's method of forecasting the rate of change

We raised a number of concerns in our draft decision with TransGrid's methodology to forecasting output growth and productivity growth. TransGrid did not address these concerns in its revised proposal.

In its revised proposal, TransGrid applied its forecast 'network growth' to account for output growth. It forecast 'network growth' as the proportion of growth related capex over the total replacement value of its network. TransGrid applied economies of scale factors to its output growth and identified negative step changes to account for productivity growth.

We do not consider TransGrid's method to forecast its rate of change is reasonable. TransGrid's output growth methodology overestimates the actual change in the quantity of services it is required to provide to its customers. This is because TransGrid based its output growth on its capex, which is an input rather than an output.

Further, TransGrid's productivity growth is not reasonable because it does not account for all sources of productivity. TransGrid's economies of scale factors are estimated and are not based on industry performance.

TransGrid partially adopted our price growth approach in its revised proposal. However, it did not adopt our approach to forecasting output growth and productivity growth. Instead TransGrid adopted the same approach it used in its initial proposal.

For the reasons outlined in this final decision we are not satisfied that TransGrid's approach to forecasting output growth and productivity growth produces an opex forecast that reasonably reflects the opex criteria. Consequently, we have adopted our alternative forecast of output growth and productivity growth using 2006–13 TNSP benchmarking data and TransGrid's reset RIN.

The sections below discuss our concerns with TransGrid's network growth, economies of scale, negative step changes and price growth.

Network growth and economies of scale

A primary driver of the forecast rate of change is forecast output growth. However, output growth should reflect the actual change in services provided to customers rather than just the change in the value of assets. TransGrid's approach does not measure the change in the quantity of services it is required to provide.

To calculate network growth TransGrid adopted the following formula:

$$\text{Network growth} = \frac{\text{Forecast capital expenditure resulting in a change to network size}}{\text{Replacement value of network}}$$

To account for output growth, TransGrid forecast the change in 'network size' and adjusted this for economies of scale. This links opex with capex adjusted for economies of scale to reflect the change in opex required to operate and maintain TransGrid's network or the change in services its customer require.

In our draft decision we noted that capex was an input and affected by price growth.¹⁶⁰ Further, capex itself relies upon its forecast output growth because the expected change in line length and maximum demand drives growth related capex.

Output growth should measure the change in the quantity of services provided. Ideally a direct measure should be used. A direct measure measures the actual change in the quantity of the output. An indirect measure measures another variable that is assumed to be correlated to the output of interest.

TransGrid's approach is an indirect measure because it measures the quantity of capital to meet the demand for its services. However, an increase in capital does not necessarily result in the same increase in opex. To account for this TransGrid applied economies of scale which it considered to be reasonable because we accepted this approach in previous decisions.¹⁶¹ We also note that since capex and the replacement value of the network includes price growth, TransGrid's network growth includes price growth. This is not reasonable because the change in the price of capex should not affect opex. We have accounted for price growth in a separate component of the rate of change.

Further, TransGrid's methodology is not reasonable because it forecasts a network size increase higher than its forecast change in the quantity of those assets. This is because TransGrid based its change in network size on its capex rather than actual changes.

Two of the main drivers of TransGrid's network growth exceed its own forecast growth reported in its reset RIN. Table C.2 shows TransGrid's network size increase in line

¹⁶⁰ AER, *Draft decision TransGrid transmission determination 2015–16 to 2017–18 Attachment 7: operating expenditure*, November 2014, p. 110.

¹⁶¹ TransGrid, *Revised revenue proposal*, January 2015, p. 90.

length and substations compared to its own forecast growth in line length and ratcheted maximum demand.¹⁶²

Table C.2 Network size changes (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid proposal				
Lines	3.29	2.18	0.00	0.00
Substations	3.80	2.67	0.59	0.20
TransGrid's reset RIN				
Circuit length	1.46	0.00	0.00	-0.73
Ratcheted maximum demand	-	-	-	-

Source: TransGrid opex model revised proposal and TransGrid's reset RIN.

In its revised proposal TransGrid stated that it proposed a very modest output growth to reflect the minimal growth expected in its network over the upcoming period.¹⁶³ As shown in Table C.2, TransGrid's network growth used to calculate its increase in opex is higher than its forecast change in these assets. We also note that TransGrid proposed substantial growth in its substation opex for 2014–15 and 2015–16 even though it forecast no growth in its maximum demand. To offset this growth, TransGrid forecast minimal economies of scale for lines and substations.¹⁶⁴

TransGrid proposed the same economies of scale factors that it proposed for its 2009–14 determination. TransGrid identified the incremental effort needed to service additional assets by identifying the relationship between its asset base and each opex category.¹⁶⁵

We note that we accepted TransGrid's economies of scale in our determination for the 2009–14 regulatory control period. Our consultant PB noted that TransGrid's model assumed that the amount of additional opex directly related to the increase in new assets under management.¹⁶⁶ PB also noted that there was no quantitative data available but considered TransGrid's economies of scale factors were reasonable based on its industry experience.¹⁶⁷

¹⁶² We note TransGrid also proposed growth drivers for communications, secondary systems and land and easements. However, these are input cost categories rather than outputs and there is no corresponding output measure in TransGrid's reset RIN.

