Draft decision

TransGrid transmission determination

2015–16 to 2017–18

Attachment 7: Operating expenditure

November 2014

AUSTRALIAN ENERGY REGULATOR

Inquiries about this document 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 draft decision on TransGrid's revenue proposal 2015–18. It should be read with other parts of the draft decision.

The draft 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

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	aggregate 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
NTSC	negotiated transmission service criteria

Shortened form	Extended form
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 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 Draft 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 outlined in Table 7-1.

Table 7-1 Our draft decision on total opex ($million 2013–14)

	2014–15	2015–16	2016–17	2017–18	Total
TranGrid'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
Difference	-17.4	-27.7	-34.1	-28.3	-107.5

Source: TransGrid, Regulatory Proposal, PTRM; AER analysis.
Note: Excludes debt raising costs and has been expressed in year end terms.

7.2 TransGrid's proposal

TransGrid proposed a forecast opex of $754.6 million (real 2013–14) for the 2014–18 period. The average annual proposed opex is $23.5 million (or 14.2 per cent) higher than the average annual actual opex over the 2009–14 period.

Table 7-2 shows the increase between TransGrid's forecast opex (2014–18) and its historical opex (2009–14). 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 comes mostly from increases in corporate and regulatory management expenditure and step change costs.[2] The increase in corporate and regulatory management expenditure is due to a forecast increase in employee entitlements such as defined benefits superannuation and long service leave.

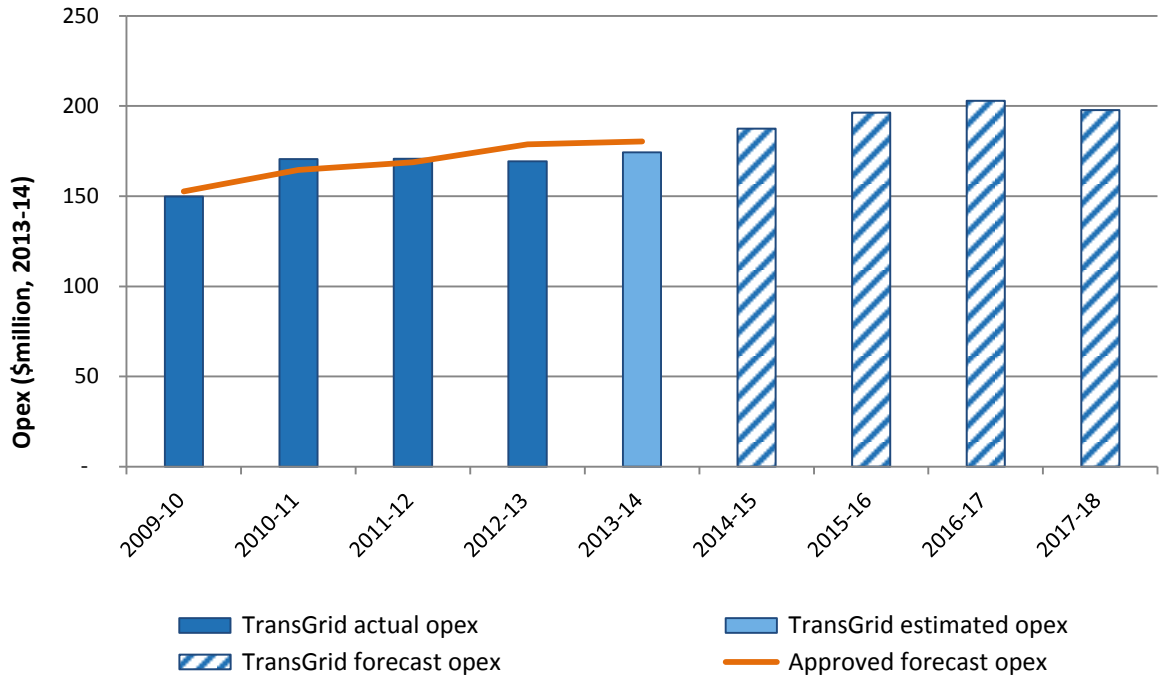
Table 7-2 TransGrid's proposed opex increases ($ million, 2013–14)

Total opex 2009–14 (five years)	Total opex 2014–18 (four years)	Average annual increase ($m)	Average annual percentage increase (%)
834.8	754.6	23.5	14.2

Source: TransGrid, Regulatory Proposal, PTRM
Note opex for 2009–14 includes estimated opex for 2013–14. We calculated average annual increase and average annual percentage increase excluding the estimate for 2013–14.

1 NER, cl. 6A.6.6(c).
2 TransGrid, *Revenue proposal*, May 2014, pp. 118, 156.

Figure 7-1 TransGrid's actual/estimated and proposed opex, 2009-10 to 2017-18 ($ million, 2013–14)



Source: TransGrid, *Regulatory Proposal*, May 2014, RIN; AER analysis.

7.3 Assessment approach

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.

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

---

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.
6 NER, cl. 6A.6.6(a).

(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 maintain 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:

- 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;

---

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 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 Rules, 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 section.

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]

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 (our 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]

---

11 NEL, s. 16(2); s. 7A.
12 AER, *Expenditure forecasting assessment guideline - explanatory statement*, November 2013
13 NER, cl. 6A.5.6.

We may depart from the approach set out in our Guideline but if we do so we have to give reasons for doing so. In this determination 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 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.

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:

1. We typically use the service provider's actual opex in a single year as the starting point for our assessment. While categories of opex can vary from year to year, total opex is relatively recurrent.

2. We assess whether opex in that base year reasonably reflects the opex criteria. We now have a number of different techniques by which can test the efficiency of opex in the base year. If necessary, we make an adjustment to the base year expenditure to ensure that it reflects the opex criteria. We can utilise the same techniques available to assess the efficiency of base year opex to make an adjustment to base year opex.

3. As the opex of an efficient service provider tends to change over time due to price changes, output and productivity, we trend the adjusted base year expenditure forward over the regulatory control period to take account of those changes. We refer to this as the rate of change.

---

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.
16 NER, clause 6A.6.6(c).
17 NER, clause 6A.14.2.

4. We then adjust the base year expenditure to account for any other forecast cost changes over the forthcoming regulatory control period that would meet the opex criteria. This may be due to new regulatory obligations and efficient capex/opex trade-offs. We call these step changes.

5. Finally we add any additional opex components which have not been forecast using this approach. For instance, we forecast debt raising costs based on the costs incurred by a benchmark efficient service provider. If we removed a category of opex from the selected base year, we will need to consider what additional opex is needed for this category in forecasting total opex.

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 expenditure 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 expenditure 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 the benchmark efficient costs of providing 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 2014–19 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 these reductions 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 service 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.'

To assess the efficiency of the base year, we have regard to the results of our economic benchmarking techniques which compare the efficiency of a service provider's use of inputs to produce outputs. From this, we can compare the productivity of a service provider over time, and to other service providers. For this decision we have used Multilateral Total Factor Productivity modelling, and partial productivity indicators.

We also have regard to trends in total level opex. We have also 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 forecast opex. Rather, we will

---

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.

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 an efficient starting point, we apply an annual escalator to take account of the likely ongoing changes to efficient opex over the forecast period. Efficient opex in the forecast regulatory control period could reasonably differ from the efficient starting point due to changes in:

- prices
- outputs
- productivity.

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

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 compensate a service provider for step changes only 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 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 apparent 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]

---

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

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

> … 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. We would expect a service provider (including its shareholders) to wear the cost of any inefficiency. To do otherwise, would mean electricity network consumers would fund some costs of a service provider's inefficiency. 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 appears to be reflected in the National Electricity Rules (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 demand and cost inputs to achieve the expenditure objectives.[22]

7.4 Reasons for draft decision

We are not satisfied that TransGrid's total forecast opex reasonably reflects the opex criteria. We reached this conclusion after undertaking our analysis our guideline opex forecasting approach. When we compare TransGrid's total forecast opex with our estimate of the efficient opex a prudent operator would require to achieve the opex objectives, its proposal is materially higher such that it does not reasonably reflect the opex criteria. For this reason, we have substituted TransGrid's total opex forecast with our total opex forecast.

The key areas of difference are that in our alternative estimate of forecast total opex we did not accept 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 $22.2 million (2013–14) of the difference between TransGrid's proposed opex and our estimate.

2. base year opex—while we do not conclude that TransGrid's proposed 2012-13 base year is inefficient, we did not include a number of TransGrid's proposed adjustments.

3. rate of change—TransGrid proposed an output change based on a function of its capex and productivity based on step decreases in opex. This results in a higher output change and lower productivity than what we estimate, based on index number based approach using economic benchmarking data. The difference in rate of change accounts for $11.6 million of the difference between TransGrid's proposed opex and our estimate.

4. step changes—TransGrid proposed a number of step changes which we consider to be business as usual costs rather than costs associated with changes in regulatory obligations. It did not

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

adequately justify other proposed step changes or we did not consider its proposed expenditure to be prudent and efficient. We have included step changes of –$6.4 million over the 2014–18 period, compared to the $40.9 million proposed by TransGrid.

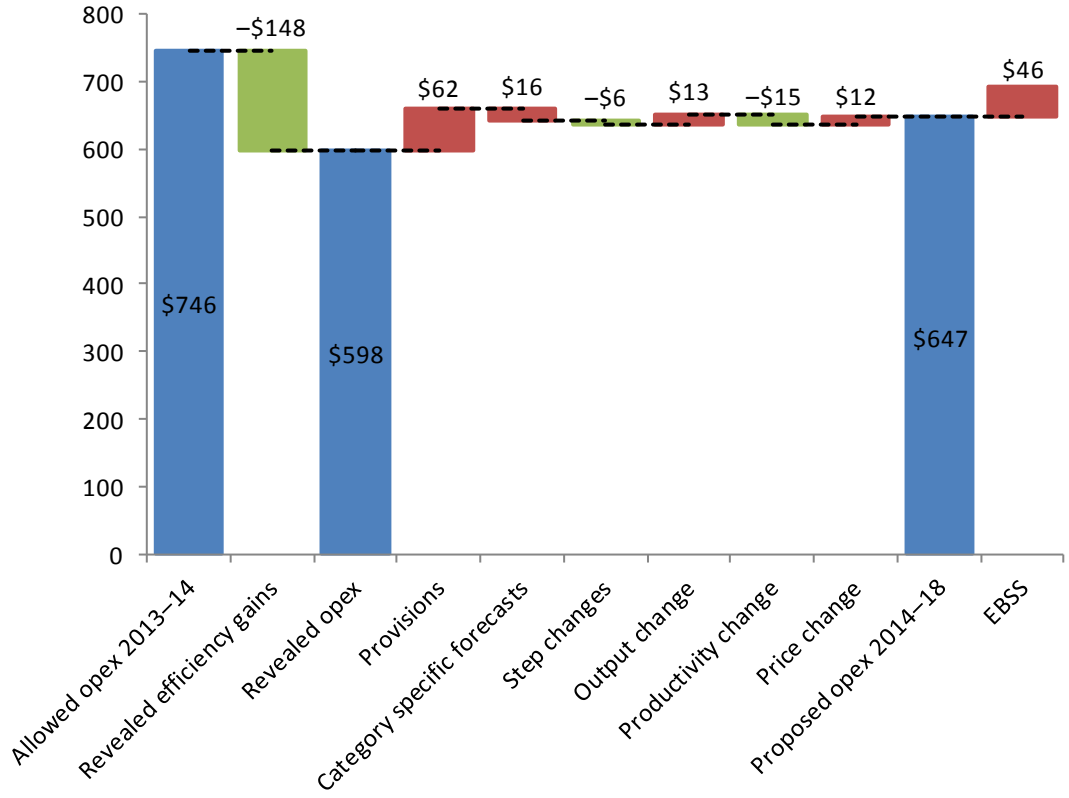
However, in calculating our productivity forecast it is possible to either use historical opex data, which includes past step change expenditure, or use historical opex data with the past step change expenditure excluded. Applying the former method results in a lower productivity forecast and no separate step change compensation unless it is greater than the step change amount captured in the productivity forecast. The later method results in a higher productivity forecast and requires separate, additional expenditure for step changes.

For the TransGrid draft decision we have applied the lower productivity forecast and have made no separate provision for step changes. This is because the step change increment already captured in our productivity forecast over the 2014–18 period is $7.5 million, which more than compensates for the $2.8 million of expenditure we assessed as justified for step changes. We included the negative step change for a capex/opex trade-off was –$6.4 million on the basis that it is not a change in overall expenditure, instead it is essentially a transfer of expenditure between opex and capex.

5. network support—TransGrid proposed $26.4 million of pre-emptive procurement of network support over 2014–18. TransGrid stated that this was to build the market in case network support could be used as an alternative to capex (the contingent project, 'Powering Sydney's Future'). We do not consider that it is necessary to procure network support pre-emptively. We are not including the contingent project in our alternative capex estimate. This is due to Ausgrid revising down its peak demand forecasts, which defers the requirement for the 'Powering Sydney's Future' capex to beyond the 2014–18 regulatory period.

Figure 7-2 illustrates how our forecast has been constructed. The starting point on the left is what TransGrid's opex would have been for the 2014–18 period if it was set based on TransGrid's reported opex in 2012–13.

Figure 7-2 AER draft decision opex forecast



Source: AER analysis

Table 7-3 summarises the quantum of the difference between TransGrid's proposed total forecast opex and our substitute estimate.

Table 7-3 Proposed vs. draft decision total forecast opex ($million 2013–14)

	2014-15	2015-16	2016-17	2017-18	Total
Proposed opex	180.2	188.9	195.4	190.2	754.6
AER draft decision	162.8	161.1	161.2	161.8	647.1
Difference	-17.4	-27.7	-34.1	-28.3	-107.5

Source: TransGrid, Regulatory Proposal, PTRM; AER analysis.
Note: Excludes debt raising costs.

Our reasons for why we are not satisfied that TransGrid's total forecast opex reasonably reflects the opex criteria are set out in more detail below:

- Section 7.4.1 outlines the difference between TransGrid's forecasting method compared with our revealed cost approach.
- Section 7.4.2 outlines the choice of base year used to forecast opex for the regulatory control period.
- Section 7.4.3 outlines our assessment of TransGrid's proposed network support expenditure.
- Section 7.4.4 and appendix A, outlines our assessment of TransGrid's proposed step changes.

- Section 7.4.5 and appendix B outlines our assessment of the rate of change used to forecast opex in the next regulatory period. This includes a discussion of the three elements comprising the rate of change—price, output and productivity changes.
- Section 7.4.6 outlines our assessment of proposed cost of debt.

7.4.1 Forecasting method

We reviewed TransGrid's forecasting method to assess whether it explains why TransGrid's proposed opex forecast is significantly higher than our estimate. We have concluded that TransGrid's opex forecasting method explains $22.2 million (real 2013–14) of the difference between TransGrid's opex forecast and our estimate. The key differences are that TransGrid's method uses:

- bottom up forecasts to forecast expenditure for major operating projects (MOPs) and insurance expenditure ($22.2 million, 2013–14)
- bottom up volume forecasts, which it multiplies by the unit rates revealed in the base year, to forecast maintenance expenditure (–$16.3 million, 2013–14)
- a historic average defect ratio to forecast corrective/condition-based maintenance ($16.3 million, 2013–14).

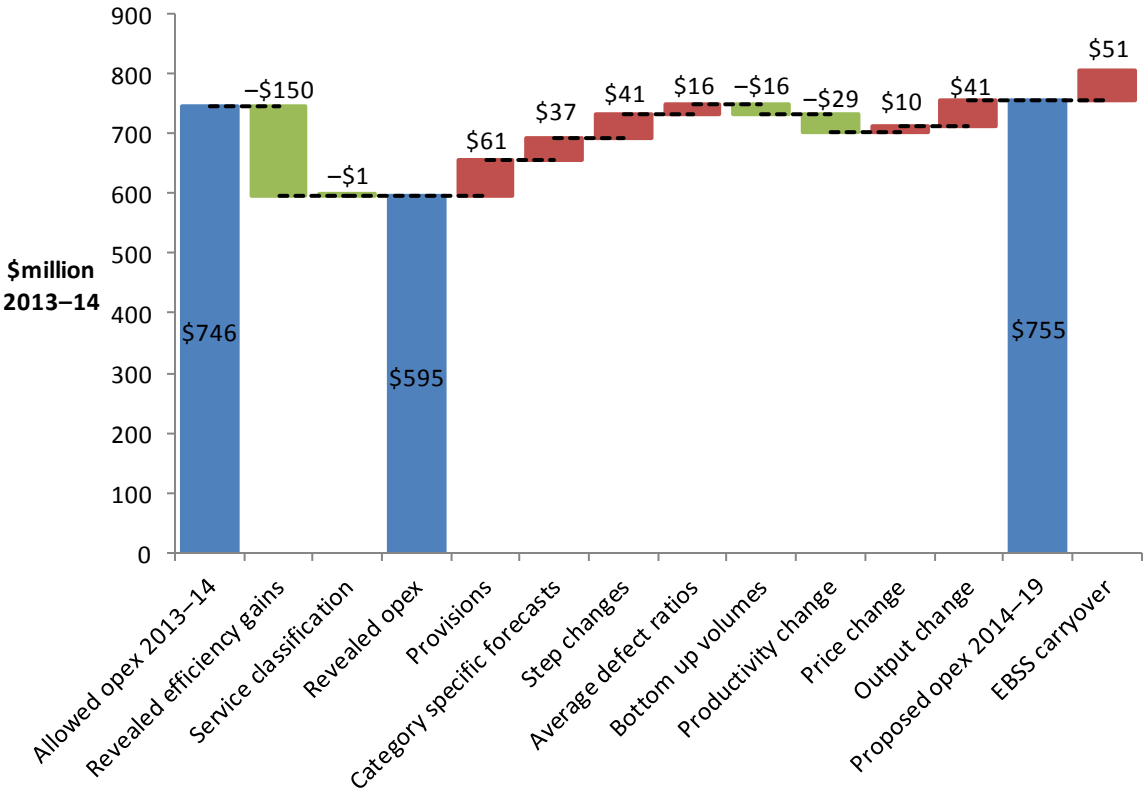
The net impact of TransGrid's forecasting method is that it produces an opex forecast that significantly exceeds our estimate. The reasons for this position are detailed below.

TransGrid's forecasting method

TransGrid describes its opex forecasting method in its revenue proposal.[23] The revenue impacts of the various elements of TransGrid's forecasting method are disaggregated in figure 7-3 below. We show in figure 7-3 the drivers of change between TransGrid's allowed opex in 2013–14 and its proposed opex allowance for the 2014–18 period.

[23] TransGrid, *Revenue proposal*, May 2014, pp. 139–143; TransGrid, *Approach to forecasting*, November 2013, pp. 5–12.

Figure 7-3 Forecasting method impacts, $million, 2013–14



Source: AER analysis.

TransGrid stated its opex model predominantly uses a base step trend approach to forecasting opex. Many aspects of TransGrid's forecasting method are similar to our guideline forecasting approach:

- TransGrid used revealed expenditure in 2012–13 as its base opex. This is consistent with our guideline forecasting approach, which uses a single year of revealed expenditure to forecast opex.[24] This reduced its forecast opex by $150 million (real 2013–14) compared to setting opex for each year of the 2014–19 regulatory control period equal to TransGrid's allowed opex for 2013–14.

- TransGrid removed expenditure from its base opex for prescribed services that will be non-prescribed services following the establishment of metering service agreements. This adjustment reduced TransGrid's opex forecast by $1.3 million (real 2013–14).

- TransGrid treatment of provisions was to remove the provisions set aside in the base year from its reported base year opex. It then added back the forecast cash expense to its forecast opex. This is similar to our guideline forecasting approach, where we stated we would likely assess base year expenditure exclusive of any movements in provisions that occurred in that year.[25] This approach increased TransGrid's opex forecast by $60.6 million (real 2013–14).

- TransGrid made adjustment to its opex forecast at the category level. This is consistent with our guideline forecasting approach, which allows for 'step changes'.[26] These step changes increased

[24] AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013, pp. 22–23.
[25] AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013, p. 22.
[26] AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013, p. 24.

TransGrid's opex forecast by $40.9 million (real 2013–14). We have assessed these proposed adjustments as step changes in appendix A.

- TransGrid applied an asset growth factor to account for forecast output changes. This was intended to reflect the change in the maintenance requirements arising from forecast growth in the size of network and subsequent increases in other activities.[27] The asset growth factor was calculated as a function of the forecast capex resulting in a change to network size and the replacement value of the network.[28] This is similar to our guideline forecasting approach, which includes forecast output change in the forecast rate of change.[29] TransGrid's asset growth factor increased TransGrid's opex forecast by $40.7 million (real 2013–14). We have assessed the impact of TransGrid's proposed asset growth factors in appendix B.