¹⁶³ TransGrid, *Revised revenue proposal*, January 2015, p. 90.

¹⁶⁴ TransGrid, opex model - input - general worksheet. TransGrid proposed a 95 per cent economies of scale factor for lines and substations. This means that a one per cent increase in size results in a 0.95 per cent increase in costs.

¹⁶⁵ TransGrid, *Revised revenue proposal*, January 2015, p. 87.

¹⁶⁶ PB, *TransGrid revenue reset*, 12 November 2008, p. 223.

¹⁶⁷ PB, *TransGrid revenue reset*, 12 November 2008, p. 211

Since economies of scale factors represent the incremental effort in servicing additional assets, TransGrid should have applied it to the quantity of new assets rather than the capex for new assets. As shown in Table C.2 TransGrid proposed a 3.29 per cent increase in lines for 2014–15. It adjusted this with a 95 per cent economies of scale factor resulting in a 3.13 per cent increase in lines opex. This growth in lines opex exceeds TransGrid's own forecast growth in line length of 1.46 per cent in 2014–15. This shows that TransGrid's output growth does not reflect the change in quantity of services but rather a function of its capex values. We do not consider a change in the capital value of an asset should affect the opex related to that asset.

We consider TransGrid's methodology could be reasonable if its forecast network growth reflected the actual change in the quantity of those assets used to provide outputs. However, the value of TransGrid's capex as a proportion of its total network value adjusted for economies of scale increases at a greater rate than the actual growth in those assets.

We also consider TransGrid's network growth methodology is biased because it only including increases in assets but not decreases in assets. TransGrid identified a major operating project related to the decommissioning of a 132kV transmission line in the Central West of NSW.¹⁶⁸ We would expect a decrease in the number of assets TransGrid must maintain would result in a decrease in its opex. However, TransGrid's network growth formula only includes capex.

We considered TransGrid's indirect measure of network growth and its impact on opex to be reasonable in the past when there was less data available. However, the 2006–13 TNSP economic benchmarking RIN and TransGrid's reset RIN provides a consistent basis to directly measure the actual and forecast change in the quantity of outputs.

TransGrid did not amend its approach in response to our draft decision. Neither did it address the concerns we raised in our draft decision. We are not satisfied TransGrid's approach to accounting for output growth produces an opex forecast that reasonably reflects the opex criteria. We have adopted our alternative output growth methodology for developing an alternative forecast.

We discuss TransGrid's criticisms of our output growth methodology in section C.4.2 and we discuss the impact of the differences between the two approaches in section C.4.3 and section C.4.4.

Negative step changes

In addition to economies of scale, TransGrid proposed negative step changes as a source of productivity growth. In our draft decision we assessed its negative step changes under our step change assessment approach.

¹⁶⁸ TransGrid, *Revised revenue proposal*, January 2015, p. 104.

TransGrid proposed the following step decreases as a source of productivity growth:

- change to Sydney office accommodation –\$6.5 million (\$2013–14)
- payroll efficiencies –\$2.6 million (\$2013–14)
- closure of Yass control room –\$0.3 million (\$2013–14).¹⁶⁹

As discussed in section B.3.2 of our step change Appendix, we consider the change to Sydney office accommodation to be a capex/opex trade-off rather than productivity growth. We consider the other two step decreases to be sources of productivity and this demonstrates that TransGrid has considered efficiency gains in the forecast period.

Therefore TransGrid forecast \$2.9 million in efficiency savings for the 2014–18 period. Although TransGrid has identified some efficiency savings, we consider TransGrid's bottom up forecasting methodology does not include all potential efficiency gains, such as technical change, in the rest of its opex. We have not estimated an alternative bottom-up productivity forecast. Instead we have estimated the overall opex productivity, which includes technical change and economies of scale, for TransGrid and the rest of the electricity transmission industry.

We discuss the difference between TransGrid's productivity forecast and our productivity approach, which includes technical change, in section C.4.4.

Price growth

We note TransGrid included changes to its insurance premiums as a part of its price growth. TransGrid's forecast insurance prices are a category specific forecast. We do not consider TransGrid's category specific forecasts are reasonable and we discuss this in Appendix A with our assessment of TransGrid's forecasting method (see section A.2.2).

C.4.2 Application of economic benchmarking

Given our concerns regarding TransGrid's approach to forecasting output growth and productivity growth discussed above, we applied MTFP and opex PFP as an alternative to calculate output weights and measure productivity respectively.

To forecast output growth and productivity, Economic Insights used our economic benchmarking data to estimate the output weights and historical productivity growth.¹⁷⁰

¹⁶⁹ TransGrid, *Revised revenue proposal*, January 2015, p. 90 and AER, *Draft decision TransGrid transmission determination 2015–16 to 2017–18 Attachment 7: operating expenditure*, November 2014.

¹⁷⁰ Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian Electricity TNSPs*, 10 November 2014.

We consider the economic benchmarking analysis we have done is robust and addresses our criticisms of TransGrid's approach to forecasting output growth and productivity growth for the following reasons:

- it directly measures the change in outputs TNSP customer require
- it includes all significant outputs that have the largest impact on opex
- it estimates productivity from observed industry outcomes
- it includes all sources of productivity growth such as economies of scale and technical change
- index numbers are a simple and robust methodology with rigorous grounding in economic theory and readily reproducible.¹⁷¹

In response to our draft decision TransGrid engaged Houston Kemp to examine our benchmarking models. HoustonKemp and TransGrid considered our economic benchmarking was not robust because:

- the output weights have wide confidence intervals and are sensitive to sample size
- Houston Kemp's alternative models led to different output weights and relative efficiency rankings
- opex PFP is sensitive to different assumptions.¹⁷²

Economic Insights considered each of these criticisms and did not think our approach required any changes.¹⁷³ We agree with Economic Insights and we have not amended our approach. We discuss TransGrid and HoustonKemp's criticisms and our response to each criticism below.

Output weight sensitivity

We consider the sensitivity of our output weights does not indicate that our forecast of the output weight is not the best estimate. Economic Insights considers its estimated output weights represent the best point estimate of the true output weight.¹⁷⁴

HoustonKemp considered the output weights were uncertain and have wide confidence intervals. To demonstrate this HoustonKemp translated the standard error from each output coefficient into implied standard errors for our output weights. Houston Kemp then demonstrated that these output weights had wide confidence

¹⁷¹ Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian Electricity TNSPs*, 10 November 2014, p. 5.

¹⁷² HoustonKemp, *Review of the AER transmission network benchmarking study & its application to setting TransGrid's opex rate of change*, January 2015 and TransGrid, *Revised revenue proposal*, January 2015, p. 91.

¹⁷³ Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015.

¹⁷⁴ Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 1.

intervals so our output weights were uncertain.¹⁷⁵ HoustonKemp also showed that under different assumptions, such as excluding AusNet Services' data, that the output weights changed.¹⁷⁶ However, HoustonKemp noted that this analysis did not challenge Economic Insights' assumptions but only that the results were uncertain and the strength of assumptions in our analysis that we can rely upon are uncertain.¹⁷⁷

Economic Insights noted that HoustonKemp adopted a 'crude' method to derive the standard errors and that the standard error for the output share would be much more complex and take into account the standard errors of other output coefficients.¹⁷⁸

Economic Insights considered that its estimate of the output weights is the best estimate available and estimation uncertainties are due to the small sample size of 40 observations for our transmission industry data.¹⁷⁹

Economic Insights also noted it expected that further reducing the sample size by excluding years and/or businesses would produce volatile results that we cannot rely on as HoustonKemp's analysis shows. Therefore, Economic Insights saw no reason to change its analysis.¹⁸⁰

Alternative specification

We consider Economic Insights model specification produces the best estimate of the output weights. HoustonKemp's analysis does not show that their model is superior to Economic Insights' model nor does it show that these alternative models produce a significantly different forecast output growth.

HoustonKemp considered that there is no objective means of assessing the appropriateness of any different input/output specification, so alternative specifications are equally valid. HoustonKemp then noted that alternative models lead to different relative productivity results and output specifications.¹⁸¹

We disagree that alternative specifications are equally valid. We consider that the output specification developed by Economic Insights is the most appropriate. Economic Insights developed the output specification through a consultative approach.

¹⁷⁵ HoustonKemp, *Review of the AER transmission network benchmarking study & its application to setting TransGrid's opex rate of change*, January 2015, p. 10.

¹⁷⁶ HoustonKemp, *Review of the AER transmission network benchmarking study & its application to setting TransGrid's opex rate of change*, January 2015, p. 11.

¹⁷⁷ HoustonKemp, *Review of the AER transmission network benchmarking study & its application to setting TransGrid's opex rate of change*, January 2015, p. 10.

¹⁷⁸ Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, pp. 1–2.

¹⁷⁹ Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 1.

¹⁸⁰ Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 2.

¹⁸¹ HoustonKemp, *Review of the AER transmission network benchmarking study & its application to setting TransGrid's opex rate of change*, January 2015, p. 14.