- TransGrid accounted for forecast productivity changes by applying economy of scale factors to reflect the scale efficiencies that can be achieved when maintaining a larger network.[30] It also included bottom up forecasts of productivity improvements including changes to its Sydney accommodation, payroll efficiencies and the closure of the Yass control room. In our guideline forecasting approach, we include forecast productivity change in the forecast rate of change.[31] TransGrid's forecast productivity changes reduced TransGrid's opex forecast by $29.2 million (real 2013–14). We have assessed the impact of these forecast productivity changes in appendix B.

- TransGrid accounted for forecast price changes by applying labour rate escalation.[32] In our guideline forecasting approach, we include forecast price change in the forecast rate of change.[33] TransGrid's application of labour rate escalation increased its opex forecast by $13.6 million (real 2013–14). We have assessed the impact of TransGrid's proposed labour rate escalation in appendix B.

TransGrid's opex forecasting method, however, does not rely on revealed expenditure to forecast all cost categories. It differed from our guideline forecasting approach in that it used:

- bottom up forecasts to forecast expenditure for some expenditure categories such as major operating projects (MOPs) and insurance.

- bottom up volume forecasts, which it multiplied by the unit rates revealed in the base year, to forecast maintenance expenditure

- a historic average defect ratio to forecast corrective maintenance volumes.

We discuss these aspects of TransGrid's opex forecasting method below.

Revealed efficiency gains and the EBSS

TransGrid's opex forecasting method is a variation of our base-step-trend approach outlined in our *expenditure forecast assessment guideline*.[34] Our guideline forecasting approach uses actual expenditure in a single year as the basis for forecasting future expenditure. TransGrid used 2012–13 as the base year. If annual opex was set equal to TransGrid's reported opex for 2012–13, it would

27 TransGrid, *Revenue proposal*, May 2014, p. 138.
28 TransGrid, *Revenue proposal*, May 2014, p. 141.
29 AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013, pp. 22.
30 TransGrid, *Revenue proposal*, May 2014, p. 141.
31 AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013, pp. 22–23.
32 TransGrid, *Revenue proposal*, May 2014, pp. 136–137.
33 AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013, pp. 22–23.
34 AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013, pp. 22–24.

require $735 million (2013–14) over the 2014–19 regulatory control period. This is $150 million lower than if opex for each year of the 2014–19 regulatory control period was set equal to TransGrid's allowed opex for 2013–14.

One of the opex factors we must have regard to when assessing the service providers opex forecasts is whether the opex forecast is consistent with the EBSS.[35] In turn, the EBSS must provide for a fair sharing of efficiency gains and losses between service providers and network users.[36] Network users receive their share of efficiency gains through lower opex forecasts that reflect the efficiencies that the EBSS rewards the service provider for. If forecast opex does not reflect these efficiencies then network users never receive their share of these efficiency gains. Thus, in assessing TransGrid's opex forecast we must consider whether it provides network users their share of efficiency gains made by TransGrid. In this instance TransGrid's opex forecast does pass on at least some of the revealed efficiency gains through the revealed base year opex, which it uses as a basis to forecast some expenditure categories. However, TransGrid's forecast opex is 32 per cent higher than its revealed level of expenditure. We must test this forecast increase in expenditure to ensure network users receive their share of efficiency gains. We do this by reviewing the forecasting method adopted by TransGrid and comparing TransGrid's forecast against our own estimate. This includes assessing the rate of change and step changes proposed by TransGrid. We also consider whether TransGrid has treated movements in provisions consistently in the actual opex amounts used to calculate EBSS carryovers and the base opex used to forecast opex for the 2014–18 period.

Category specific forecasts

TransGrid's forecasting method does not rely on revealed expenditure to forecast the following cost categories:

- major operating projects (MOPs)
- insurance and self insurance premiums
- long service leave and defined benefits superannuation entitlements
- network support costs
- debt raising costs.

Forecast expenditure for these cost categories was directly added to the opex model. TransGrid's forecasting method for debt raising costs is consistent with our standard approach.[37] However, 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 $22.2 million (2013–14), or 3.0 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

---

35 NER cl. 6A.6.6(e)(8).
36 NER cl. 6A.6.5(a).
37 In limited circumstances it may be appropriate to forecast a given opex category separately and add this to the total opex forecast. Debt raising costs is one example of opex costs that might be forecast in this way. We have a standard forecasting approach that sets forecasts equal to the costs incurred by a benchmark firm.

biased opex forecasts inconsistent with the opex criteria. Using a category specific forecasting method for some opex categories may produce better forecasts of expenditure for those categories but this may not produce a better forecast of total opex. This view is consistent with the view expressed by Frontier Economics, which stated:[38]

> We consider that it would be inappropriate for the AER to review each component of controllable opex individually to see whether it conformed to the same pattern as overall controllable opex. Such 'cherry-picking' would likely result in aggregate controllable opex being systematically and inefficiently over-forecast.

Frontier Economics considered our single year revealed expenditure forecasting approach to forecasting total opex is appropriate when three conditions are met:[39]

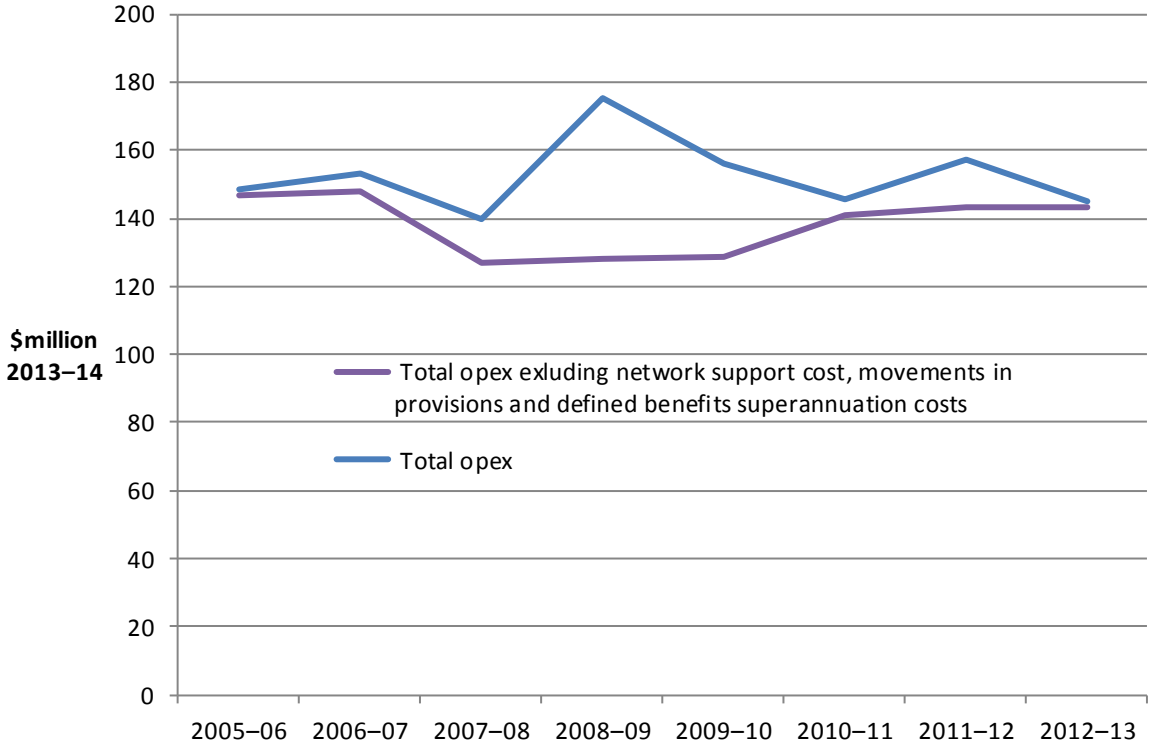
1. the service provider must have incentives to minimise total controllable opex
2. the service provider must have a continuous incentive to minimise opex, or in Frontier Economics' words, they 'must not have an incentive to "game" the regulatory process'
3. opex needs to be broadly recurrent, in that past actual expenditure can provide (with the aid of transparent adjustments) a reasonable reflection of future efficient expenditure.

Frontier Economics stated that if these conditions are met, it is reasonable to apply a single year revealed expenditure forecasting approach and to avoid using category specific forecasts or adjusting the base year. We accept this and are satisfied that the first two conditions hold for TransGrid because our EBSS was applied to it in the 2009–14 regulatory control period, providing it with a continuous incentive to minimise opex to an efficient level.

We have reviewed TransGrid's past opex to see if is broadly recurrent and thus would provide a reasonable reflection of future efficient costs. We found TransGrid's past opex displayed some volatility, which was driven by network support costs as well as movements in provisions and defined benefits superannuation costs. We found total opex was much more stable when these costs were removed. Consequently we have removed these costs from the base opex we used to forecast our substitute forecast using our guideline forecasting approach.

[38] Frontier Economics, *Opex forecasting and EBSS advice for the SP AusNet final decision*, January 2014, p. iii.
[39] Frontier Economics, *Opex forecasting and EBSS advice for the SP AusNet final decision*, January 2014, p. 7.

Figure 7-4 Adjusted total opex, $million, 2013–14



Source: AER analysis

We also note that for network support costs we need to know the network support payments (if any) provided in the annual building block revenue requirement for each year to determine when a network support event has occurred. Consequently we need a separate forecast of network support costs for this reason also.

Having established a broadly recurrent series of adjusted total opex, forecast total opex will systematically exceed the efficient level of opex if a category specific forecasting method is used to forecast opex categories:

- with unusually low expenditure in the base year compared to other years, or
- with a greater rate of change than total opex.

We discuss how these outcomes can arise with reference to our assessment of TransGrid's proposed bottom up forecast for major operating projects, insurance premiums and employee entitlements below.

Major operating projects

TransGrid stated a bottom-up forecasting method should be used to forecast major operating projects (MOPs) expenditure. It stated:

> Major operating projects (MOPS) are forecast using a zero-based portfolio approach. This is the most appropriate forecasting approach, as major operating projects are more similar in nature to capital projects than operating expenditure and tend to be "lumpy" rather than recurrent in nature. An alternative approach, the use of a trend based on historical expenditure, would be less well suited to taking into account the "lumpy" nature of the expenditure and distinct needs that drive it. Accordingly, TransGrid has not used this approach as it may under or over forecast the efficient costs required to meet the operating expenditure objectives.