Economic Insights included a short list of potential outputs and discussed the reasoning for these outputs in its report to our Guidelines.¹⁸²

Economic Insights then tested and consulted on this shortlist of outputs to develop the following output specification for the first annual benchmarking report:

- energy delivered
- ratcheted maximum demand
- weighted entry and exit connections
- circuit length
- energy not supplied as a measure of reliability.¹⁸³

Economic Insights noted that this specification captured the key dimensions of TNSP functional output; it included reliability, demand side as well as supply side dimensions of system capacity and did not appear to favour one type of TNSP at the expense of another.¹⁸⁴

Due to this extensive testing Economic Insights does not agree that alternative models are equally valid.¹⁸⁵ Economic Insights tested various output specifications in consultation with stakeholders to arrive at its preferred output specification.¹⁸⁶ Economic Insights also noted that one of HoustonKemp's models produced negative output weights for energy which is an illogical result.¹⁸⁷

Further, HoustonKemp included system capacity in one of its alternative models. Economic Insights raised several issues regarding the use of system capacity as an output. In particular system capacity artificially advantages large TNSPs related to small TNSPs due to the multiplicative nature of the measure.¹⁸⁸

We do not consider HoustonKemp's sensitivity analysis produce models that are equally robust to Economic Insight's output specification. HoustonKemp's process of including or excluding various outputs to produce an output specification ignores the logic and process Economic Insights undertook to arrive at its output specification.

HoustonKemp's analysis, which showed that the relative MTFP rankings of the transmission businesses changed with each model, is not relevant to the rate of

¹⁸² Economic Insights, *Economic benchmarking of network service providers*, 25 June 2013, pp. 33–46.

¹⁸³ Economic Insights, *TNSP MTFP results*, 31 July 2014, p. 4.

¹⁸⁴ Economic Insights, *TNSP MTFP results*, 31 July 2014, p. 4.

¹⁸⁵ Economic Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 3.

¹⁸⁶ Economic Insights Better regulation workshop note, guidelines report and Economic Insights, *TNSP MTFP results*, 31 July 2014.

¹⁸⁷ Economic Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 3.

¹⁸⁸ Economic Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 3.

change. What is important for the rate of change is the slope,¹⁸⁹ and the slopes remained largely the same for each specification.¹⁹⁰

Opex PFP

We do not consider HoustonKemp and TransGrid's analysis shows that our opex PFP is not robust. Rather, opex PFP is sensitive to changes to the already small sample size.

HoustonKemp and TransGrid identified that the opex PFP was sensitive to the time period chosen. Its analysis showed that the opex PFP trend varied between –2.47 per cent and 1.19 per cent. They also showed that the inclusion of 2013–14 data results in a negative opex PFP.¹⁹¹

We note the –2.47 per cent productivity for 2005–06 to 2008–09 is due to abnormal events that occurred within AusNet Services transmission network in 2008–09. In that year an explosive failure occurred at AusNet Services' South Morang terminal station in addition to a conductor drop on the Bendigo to Ballarat line. These events had a significant negative impact on AusNet Services' reliability performance for that year. Reliability is one of our output measures and any significant decrease in reliability also decreases the opex PFP.

We consider HoustonKemp's estimate of the decrease in productivity from 2006–14 included assumptions from TransGrid that result in a fall in AusNet Services' productivity. Economic Insights considered forecast opex PFP should use a balanced panel of actual data and HoustonKemp's estimated 2014 productivity should not be used.¹⁹²

Economic Insights further noted that productivity is stable across alternative specifications and we have been conservative by adopting an output specification that results in lower productivity.¹⁹³ We have also been conservative by not excluding the effect of historical step changes which also decreased productivity.¹⁹⁴ We consider a conservative approach is appropriate in the circumstances because it:

- recognises the reasonable opportunity to recover efficient costs¹⁹⁵

¹⁸⁹ The slope does not measure the absolute value of a data series but rather how this data series has moved through time.

¹⁹⁰ Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 3.

¹⁹¹ TransGrid, *Revised revenue proposal*, January 2015, p. 91.

¹⁹² Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 4.

¹⁹³ Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 4.

¹⁹⁴ Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 4.

¹⁹⁵ NEL section 7A (2).

- allows for a return commensurate with the regulatory and commercial risks involved in providing its services.¹⁹⁶

We discuss the impact of these two factors in our productivity section below. Further, TransGrid's assumptions drive HoustonKemp's estimates of the opex PFP for 2014 rather than reported data.

C.4.3 Output growth

We have not adopted the forecast output growth in TransGrid's revised revenue proposal.

We noted in our draft decision that we did not consider a change in the value of capital inputs would result in a change in opex. We also noted that TransGrid may have linked its land and easements growth to an increase in residential and rural property prices. We do not consider price growth should influence output growth.¹⁹⁷

We also note in section C.4.1 that we do not consider TransGrid's forecast network growth is a reasonable methodology to forecast output growth. This is because it indirectly measures the change in outputs through the change in capex and it does not reflect the actual change in that input.

For the reasons set out in sections C.4.1 and C.4.2 we consider our approach, based on the weighted average change in TransGrid's actual outputs, better reflects the change in opex due to output growth than does TransGrid's capex based method.

However, TransGrid did not address the concerns we raised about their approach to forecasting output growth in our draft decision. Rather, it considered:

- output growth measures and weights from our MTFP analysis are not suitable for determining forecast output growth
- our output specification does not reflect the outputs in the NER
- depending on the timing of the investment cycle, an increase in outputs may require significant investment in additional assets and a higher increase in expenditure.¹⁹⁸

Sensitivity of output weights

We discuss TransGrid's criticisms of our economic benchmarking analysis in C.4.2. We consider our output specification and output weights are robust. We also consider our MTFP analysis addresses the concerns we have about TransGrid's approach.

¹⁹⁶ NEL section 7A (5).

¹⁹⁷ AER, *Draft decision TransGrid transmission determination 2015–16 to 2017–18 Attachment 7: operating expenditure*, November 2014, p. 110.

¹⁹⁸ TransGrid, *Revised revenue proposal*, January 2015, p. 90.

We also note our output growth is robust to HoustonKemp's alternative model specifications. Table C.3 shows the average annual output growth under each of HoustonKemp's sensitivity analysis scenarios.

Table C.3 Output growth under different output weights (per cent)

	Average forecast 2014–18 output growth
AER	0.62
Exclusion of AusNet services	0.82
Exclusion of 2013 data	0.76
Demand sensitivity	0.63
TransGrid proposed	1.75

Source: AER analysis.

As shown in Table C.3 the average annual output growth using the weights from HoustonKemp's alternative models results in an output growth that is lower than TransGrid's. It also shows that output growth is not sensitive to different output specifications and output weights.¹⁹⁹ So even though HoustonKemp demonstrated that the output weights may change under different output specifications. The overall effect of the alternative output specifications on output growth is not material.

Output specification

We consider our output specification captures all the changes in outputs relevant to output growth component of the rate of change. We consider TransGrid's criticisms of our output specification are not relevant to the rate of change because:

- they only affect cross sectional comparisons of TNSPs and the rate of change only forecasts changes in a TNSP's outputs over time
- the NER require the TNSP to maintain these outputs so it should not change over the forecast period
- they have already been considered in our step change assessment.

TransGrid noted that our output specification did not include the following outputs set out in the NER:

- compliance with applicable regulatory obligations
- quality of supply

¹⁹⁹ We note that any changes in the output weights and output specification will also result in a change to productivity. So we cannot consider changes to output growth in isolation.

- security and safety of the transmission system.²⁰⁰

We do not consider the outputs, listed above by TransGrid, are required in the output growth component of the rate of change. We note changes in regulatory obligations are captured in our step change assessment. The NER requires TNSPs to comply with applicable regulatory obligations and in the absence of an obligation that relates to quality or security, to maintain quality and security. The NER requires a TNSP to maintain the safety of the system. Since output growth aims to measure changes in the quantity of outputs over time, not the absolute level of outputs at a point in time, these objectives are not relevant to the rate of change.

TransGrid also raised concerns regarding the consistency of voltage-weighted entry and exit connections output. TransGrid noted there are differences in the way transmission service providers defined it.²⁰¹

We consider this is not an issue that affects our forecast of output growth. Even if different businesses interpreted this output differently, each service provider reported it consistently through time. Any differences across service providers could impact cross sectional comparisons but is not relevant for comparisons through time.

Similarly TransGrid stated that we had not adequately taken into account other exogenous factors that distinguish TNSPs in our benchmarking.²⁰² Economic Insights considered that the rate of change is unlikely to be affected by operating environment factors. This is because operating environment factors are relatively constant over time and affect productivity level comparisons more than productivity growth rate comparisons.²⁰³

TransGrid also notes the MTFP output specification includes energy throughput, which service providers have no obligation for under the NER.²⁰⁴

Economic Insights explains that energy throughput is commonly used in the literature of benchmarking electricity service providers and is a relevant service provided to customers.²⁰⁵ We consider it is an appropriate output to include in the output specification.

²⁰⁰ TransGrid, *Revised revenue proposal*, January 2015, p. 24.

²⁰¹ TransGrid, *Revised revenue proposal*, January 2015, p. 29.

²⁰² TransGrid, *Revised revenue proposal*, January 2015, p. 28.

²⁰³ Economic Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 5.

²⁰⁴ TransGrid, *Revised revenue proposal*, January 2015, p. 26.

²⁰⁵ Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and Tasmanian Electricity TNSPs*, November 2014, pp. 9–10.

Investment cycle

For the investment cycle, TransGrid noted that increases in outputs may require significant investment in excess of the proportional change in output.²⁰⁶ However, we consider TransGrid's network growth should reflect the change in the quantity of the assets to maintain rather than the increase in capex.

We acknowledge that an increase in network size may require more opex to maintain the network. To measure this increase we have linked it to the change in outputs. In contrast, TransGrid's methodology links the change in network size to its capex.