As outlined in our assessment approach (see section 7.3) we are required to assess whether total opex is consistent with the opex criteria.[40] Within total opex we would expect to see some variation in the composition of expenditure from year to year. That is, expenditure for some categories will be higher than usual in a given year while other categories will be lower than usual. If we apply a revealed expenditure forecasting method at the category level, forecast opex for those categories where expenditure is high in the base year will be higher than the efficient level of expenditure. Conversely, forecast opex will be lower than the efficient level for those categories where expenditure is low in the base year. Consequently, if we use a bottom up forecasting method to forecast those categories where base year opex is low compared to other years, but not for those where base opex is high compared to other years, our forecast of base opex will systematically exceed the efficient level of opex.

TransGrid stated that the MOPs costs category should be forecast separately because it is lumpy in nature. However, for the above reason, the relevant consideration is not whether the cost category is lumpy but whether total opex, including the cost category, is lumpy. We found total opex, including MOPs, to be broadly recurrent once network support costs, movements in provisions and defined benefits superannuation costs were removed (figure 7-4). It was not necessary to remove MOPs to produce a recurrent total opex series.

In assessing TransGrid's opex forecast we must have regard to whether the opex forecast is consistent with the EBSS.[41] Forecasting individual opex categories using a bottom up method is not consistent with the EBSS. Using a bottom up forecasting method to forecast cost categories with low expenditure in the base year does not provide for a fair sharing of non-recurrent efficiency gains made in the base year as required under the NER.[42] When a service provider defers work from the base year and then reinstates the expenditure in the opex forecast through a bottom up forecast it benefits in three ways:

1. it retains the revenue provided to undertake the work in the base year
2. it obtains an EBSS efficiency benefit in the following period equal to four times the non-recurrent efficiency gain from not undertaking the work in the base year
3. it obtains an allowance to undertake the same work in the following period.

This provides the service provider a strong incentive to shift costs out of the base year where it expects a bottom up forecasting method will be used to forecast expenditure for that cost category.

TransGrid's observed MOPs expenditure is consistent with a service provider's incentive to minimise expenditure in the anticipated base year to maximise its EBSS rewards. The year with the lowest MOPs expenditure was 2012–13, as can be seen in figure 7-5. Up to and including 2012–13 TransGrid spent $12.8 million (2013–14) or 33 per cent less than its allowance for MOPs. Under TransGrid's proposal, in addition to retaining this underspend, it would receive an additional $15.6 million (2013–14) EBSS carryover attributable to this underspend. This would not fairly share the efficiency gains made by TransGrid in that period.

There is typically considerable management discretion available to re-prioritise and time-shift MOPs, and respond to this incentive to minimise expenditure in the anticipated base year. The movement in the level and timing of MOPs tends to have a relatively slow and incremental effect on the risks of the

[40] NER, cl. 6A.6.6(c).
[41] NER, cl. 6A.6.6(e)(8).
[42] NER, cl. 6A.6.5(a).

business and on the lifecycle economics of asset management. Using revealed costs ensures consumers experience the benefits of such management decisions. This is because, if a service provider reduces MOPs expenditure in the base year, by deferring a project for example, there is a corresponding decrease in the opex allowance in the following period. The net impact of the EBSS and the single year revealed expenditure forecast is that the service provider retains 30 per cent of the benefit of the cost reduction.

This discretion to re-prioritise and time-shift MOPs projects can be seen in the projects undertaken by TransGrid in the 2009–14 regulatory control period. In our 2009 determination we accepted TransGrid's forecast of $47.5 million (2013–14) of opex for MOPs. Up to and including 2012–13 TransGrid spent $12.8 million (2013–14) or 33 per cent less than its allowance. We asked TransGrid to identify how these cost reductions were achieved. It stated its MOPs allowance for the 2009–14 regulatory control period was based on a modified base step trend method, not a bottom-up portfolio of projects. For this reason, it could not directly identify the driver of underspends on a project by project basis. It estimated that, for the 2009–14 regulatory control period it reduced MOPs expenditure by:[43]

- $0.7 million (2013–14) by completing projects for less than forecast due to lower labour costs than forecast
- $14.7 million (2013–14) by reporting expenditure on forecast MOPs as a different category of opex
- $0.1 million (2013–14) by reporting expenditure on forecast MOPs as capex
- $2.7 million (2013–14) by deferring forecast MOPs into the 2009–14 period (and including them in the MOPs forecast for a second time)
- $4.2 million (2013–14) by not undertaking forecast MOPs having determined they were no longer required.

We were unable to reconcile the MOPs underspend identified by TransGrid with actual MOPs expenditure reported in its regulatory accounts and the forecast amounts in the post-tax revenue model. We do note, however, that TransGrid has changed its forecasting method for MOPs.

Further, based on TransGrid's response, 66 per cent of the underspend is attributable to works forecast as MOPs being reported as another category of opex. This raises questions about whether TransGrid has reported and forecast its MOPs expenditure on a consistent basis. If these have not been treated consistently then the total opex forecast will overcompensate TransGrid. Given the nature of MOPs, the specific projects undertaken from year to year will vary making it difficult to identify inconsistent categorisation of maintenance expenditure. This difficulty does not arise under our forecasting approach where we leave reported MOPs in base opex and forecast opex at the total level rather than at the category level.

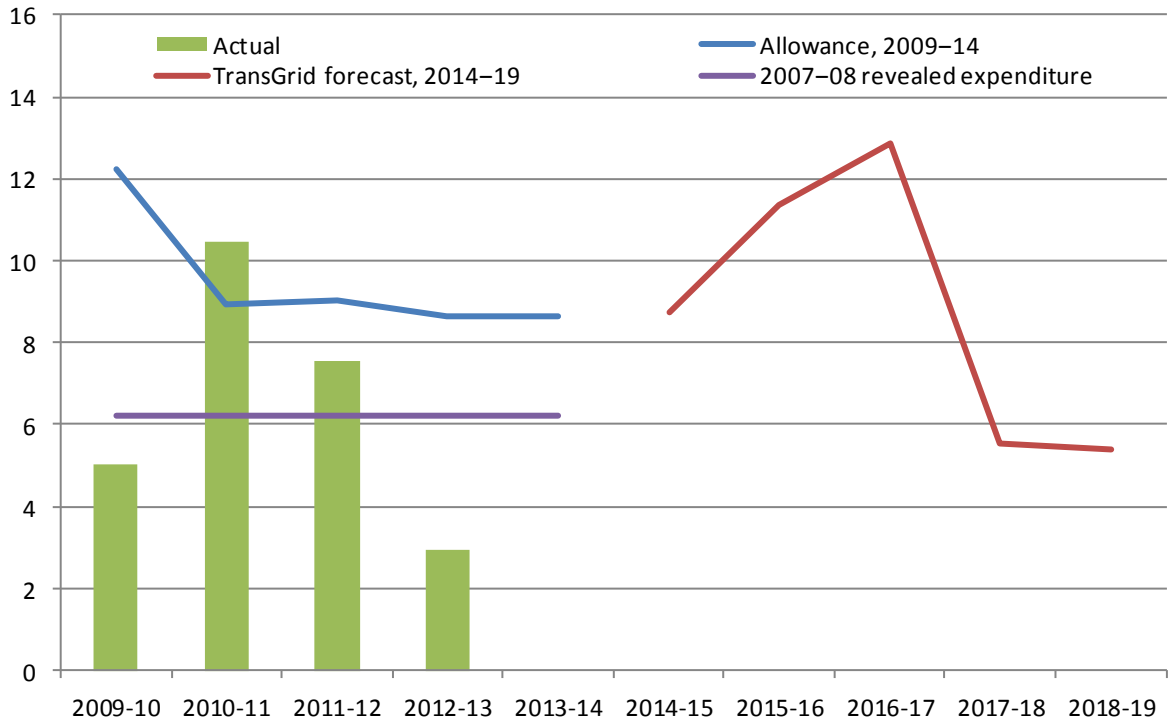
Based on the information reported by TransGrid in its regulatory accounts, it spent an average $6.5 million (2013–14) on MOPs per year over the 2009–10 to 20012–13 period. This compared to its revealed expenditure in 2007–08 of $6.2 million (2013–14). Consequently, a revealed cost forecast of MOPs for the 2009–14 regulatory control period would have been more accurate than the forecast proposed by TransGrid and which we accepted.

---

[43] TransGrid, *Response AER TransGrid Opex 12 – Major Operating Projects*, 12 September 2014.

For the reasons above, we are not satisfied that forecasting MOPs on bottom up basis will produce a total opex forecast consistent with the opex criteria. We have used our revealed costs approach, as outlined in our guideline, to forecast total opex inclusive of MOPs.

Figure 7-5 Forecast and actual MOPs expenditure ($million, 2013–14)



Source: TransGrid opex model

Insurance and self-insurance

TransGrid, proposed a bottom up forecast of insurance of $27.7 million for the 2014–18 regulatory control period.[44] It did not propose any self-insurance. Its proposed insurance forecast is based on an estimate from SICorp, the NSW Government self-insurer.[45] 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 $1.8 million (2013–14) higher.

In our past determinations we have not adopted a consistent approach to forecasting insurance and self-insurance costs. In some decisions we have included bottom-up forecasts for insurance and self-insurance. In other decisions these costs have just been included in base opex.

We have reconsidered our approach to forecasting insurance and self-insurance costs and think these costs should be left in the base. As outlined in the *Expenditure Forecasting Assessment Guideline*, base year expenditure is escalated by the forecast rate of change in opex, which includes forecast price change.[46]

If we exclude opex categories that are rising faster than total opex from base opex then the remaining categories will be rising at a slower rate than total opex or declining. If we apply the total opex rate of change to those remaining categories then the total opex forecast will systematically exceed the

---

44 TransGrid, *TransGrid opex model, Forecast opex summary*, June 2014.
45 TransGrid, *Revenue proposal*, May 2014, p. 136.
46 AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013, pp. 22–23.

efficient level of opex. Frontier Economics made this point when they reviewed the forecasting approach adopted by SP AusNet to forecast its electricity transmission opex:[47]

> In our view, such 'cherry-picking' would likely result in aggregate controllable opex being systematically and inefficiently over-forecast. This is because with overall controllable opex fairly stable over time, the exclusion of components forecast to rise from the single base year forecasting approach would imply that the remaining components of controllable opex—those subject to the single base year approach—would exhibit a falling trend. However, as a premise of the single base year approach is that future expenditure should mimic past expenditure, using such an approach to forecast expenditure components known to be in a falling trend would tend to result in the forecasts for these components being too high. Therefore, combining a bottom-up approach for rising trend components of opex with a single base year approach for falling trend components of opex would tend to result in an overall controllable opex forecast that systematically exceeded the efficient level of expenditure.

We note that the market price for insurance can, and does, change at a different rate than total opex. 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 consider that forecasting the price change 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.

Employee entitlements

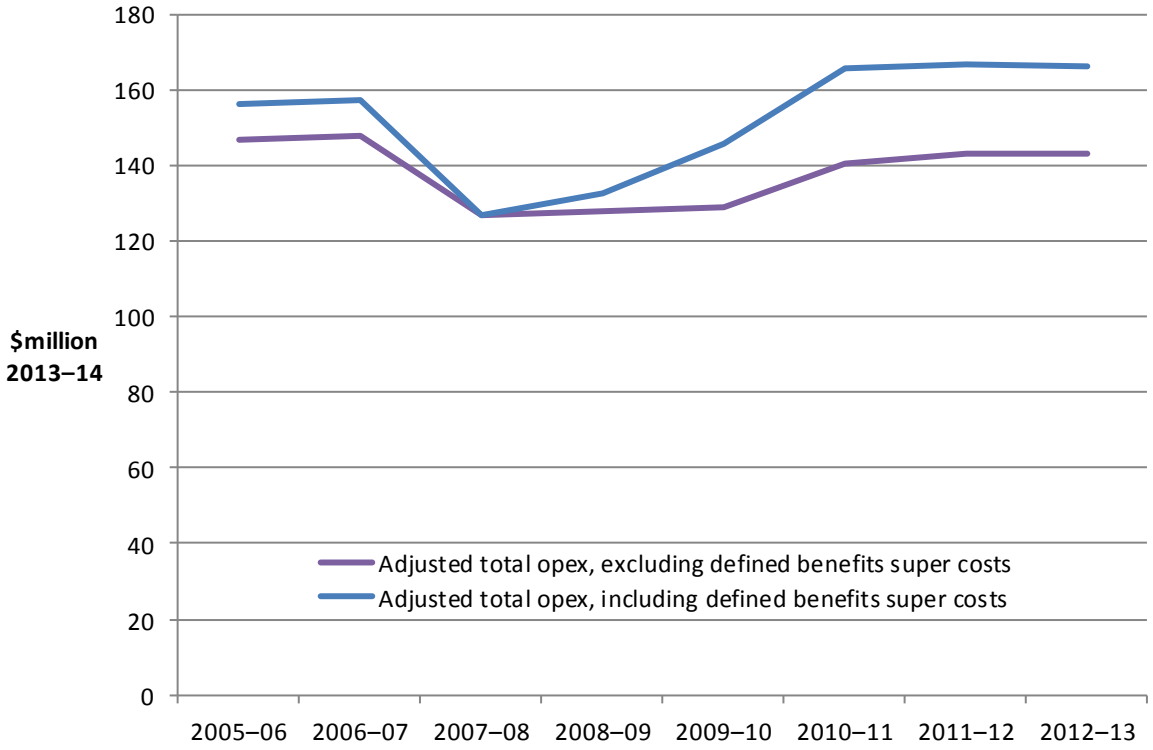
TransGrid proposed a bottom up forecast of employer contributions for defined benefits superannuation obligations and for forecast cash on long service leave entitlements. It considered the forecast cash costs for these entitlements to be more reflective of the costs it incurred in the base year.[48]

For defined benefits superannuation, we agree with TransGrid's forecasting approach. As discussed above, when considering whether to forecast a cost category separately the appropriate question is whether total opex is recurrent when that category is included. We found removing defined benefits superannuation cost produced a more stable and recurrent opex series (figure 7-6). Having removed it from base opex we need a forecast of defined benefits superannuation costs for the 2014–18 period.

---

47 Frontier Economics, *Opex forecasting and EBSS advice for the SP AusNet final decision*, January 2014, p 17.
48 TransGrid, *Response to AER TransGrid Opex 001*, pp. 2–3.

Figure 7-6 Impact of defined benefits superannuation costs on opex ($million, 2013–14)



Note: Total opex excludes movements in provisions and network support costs.
Source: AER analysis

TransGrid forecast a substantial decline in the contributions it will make in the 2014–18 period compared to the contributions it made in the base year. This is based on advice from Mercer, the actuary for the Energy Industries Superannuation Scheme to which TransGrid contributes. Therefore, if we used the contributions TransGrid made in the base year, we would over-estimate its recurrent opex. Given this factor we consider it is reasonable to forecast these costs using an alternative methodology and we have used Mercer's forecasts in our substitute opex forecast.

On the other hand, the annual opex TransGrid incurs on long service leave entitlements is relatively recurrent and less material than its defined benefits superannuation contributions. TransGrid's total opex, including long service leave entitlements, is broadly recurrent. Given this we have included the long service leave entitlements TransGrid incurred in 2012–13 in the base year when forming our substitute opex forecast.

Forecast volume change

TransGrid used two methods to forecast maintenance volume change:

1. bottom up forecasts for preventative maintenance
2. the bottom up preventative maintenance volumes multiplied by an historic average defect ratio for corrective maintenance.

It multiplied these volume forecasts by base year unit rates to forecast maintenance expenditure.

Relying on bottom-up volume forecasts reduced TransGrid's preventative maintenance expenditure forecast by $6.4 million (2013–14) compared to relying on the volumes revealed in the base year (which is implicit under a standard revealed expenditure approach). Similarly it reduced its corrective

maintenance forecast by $13.9 million (2013–14). This does not include the impact of the forecast defect ratio on corrective maintenance, which we discuss below.

Under these forecasting methods, TransGrid had an incentive to reduce volumes in 2012–13 under the EBSS. The volume reduction would generate an EBSS reward equal to four times the volume driven expenditure reduction, but because the volume forecast is bottom-up, there would be no corresponding impact on the opex forecast.[49] Given these incentives we have further assessed the proposed forecast.

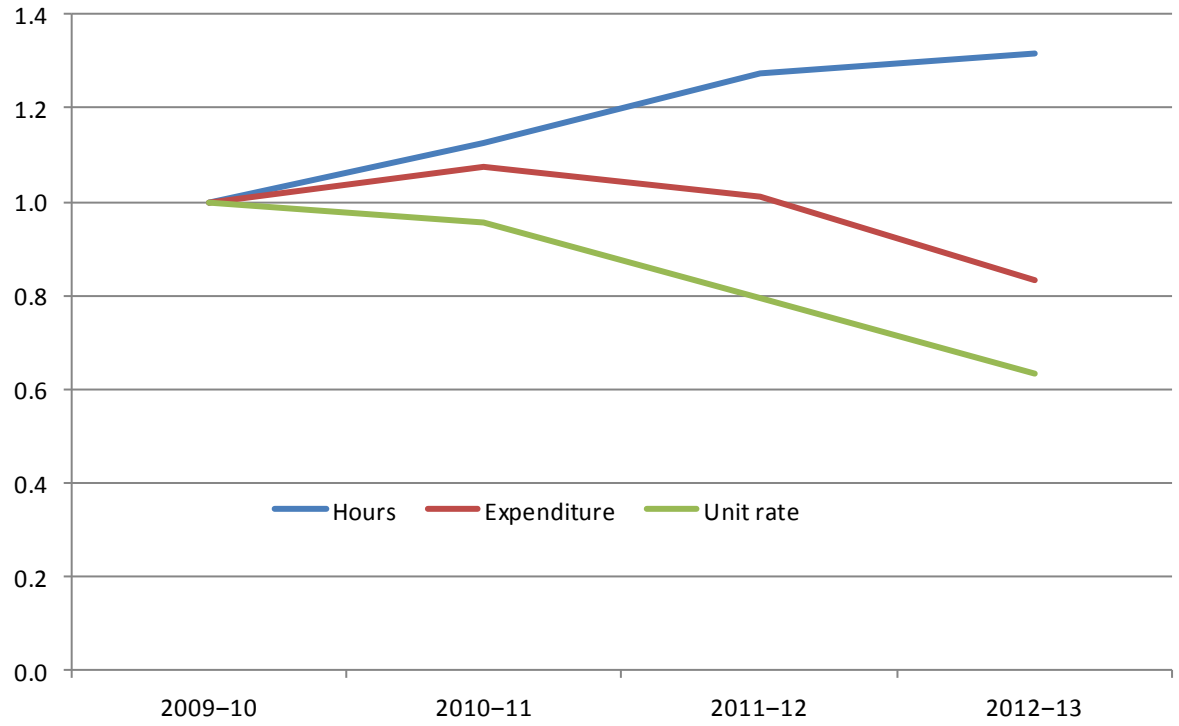
Preventative maintenance

In assessing the reasonableness of TransGrid's forecasting method for preventative maintenance, we looked at the hours of preventative maintenance work undertaken by TransGrid in the 2009–14 regulatory control period. We note that more hours of work were undertaken in the proposed base year than in any other year. Further, the hours forecast by TransGrid are less than those in the proposed base year (2012–13). This suggests TransGrid has not responded to the incentive to reduce volumes in the expected base year.

TransGrid's method for forecasting preventative maintenance expenditure relies on the assumption that unit rates are recurrent. It also assumes preventative maintenance expenditure is correlated to number of hours worked. However, TransGrid's preventative maintenance expenditure during the 2009–14 regulatory control period does not exhibit these characteristics. As we can see in figure 7-7, the preventative maintenance expenditure unit rate fell 37 per cent in the 2009–14 regulatory control period. At the same time preventative maintenance expenditure fell 17 per cent despite the hours worked rising 32 per cent. Consequently we are not satisfied that forecasting preventative maintenance expenditure using a bottom up volume forecast produces a total opex forecast consistent with the opex criteria. We have used our guideline forecasting approach to forecast our substitute total opex forecast inclusive of preventative maintenance.