TransGrid noted that its proposed output growth is modest to reflect the expected minimal growth in its network.²⁰⁷ Table C.4 shows TransGrid's proposed output growth drivers compared to our output growth drivers.

Table C.4 Output growth drivers (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid				
Lines	3.29	2.18	–	–
Substations	3.80	2.67	0.59	0.20
Communications	8.86	2.17	5.06	0.06
Secondary Systems	2.89	1.37	2.74	–0.04
Land and Easements	4.31	4.63	6.89	1.09
AER				
Energy	1.06	0.15	0.90	1.03
Ratcheted maximum demand	–	–	–	–
Weighted connection points	2.40	1.52	0.03	1.83
Circuit length	1.46	–	–	–0.73

Source: TransGrid opex model revised proposal and AER analysis.

As discussed in section C.4.1, we consider TransGrid's forecast network growth is a function of its forecast capex, which is affected by price and value changes. TransGrid expects minimal growth in its network over the forecast period.²⁰⁸ Since TransGrid's estimated network growth increases at a greater rate than the equivalent outputs reported in its reset RIN, this indicates that TransGrid's measure is capturing more

²⁰⁶ TransGrid, *Revised revenue proposal*, January 2015, p. 90.

²⁰⁷ TransGrid, *Revised revenue proposal*, January 2015, p. 90.

²⁰⁸ TransGrid, *Revised revenue proposal*, January 2015, p. 90.

than just the change in the quantity of outputs. This supports our view that TransGrid's indirect measure of network growth does not only capture the change in the quantity of outputs but other factors too, such as price and value changes.

We also consider TransGrid has not provided evidence to show that the link between its growth related capex and opex is reasonable. As shown in Table C.1 TransGrid's network growth for lines increases in 2014–15 and 2015–16 however TransGrid reported an increase in line length for 2014–15 only. As discussed in section C.4.1 TransGrid proposed to decommission a 132 kV transmission line however TransGrid's network growth formula did not reflect this. This demonstrates the bias towards opex increases in TransGrid's approach to accounting for output growth.

Overall we consider our approach to forecasting output growth does not share these concerns because it directly identifies the change in outputs and the subsequent change in opex required to service the change in outputs. TransGrid's method assumes a relationship between growth related capex, the replacement value of its network and opex. This is an indirect relationship influenced by non-output related factors such as price growth and does not take into account the actual change in the quantity of services provided to customers.

C.4.4 Productivity growth

We have adopted our alternative forecast of productivity growth using opex PFP. Our method of accounting for productivity growth overcomes the concerns we have identified with TransGrid's approach. We also note that we have adopted the lowest forecast productivity growth from our alternative model specifications and we have not adjusted historical productivity growth for step changes which would have further increased productivity growth.

TransGrid accounted for forecast productivity growth by incorporating economies of scale to its network growth and including negative step changes. We accepted a similar approach in TransGrid's previous determination.

In the sections below we discuss:

- why we have adopted an alternative productivity forecast
- the impact of productivity growth on the rate of change
- the impact of step changes
- other submissions.

Our alternative forecast of productivity growth

We have adopted an alternative method to forecast TransGrid's productivity growth. We consider this approach addresses our criticisms with TransGrid's method. In section C.4.1 we discuss why we consider TransGrid's approach to forecasting productivity growth using economies of scale and negative step changes is not reasonable.

We noted TransGrid's network growth influences its economies of scale and we did not consider TransGrid's network growth methodology is reasonable. Further, TransGrid's productivity forecast does not consider other sources of productivity such as technical change.

TransGrid did not adopt our approach in its revised proposal. It considered opex PFP was sensitive to changes in sample size. We discuss in section C.4.2 why we consider TransGrid's opex PFP sensitivity analysis was flawed. We note the sensitivity around HoustonKemp's opex PFP analysis is due to it selecting an outlier in 2008–09 and using estimated data for 2013–14.

Our approach is consistent with our Guideline method to assessing productivity growth. In our Guidelines we recognised the limitations of applying only economies of scale without incorporating other sources of productivity such as technical change. We noted that we had only applied economies of scale in the past and did not include other sources of productivity such as labour productivity due to the risk of double counting. We noted our intention to develop a single productivity forecast through econometric modelling.²⁰⁹

Economic Insights noted that there were insufficient observations available to reliably use econometric models. Instead Economic Insights recommended the use of opex PFP to measure historical productivity. Economic Insights noted the following advantages of using opex PFP:

- index numbers are simple and robust
- it can be implemented when there are only a small number of observations
- the results are readily reproducible
- it has a rigorous grounding in economic theory²¹⁰

We consider opex PFP is a better approach because it measures actual productivity growth rather than relying on assumptions on the link between capex, economies of scale and opex.

We have maintained our draft decision approach of applying the average industry productivity of 0.86 per cent from 2006–13 to forecast productivity.

Impact of productivity growth

We have adopted the measured historical productivity from Economic Insights' preferred model using a five output specification. This measure produces the lowest productivity forecast from Economic Insights' sensitivity analysis.²¹¹

²⁰⁹ AER, *Explanatory statement draft expenditure forecast assessment guidelines for electricity transmission and distribution*, August 2013, p. 36.

²¹⁰ Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 10 November 2014, p. 5.

We compare TransGrid's proposed productivity growth and our own forecast in Table C.5.

Table C.5 Forecast productivity growth (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid				
Economies of scale	1.64	1.19	0.45	0.12
Step decreases	0.75	1.11	0.00	0.00
Total	2.39	2.30	0.45	0.12
AER				
Opex PFP	0.86	0.86	0.86	0.86

Source: TransGrid opex model and AER analysis.

We note that TransGrid's productivity is higher than ours in 2014–15 and 2015–16 due to higher economies of scale to offset TransGrid's output growth and negative step changes. Productivity in 2016–17 and 2017–18 is lower due to lower output growth and no negative step changes.

TransGrid considered our opex PFP was not robust or able to provide a good measure of efficiency because it is sensitive to changes in the model specification or source data.²¹²

We discuss in section C.4.2 why we consider our MTFP and opex PFP analysis is robust. Since our analysis of observed productivity from 2006–13 is robust, we consider opex PFP is a reasonable approach to forecasting productivity.

We noted in our draft decision that Economic Insights performed sensitivity analysis against alternative output specifications.²¹³ Table C.6 shows the opex PFP under different output specifications.

Table C.6 Opex PFP using alternative output specifications*

Outputs included	2006	2007	2008	2009	2010	2011	2012	2013	Annual growth
5 outputs	1.000	1.004	1.026	0.925	0.986	1.041	1.013	1.062	0.86%
4 outputs	1.000	1.010	1.032	0.938	1.002	1.058	1.034	1.082	1.12%

²¹¹ Both output growth and productivity growth should use the same model specification so if we were to adopt an alternative specification this would affect the output growth component of the rate of change as well.

²¹² TransGrid, *Revised revenue proposal*, January 2015, p. 91.

²¹³ AER, *Draft decision TransGrid transmission determination 2015–16 to 2017–18 Attachment 7: operating expenditure*, November 2014, p. 114.

Outputs included	2006	2007	2008	2009	2010	2011	2012	2013	Annual growth
3 outputs	1.000	1.007	1.033	0.947	1.019	1.085	1.072	1.132	1.77%

Source: Economic Insights TNSP report p. 16.

* 5 outputs include energy, ratcheted maximum demand, weighted entry and exit connections, line length and energy not supplied. 4 outputs include energy, ratcheted maximum demand, weighted entry and exit connections and energy not supplied. 3 outputs include ratcheted maximum demand, weighted entry and exit connections and energy not supplied.

We note all three output specifications measure a positive opex PFP and the five output specification produces the lowest opex PFP compared to the four and three output specifications.

Under our rate of change approach, we cannot assess economies of scale without considering its relationship with output growth. As discussed in section C.4.3, TransGrid forecast higher output growth than we do. TransGrid's output growth, after including economies of scale, is higher than our output growth before any productivity adjustment. In other words, TransGrid's productivity growth forecast is higher than ours due to its higher output growth forecast.

C.4.5 Step changes

We consider step changes affect our historical measure of productivity. However, because we do not consider the historical data on step changes is robust we have not amended our approach to include the impact of step changes.

We have also amended our step change assessment to include approved step changes rather than incorporating these step changes in the productivity component of the rate of change.

This results in a lower productivity forecast for TransGrid than would be the case if we had adjusted productivity to include step changes.

In the sections below we discuss why:

- we have not amended our productivity to take into account historical step changes
- we have not included negative step changes in our alternative forecast

Accounting for step changes in opex PFP

We have not amended our productivity forecast to take into account historical step changes. We have also amended our step change assessment to include an adjustment for approved step changes (see section B.3.1).

HoustonKemp stated that our forecast ignored step changes in opex, even though it submits that expenditure is justified. Further, HoustonKemp considered our approach assumed that historical step changes are a sensible proxy for future step changes.²¹⁴

We do not consider our approach was based on using past step changes to proxy future step changes. We noted in our draft decision that if we were to account for step changes in opex PFP, it would increase opex PFP from 0.86 per cent to 1.29 per cent. We further noted that the difference between applying an opex PFP of 1.29 per cent and 0.86 per cent would result in a \$7.5 million reduction in TransGrid's opex over 2014–18. So rather than applying a higher forecast opex PFP of 1.29 per cent, we considered a 0.86 per cent forecast for opex PFP to be reasonable if we did not also include \$2.8 million in approved step changes.