[49] The EBSS carries forward efficiency gains and losses for five years. Consequently reducing opex in 2012–13 (the second last year) increased the carryover amounts in the first four years of the following period by the same amount as the reduction. The EBSS that applied to TransGrid also assumed efficiency gains in 2013–14 were zero. This is because the EBSS assumed efficiency gains or losses made in 2013–14 would be carried forward by the opex forecast. A bottom up volume forecast would not carry forward the volume derived efficiency losses made in 2013–14.

Figure 7-7 Preventative maintenance (2009–10 = 1)



Source: AER analysis

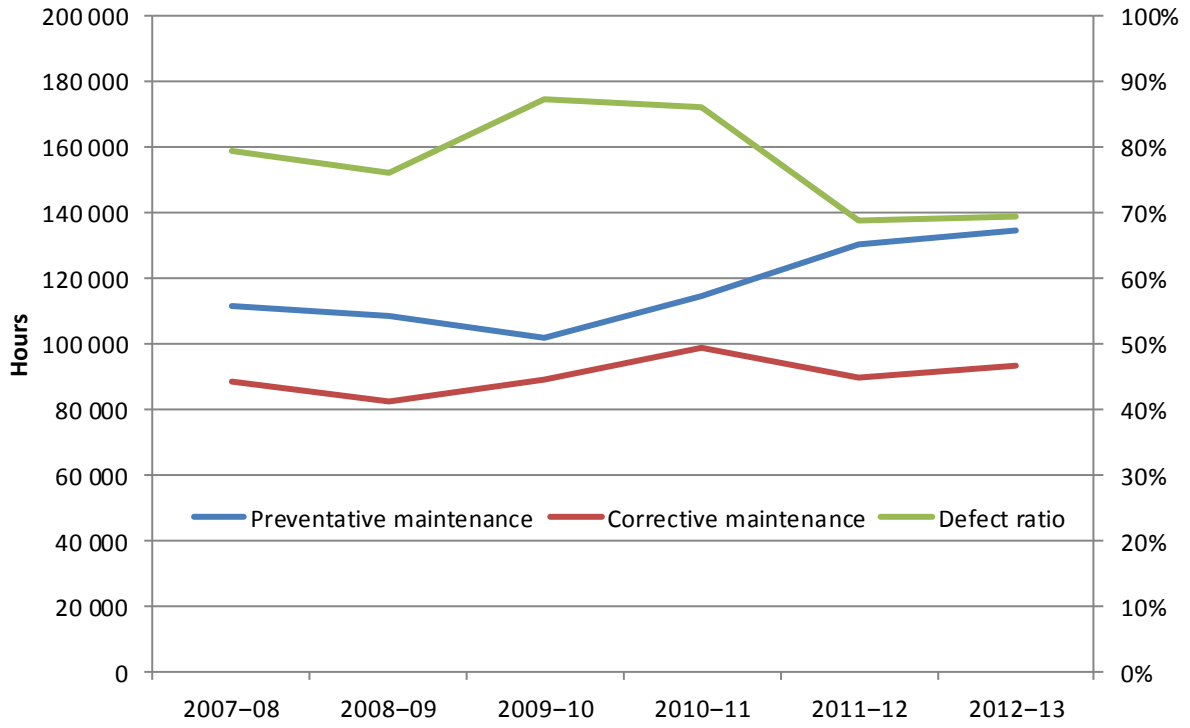
Defect ratios and corrective maintenance

TransGrid conducts corrective maintenance as needed based on equipment condition. It forecast corrective maintenance volume by applying a forecast 'defect ratio' to preventative maintenance volume. The defect ratio was forecast based on the historic ratio of corrective maintenance hours to scheduled preventative maintenance hours.[50] It then forecasts corrective maintenance opex by multiplying the forecast corrective maintenance volume by the unit rate revealed in the base year. Had it relied on the defect ratio revealed in the base year (which is implicit under a standard revealed expenditure approach) TransGrid's opex forecast would be $16.1 million (2013–14) lower.

It is counterintuitive that an increase in preventative maintenance volume would result in an increase in corrective maintenance volume. Usually preventative and corrective maintenance are substitutes. If a service provider undertakes more preventative maintenance we would expect, all else being equal, that less corrective maintenance would be required, at least in the long run if not the short run. Generally we would expect that if a service provider does preventative maintenance to maintain the condition of its assets then corrective maintenance effort should be fairly recurrent with some year to year variation (before adjusting for output growth). Indeed, this is what we see occurred in the 2009–14 regulatory control period (figure 7-8). Preventative maintenance volume rose 32 per cent while corrective maintenance effort was mostly stable, rising 5 per cent by 2012–13.

[50] TransGrid, *Revenue proposal*, May 2014, pp. 141–142.

Figure 7-8 Maintenance volume (hours)



Source: TransGrid, response to information request AER TransGrid opex 08

We are not satisfied the approach TransGrid has used to forecast corrective maintenance is supported by the evidence in the 2009–14 regulatory control period. TransGrid's approach yields annual corrective maintenance expenditure $7.1 million (2013–14), or 19.8 per cent higher than expenditure in the base year. Of this $4.0 million (2013–14), or 10.4 per cent, is due to the use of an historic average defect ratio. This is despite the fact corrective maintenance effort rose only 5 per cent between 2009–10 and 2012–13.

Consequently we are not satisfied that forecasting corrective maintenance expenditure using a bottom up preventative maintenance volume forecast and a historic average defect ratio produces a total opex forecast consistent with the opex criteria. We have used our revealed costs approach, as outlined in our guideline, to forecast our substitute total forecast opex inclusive of preventative maintenance.

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.[51] We have found no evidence that TransGrid's base opex is materially inefficient. Our considerations in forming this view are set out below.

Which year should be the base year?

We used 2012–13 as the base year for our forecast of opex. We used this to test TransGrid's opex forecast against the opex criteria.

[51] As discussed above in section 7.4.2 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

Our choice of base year is consistent with TransGrid's choice of base year. It proposed the use of 2012–13 as the base year (subject to adjustments) because:[52]

- it was the most recent year for which audited actual expenditure is available when it submitted its proposal;
- the regulatory framework provides incentives to minimise costs in this year; and
- it considered it benchmarked favourably with its peers in Australia and overseas.

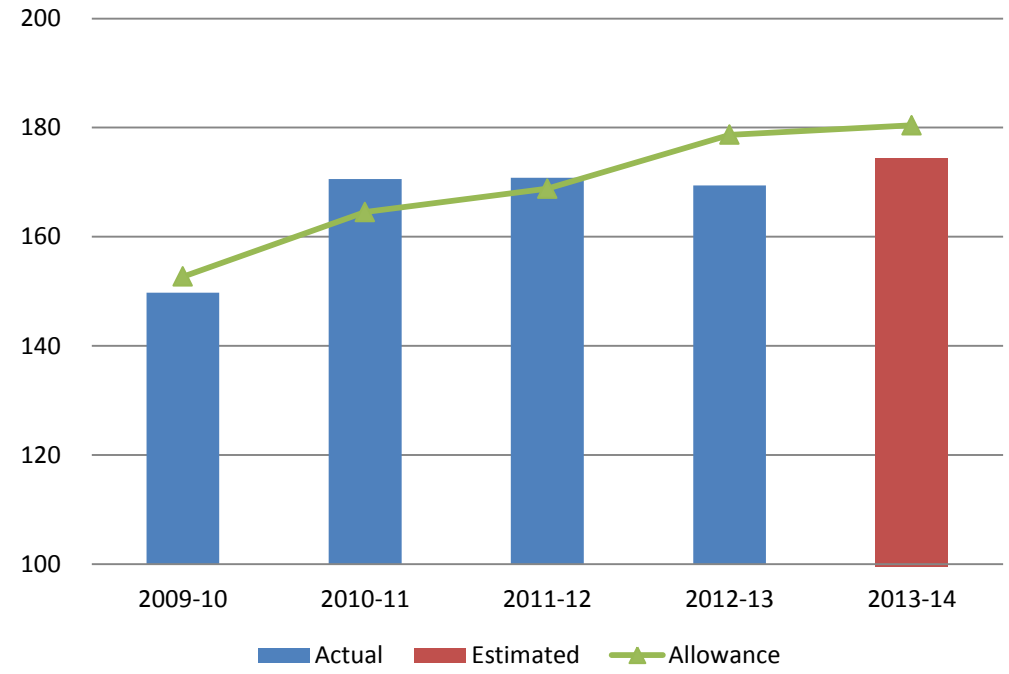
Subject to our review of the benchmarking, we considered using 2012–13 as the base year to forecast opex for the 2014–18 period will produce opex forecast consistent with the opex criteria because:

- To the extent expenditure drivers change over time, the most recent year with available data is likely to best reflect expenditure in the forecast period.
- Once opex is adjusted for movement in provisions, network support costs and defined benefits superannuation costs are removed, total opex is steady from 2010–11 (Figure 7-4). The stability of opex is consistent with a business responding to the constant incentive to reduce opex provided by the EBSS.
- When assessing the service providers opex forecasts we must have regard to whether the opex forecast is consistent with the EBSS.[53] The EBSS that applied to TransGrid in the 2009–14 regulatory control period assumes 2012–13 is the base year used to forecast opex for the 2014–18 period. If the EBSS and opex forecast assume different base years then network users may not receive their share of efficiency gains. Therefore, using a 2012–13 base year for forecasting opex is consistent with the operation of TransGrid's EBSS.

TransGrid proposed adding $2.2 million back into the 2012–13 base year expenditure to account for easement management that was not undertaken due to a dispute with a contractor. TransGrid also proposed removing this amount from the EBSS calculations so as not to unfairly realise a gain via both EBSS efficiencies realised in the base year and the reinstatement of the costs into the projected base year. We consider that the same effect can be realised in the opex forecast by retaining the base year and allowing the EBSS to account for the easement management underspend. Therefore we have used TranGrid's unadjusted 2012–13 opex as our base year opex for the purpose of estimating our alternative opex forecast.

[52] TransGrid, *Revenue proposal*, May 2014, pp. 122.
[53] NER cl. 6A.6.6(e)(8).

Figure 7-9 TransGrid's actual opex ($m real 2013-14)



Source: TransGrid, Opex Model, May 2014, AER final decision TransGrid PTRM_Tribunal varied.xls
Note: Opex minus network support costs and provisions.

How efficient is the revealed expenditure in the base year?

We have no evidence to suggest that TransGrid's revealed base year expenditure is materially inefficient. In arriving at this conclusion we had regard to the results of various benchmarking analysis. On the whole, our benchmarking analysis for TransGrid is inconclusive.

We have several assessment techniques available to us to assess the efficiency of base opex for transmission network service providers. These include:

- Multilateral total factor productivity (MTFP) / MPFP
- Partial performance indicators (PPIs)/ category analysis
- Detailed engineering review.

In considering which techniques to apply we considered what high level indicators are showing before committing to more detailed and intrusive techniques.

Economic benchmarking

We examined TransGrid's opex relative to other transmission network service providers in our *Annual Benchmarking Report for Electricity Transmission Service Providers* (benchmarking report).[54]

One approach applied in the benchmarking report is multilateral total factor productivity (MTFP). Using MTFP we measure the productivity of transmission networks across time and against each other. MTFP measures total outputs relative to all inputs and takes into account the multiple types of inputs and outputs of transmission networks. In the benchmarking report we recognise that work on

[54] AER, *Electricity transmission network service providers annual benchmarking report*, November 2014.

whole-of-business benchmarking of transmission networks remains in its infancy. We consider there remain a number of analytical challenges that need to be overcome before firm conclusions can be drawn regarding the relative efficiency of transmission networks.[55]

It is difficult to draw any firm conclusions regarding the relative efficiency of the transmission networks—including TransGrid—based upon the benchmarking results in the report given the developmental nature of the benchmarking results presented.

We consider however, that our opex MPFP growth rate is an appropriate basis for forecasting the rate of change in opex going forward. As noted by Economic Insights, output growth rates and opex input quantity growth rates can be calculated with a higher degree of confidence and used to forecast opex partial productivity growth for the next regulatory period.[56]

Partial performance indicators

In assessing the efficiency of TransGrid's opex, we do not consider that any significant conclusions can be drawn from its performance under the partial performance indicators (PPIs).

In our benchmarking report we examined a number of opex PPIs to compare the relative performance of transmission businesses. PPIs are used to compare the performance of businesses in delivering one type of output. PPIs provide a useful means of comparison on certain aspects of the business' operation. For example, they may provide an indication of where certain expenditure may be above efficient levels, once normalisation for non-efficiency factors has been undertaken. Variations in a service providers' performance could be attributable to differences in the nature of the transmission networks, which mean that the relative quantum of their outputs differs depending on the output measure selected. Service providers have discretion in how they allocate resources due to expenditure trade-offs, such as repairing equipment (opex) or replacing equipment (capex). We need to consider the expenditure trade-offs in our opex assessment when using PPIs.

The results of the opex PPI analysis appear in Appendix A of the benchmarking report.[57] TransGrid appear to be a mid-range performer on opex per total entry/exit point voltage, and on opex per km of circuit line length. TransGrid performs favourably on opex per MW of maximum demand served, and on opex per MVA of downstream transmission capacity. Based on the fact that TransGrid performs well on some measures and not on others, we cannot draw the conclusion that TransGrid's base opex is materially inefficient.

We also had regard to the various reports submitted by TransGrid in support of the efficiency of its base year:[58]

- The ITOMS report indicated that TransGrid was below the Asia-Pacific average on maintenance costs. However, this is plotted against composite service level, which reflects reliability performance. TransGrid was below average on composite service level while the Asia-Pacific group was above average.[59]

---

55 AER, *Electricity transmission network service providers annual benchmarking report*, November 2014, p. 6.
56 Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and Tasmanian Electricity TNSPs*, November 2014, p.2.
57 AER, *Electricity transmission network service providers annual benchmarking report*, November 2014, pp. 26–28.
58 TransGrid, *Revenue proposal*, May 2014, p. 144.
59 TransGrid, *Revenue proposal*, May 2014, Attachment: UMS Group, *Report on…International Transmission Operations and Maintenance Study (ITOMS) And International Transmission Asset Management Study (ITAMS) For TransGrid, NSW , AU*, May 2014 [PUBLIC VERSION], p. 11.

- TransGrid is the only Australian transmission network service provider represented in the sample in the ITAMS report. The ITAMs survey focused on four areas: operating model, process, competences, information management and enabling technology. From a sample of 13 businesses, TransGrid was ranked 5th on the composite measure of operating model, process, competences plus information management and technology and 7th on operation performance. TransGrid's performance was average on asset management FTEs against opex, had higher than average numbers of asset management FTEs compared with asset management cost and had average numbers of asset management FTEs compared to circuit length.[60]

- The UMS corporate overheads report benchmarked 16 Australian electric utility networks. TransGrid performing below average on some measures and above average on others.[61]

- The Mercer report benchmarked a small number of utility companies. TransGrid's relative performance was mixed across the different corporate overhead components.[62]

Our view is that we are unable to draw any consistent conclusions regarding the efficiency of the base year opex from these reports.

7.4.3 Network support

We have not included TransGrid's proposed network support expenditure in our alternative estimate of total opex. This is because we consider that:

- it is not prudent for TransGrid to pre-emptively procure network support

- given Ausgrid has revised downward its forecast of peak demand in its 2014 draft updated demand forecast, demand is likely to be even lower as a result of demand management and embedded generation initiatives in the area. As such, the requirement for the 'Powering Sydney's Future' capex is deferred to well beyond the 2015-18 regulatory period and so therefore the need for network support as an alternative to capex is not required in this regulatory period. For this reason the AER has not approved it as a contingent project in our review of TransGrid's forecast capex.

TransGrid proposed $26.4 million for the 2014-15 to 2017-18 period (see table 7-4). This is to be directed towards pre-emptive procurement of network support with the objective of promoting the demand response market in the 'Powering Sydney's Future' project area. TransGrid stated that it proposes to use this secured network support to defer capital investment from 2018-19 onwards.[63] The capital investment that the network support may defer is a contingent project, 'Powering Sydney's Future'.[64] We note that this was also proposed by TransGrid as a contingent project in the last reset.[65]

---

60 TransGrid, *Revenue proposal*, May 2014, Attachment: UMS Group, *Report on…International Transmission Operations and Maintenance Study (ITOMS) And International Transmission Asset Management Study (ITAMS) For TransGrid, NSW , AU*, May 2014 [PUBLIC VERSION], pp.13,18-19.

61 TransGrid, *Revenue proposal*, May 2014, Attachment: UMS Group, TransGrid, NSW, Corporate Overheads High Level Comparative Assessment Final Report, 24 Mar 2014 [PUBLIC VERSION], pp.14-20, 23-38.

62 TransGrid, *Revenue proposal*, May 2014, Attachment: Mercer, Human Resource Effectiveness Monitor 2012 Edition, October 2012 [PUBLIC VERSION], pp. 81-90.

63 TransGrid, *Revenue proposal*, May 2014, p. 100.

64 TransGrid, *Revenue proposal,* May 2014, pp. 81-83.

65 AER, *Final Decision, TransGrid transmission determination 2009–10 to 2013–14*, 28 April 2009, p. 158.

Table 7-4 TransGrid's proposed network support opex for 2014-15 to 2017-18 ($m, real $2013-14) and quantity of network support proposed to be procured

	2014-15	2015-16	2016-17	2017-18	Total
Proposed allowance	5.3	6.2	7.1	7.8	26.4
Effective MW to be procured	34	69	103	138	

Source: TransGrid, Opex model, 'Forecast Opex Summary' tab, TransGrid Revenue Proposal, p.136

We do not disagree with EnerNOC, which submitted that TransGrid's approach to developing network support capacity would provide a more cost effective and lower risk outcome than attempting to develop a project at the last minute.[66] We consider that demand management as an alternative to capex should be an option analysed by TransGrid in arriving at the most prudent and efficient option in relation to any capacity shortfall as described in the 'Powering Sydney's Future' project.

We concur with the EUAA and the generators' views presented in their respective submissions. The EUAA questioned the prudency of entering into pre-emptive network support agreements up to 4 years ahead of need.[67] A joint submission from generators[68] noted that recent demand trends in the Sydney CBD area have been negative and stated that it was difficult to reconcile TransGrid's forecast for demand growth with the recent trends. The generators submitted that any delay in the return to growth would see the pre-emptive network support services sunk and making no contribution to the reliability of the network.[69]

TransGrid has indicated that it already has a database of consumers who are able to reduce peak demand for electricity in the inner Sydney region. In its previous revenue proposal TransGrid indicated that via its Demand Management and Planning Project:[70]

> "[i]nitiatives to gather information on opportunities for reducing demand have been instigated at more than 700 sites in St George/Sutherland, Sydney CBD, North Sydney, the Inner West and East Sydney. The project, to be completed by June 2008, produced a comprehensive database of opportunities for the reduction of peak demand."

Furthermore, we consider that in undertaking its ongoing network planning TransGrid is required to be aware of the load magnitude and timing of its directly connected customers. We consider that TransGrid is able to directly negotiate with these customers regarding any demand management opportunities in advance of its requirement. We do not consider that pre-emptive purchasing network support is what a prudent operator would do in relation to these customers.

Further we do not approve TransGrid's proposed 'Powering Sydney's Future' capex as a contingent project (see our capex attachment). This is because Ausgrid revised down its peak demand forecast, which defers the requirement for the 'Powering Sydney's Future' to well beyond the 2015-18 regulatory period.

---

66 EnerNOC, *Submission to TransGrid issues paper*, August 2014, p. 2.
67 Energy Users Association of Australia, *Submission to TransGrid issues paper*, August 2014, p. 11.
68 The generators include Delta Electricity, Snowy Hydro, Stanwell Corporation, ERM Power, Hydro Tasmania, Energy Australia, GDF Suez Australian Energy, Alinta Energy, Origin Energy and CS Energy.
69 Listed generators, *Submission to TransGrid issues paper*, August 2014, p. 4.
70 TransGrid, *Revenue Proposal*, 31 May 2008, p. 31.

Given that we do not approve the contingent 'Powering Sydney's Future' project and our view is that contractual arrangements for network support may be explored by TransGrid without incurring costs for network support, we have not included TransGrid's proposed network support expenditure in our alternative opex forecast.

We note that TransGrid is proposing to withdraw the pre-emptive network support on the basis of the updated Ausgrid demand forecasts.[71]

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. Our assessment of step changes is made in the context of our assessment of the total forecast operating expenditure in the service provider's proposal. When assessing a service provider's proposed step changes, 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.

Further to assessing whether step changes are captured in other elements of the opex forecast, we 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 an efficient cost will be incurred for an activity that was not previously undertaken. Our opex forecasting approach may already capture these costs elsewhere.