Economic Insights considered we should apply the opex PFP of 0.86 per cent because previous transmission determinations did not explicitly include step changes. This approach would underestimate the true underlying opex PFP growth rate and compensate the service provider for some degree of future step increase.²¹⁵

We consider this an appropriate approach because step changes typically result in an increase in opex without an increase in outputs. However, we recognise that current data for step changes in past transmission determinations are not likely to be robust.

For this reason we have amended our approach to step changes in this final decision from that taken in our draft decision. Where previously, we did not include approved step changes in the opex allowance to account for applying a lower productivity forecast, we do so for our final decision. We discuss this further in section B.3.1 of our step change appendix.

Negative step changes

We have not included an explicit adjustment for negative step changes in our productivity forecast because we consider our overall forecast already includes all sources of productivity.

We discuss our criticisms of TransGrid's negative step changes in C.4.1.

We consider using negative step changes to forecast productivity is a bottom-up methodology. We do not consider TransGrid's methodology captures all sources of productivity such as technical change.

Our forecast productivity is a single overall measure of productivity which includes all sources of productivity. If we were to also include TransGrid's negative step changes

²¹⁴ HoustonKemp, *Review of the AER transmission network benchmarking study & its application to setting TransGrid's opex rate of change*, January 2015, p. 22

²¹⁵ Economics Insights, *Memorandum: HoustonKemp review of TNSP economic benchmarking report*, 4 March 2015, p. 4.

this would double count the productivity gains associated with those negative step changes.

We consider using the average industry productivity from 2006–13 reflects the forecast productivity an efficient transmission service provider would be expected to achieve. As noted in our draft decision our forecast productivity assumes a business as usual scenario and there will be no significant structural change in the electricity transmission industry for the 2014–18 period relative to 2006–13.²¹⁶

Other submissions

The EMRF supported our approach to forecasting productivity. It considered TransGrid's approach was not robust and depended on the assumptions made.²¹⁷

The CCP submitted that other asset intensive industry sectors delivered productivity improvements over recent years. It considered there is no justification for the electricity transmission sector to have lower productivity growth than those sectors.²¹⁸

We note the CCP has not identified which other industries delivered productivity improvements in excess of the transmission industry. These other industries may have experienced exogenous factors that are not applicable to the transmission industry.

We have assumed that past industry performance is a good indicator of future performance absent any structural shifts in the transmission industry. We consider this to be the case because opex is relatively recurrent and TransGrid should be able to achieve the industry average which we consider to be the benchmark.

C.4.6 Price growth

TransGrid accepted our draft decision method and updated labour price growth to reflect its consultant BIS Shrapnel's latest forecasts.

We accept this approach and have also updated the forecasts to reflect our consultant Deloitte Access Economics' latest forecasts.

Table C.7 2014–18 Price growth (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid	0.52	0.83	0.92	1.17
AER	0.43	0.39	0.57	0.78

²¹⁶ AER, *Draft decision TransGrid transmission determination 2015–16 to 2017–18 Attachment 7: operating expenditure*, November 2014, p. 112.

²¹⁷ Energy markets reform forum, *NSW electricity transmission revenue reset AER draft decision and TransGrid revised proposal*, January 2015, pp. 42–43.

²¹⁸ Consumer challenge panel, *AER draft TransGrid determination TransGrid revised revenue proposal*, 6 February 2015, p. 44.

	2014–15	2015–16	2016–17	2017–18
Difference	-0.09	-0.45	-0.36	-0.39

Source: AER analysis

We note the difference between TransGrid's revised price growth and our price growth is due to updated DAE forecasts and TransGrid's category specific forecast of insurance.

We do not consider TransGrid's category specific forecasts are reasonable. We discuss why TransGrid's approach is not likely to lead to a forecast that reasonably reflects the opex criteria in our assessment of TransGrid's forecasting method (see Appendix A).

The CCP noted that we must ensure that NSW networks are not allowed to continue with their approach of treating enterprise bargaining agreements (EBA) outcomes as a 'pass through' and we need to apply a labour price forecast specific to the electricity network sector.²¹⁹

We note TransGrid revised its labour price growth to adopt the methodology set out in our draft decision. We agree with the CCP that EBA outcomes for the particular service provider should not be a sole determinant of labour price growth and for this reason we did not apply TransGrid's EBA outcomes in our draft decision.

The CCP also noted that TransGrid's non-labour inputs are trending downwards and the application of CPI is likely to significantly over estimate TransGrid's input costs.

We note we base our non-labour price growth on producer price indices (PPI's) rather than commodities prices. Based on Economic Insights' analysis, the PPI's matched closely to the CPI.²²⁰ We do not consider materials prices to be a significant component of opex and as discussed above we have not included other price growth categories that do not have a significant impact on opex.

²¹⁹ Consumer challenge panel, *AER draft TransGrid determination TransGrid revised revenue proposal*, 6 February 2015, p. 42.

²²⁰ Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 10 November 2014, p. 10.