We have not included all of TransGrid's proposed step changes in developing our alternative estimate of the total opex forecast. For some of the proposed step changes there is no change in regulatory obligation 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.

For two of the step changes we assess that the proposed costs are not efficient and we have provided replacement forecasts. However, in calculating our productivity forecast it is possible to either use historical opex data, which includes past step change expenditure, or use historical opex data with the past step change expenditure excluded. Applying the former method results in a lower productivity forecast and no separate step change compensation unless it is greater than the step change amount captured in the productivity forecast. The later method results in a higher productivity forecast and requires separate, additional expenditure for step changes. For the TransGrid draft decision we have applied the lower productivity forecast and have made no separate provision for step changes. This is because the step change increment already captured in our productivity

[71] TransGrid, *Sydney inner metropolitan forecasts - adjustments to revenue proposal in light of Ausgrid updated forecasts*, 14 October 2014.

forecast over the 2014-18 period is $7.5 million, which more than compensates for the $2.8 million of expenditure we assessed as justified for step changes. We did not include the 'Change to Sydney office accommodation' step change in the total step change amount we netted off the step change increment captured in our productivity forecast because this step change does not represent an increment or decrement in expenditure. In being a capex/opex trade-off it is effectively a transfer of expenditure from opex to capex. That is, the same output (accommodation services) is being produced in a different way - building construction (capex) instead of entering into a building lease (opex).

For more detailed discussion of our decision see appendix A.

Table 7-5 AER's assessment of TransGrid's proposed step changes ($m, real 2013–14)

Title	TransGrid	AER	Reasons
Change to Sydney office accommodation (Accommodation strategy)	–6.4	–6.4	We considered that this was a prudent and efficient capex/opex tradeoff.
Payroll efficiencies (Improvements in IT systems to automate payroll functions)	–2.6	–	We considered this step change in our assessment of TransGrid's forecast change in productivity.
Closure of Yass control room (Efficiency improvements to control room rosters)	–0.3	–	We considered this step change in our assessment of TransGrid's forecast change in productivity.
Rental fees for communication towers on Crown lands	0.5	–	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.
Ongoing requirements arising from our new regulatory guidelines (New regulatory obligations)	2.4	–	TransGrid's proposed internal labour rates and hours and auditing costs were significantly higher than those proposed by other businesses. We scaled TransGrid's proposed costs back to the average of comparative business' step changes. However, this step change is more than offset by the reduced productivity change estimate we have incorporated into the rate of change for our alternative estimate of total opex.
Transfer of AEMO system operator functions (New regulatory obligations)	3.6	–	We accept that this step change represents a change in how the costs of performing this function are recovered. However, we assess that the costs are not prudent and efficient. Furthermore, this step change would be more than offset by the reduced productivity change estimate we have incorporated into the rate of change for our alternative estimate of total opex.
Easement maintenance (Catch up after response to safety obligations and cost escalation)	6.4	–	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 costs would materially alter.
Consumer engagement program (New regulatory obligations and to meet changing consumer	8.8	–	We consider that much of the proposed expenditure represents business as usual processes rather than new regulatory obligations.

Title	TransGrid	AER	Reasons
expectations)			TransGrid did not provide a business case setting out the specific details of its consumer engagement and an assessment of the associated costs and benefits in order to substantiate the proposed expenditure.
Increase in demand management innovation allowance (Proactive approach to encouraging demand management)	10.2	–	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.
Revenue reset (Regulatory obligation)	1.4	–	We consider that this represents a normal variation in business expenditure which is best dealt with through the operation of the EBSS.
Total	24.3	–6.4	

Source: TransGrid, Response to AER TransGrid Opex 03 and 04
Note: Totals may not reconcile due to rounding.

7.4.5 Rate of change

The efficient level of expenditure required by the services providers in the 2014–18 regulatory control 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 regulatory control 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 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 change variables capture the forecast change in the quantity of inputs required. The real price change variable captures the forecast change in the prices of those inputs.

We assessed TransGrid's proposed labour price changes, network growth and productivity 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 $11.6 million of the difference between TransGrid's proposed opex and our estimate.

Although the rate of change for 2014–15 is similar under both rate of change forecasts. There is a deviation in the forecast rate of change from 2015–16. Specifically the differences from 2015–16 onwards is driven by:

- The use of BIS Shrapnel labour forecast which are higher than ours which is based on an average of BIS Shrapnel and DAE.
- TransGrid's higher forecast output change which is calculated based on a function of its forecast capex. Our approach is based on TransGrid's outputs used in our MTFP analysis.

- We note TransGrid's forecast output change includes economies of scale and is still higher than our forecast output change which does not includes economies of scale which we included in our productivity assessment.
- TransGrid's forecast productivity change component is lower than ours. TransGrid's forecast productivity is a bottom up build of negative step changes. TransGrid's has included economies of scale, but has incorporated this into forecast output change.
- Our forecast of productivity is based on the historical electricity transmission industry productivity; this assumes that the electricity transmission industry's use of inputs to produce outputs in the previous eight years is an appropriate forecast of the productivity it can achieve for the forecast period. This results in our productivity forecast being higher than TransGrid's proposed productivity over the forecast period.

Table 7-6 Forecast rate of change (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid				
Price change	–0.05	1.15	1.62	1.80
Output change	0.97	1.13	0.79	0.22
Productivity change	0.32	1.17	0.04	0.01
Overall rate of change	**0.60**	**1.09**	**2.39**	**2.01**
AER				
Price change	0.49	0.47	0.76	0.89
Output change	1.31	0.45	0.20	0.52
Productivity change	0.86	0.86	0.86	0.86
Overall rate of change	**0.94**	**0.05**	**0.09**	**0.54**
Difference	0.34	–1.04	–2.30	–1.47

Source: AER analysis

Our in depth assessment of TransGrid's rate of change and our methodology for forecasting our rate of change is in appendix B.

7.4.6 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 the rate of return (attachment 3).

7.4.7 Interrelationships

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

- the operation of the EBSS in the 2009–14 regulatory control period in our assessment of TransGrid's forecasting method (see section 7.4.1)
- 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)
- 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)[72]
- the impact of forecast capex on forecast output change in the rate of change that we applied to the efficient base opex to develop our alternative estimate of total opex (see section B.4.3 of appendix B)
- 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 A).

7.4.8 Assessment of opex factors

In deciding whether or not we are satisfied the service provider's forecast reasonably reflects the opex criteria we have regard to the opex factors.[73] Table 7.7 summarises how we have taken the opex factors into account in making our draft decision.

Table 7-7 AER consideration of opex factors

Opex factor[(a)]	AER's consideration
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	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. 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. 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

72 NER clause 6A.6.6(e)(8)
73 The opex factors are set out in NER cl. 6A.6.6(e).

Opex factor[a]	AER's consideration
	modelling and partial productivity indicators included in our annual benchmarking report.[74] This report was published with the release of our TransGrid draft decision. 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.
The actual and expected opex of the service provider during any preceding regulatory control periods	Our revealed cost approach is based on an assessment of actual opex in the preceding regulatory control period. 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. 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.
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	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 regulatory proposals, such that they factor in the needs of consumers.[75] 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.
The relative prices of operating and capital inputs	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. 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.
The substitution possibilities between operating and capital expenditure	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

74 AER, *Electricity transmission network service providers annual benchmarking report*, November 2014.
75 AEMC, *Rule Determination*, 29 November 2012, pp. 101, 115.

Opex factor[a]	AER's consideration
	in capital in place of ongoing operations. 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.
Whether the operating expenditure forecast is consistent with any EBSS, STPIS or small-scale incentive scheme that applies to the service provider	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.
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 Rules, 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.
Note: (a) 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 regulatory proposal.[76] Table 7-8 identifies these factors.

Table 7-8 Other factor we have had regard to

Opex factor	Consideration
Our benchmarking data sets, including, but not necessarily limited to: 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.	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.

[76] NER, cl. 6A.6.6(e)(14).

A Step changes

Step changes allow for adjustments to the efficient starting point or underlying efficient level of expenditure we determine a service provider requires. The efficient starting point is assessed according to our Expenditure forecast assessment guideline.[77] Generally, if a service provider has operated under an effective incentive framework, and sought to maximise its profits, the actual opex incurred in a base year should be a good indicator of the efficient opex it requires. However, we must test this, and if we determine that a service provider's revealed expenditure does not reasonably reflect the opex criteria, we will adjust it appropriately.

This section sets out our assessment of the TransGrid's proposed opex step changes for the 2014–18 period.

A.1 Position

We have not included all of TransGrid's proposed step changes in developing our alternative estimate of the total opex forecast. For some of the proposed step changes there is no change in regulatory obligation 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.

For two of the step changes we assess that the proposed costs are not efficient and we have provided replacement forecasts. However, in calculating our productivity forecast it is possible to either use historical opex data, which includes past step change expenditure, or use historical opex data with the past step change expenditure excluded. Applying the former method results in a lower productivity forecast and no separate step change compensation unless it is greater than the step change amount captured in the productivity forecast. The later method results in a higher productivity forecast and requires separate, additional expenditure for step changes. For the TransGrid draft decision we have applied the lower productivity forecast and have made no separate provision for step changes. This is because the step change increment already captured in our productivity forecast over the 2014–18 period is $7.5 million, which more than compensates for the $2.8 million of expenditure we assessed as justified for step changes.

We did not include the 'Change to Sydney office accommodation' step change in the total step change amount we netted off the step change increment captured in our productivity forecast because this step change does not represent an increment or decrement in expenditure. In being a capex/opex trade-off it is effectively a transfer of expenditure from opex to capex. That is, the same output (accommodation services) is being produced in a different way – building construction (capex) instead of entering into a building lease (opex).

A.2 Proposal

TransGrid proposed three step change decrements and seven step changes above its base expenditure (see Table A-1). The positive step changes total $33.5 million (real 2013–14) over the 2014–18 period and represent 4.5 per cent of TransGrid's total proposed opex.

[77] AER, *Expenditure forecast assessment guideline*, 29 November 2013, p. 22.

Table A-1 TransGrid proposed step changes ($million, real 2013-14)

	2014–15	2015–16	2016–17	2017–18	Total
Change to Sydney office accommodation (Accommodation strategy)	-0.2	-2.1	-2.1	-2.1	-6.4
Payroll efficiencies (Improvements in IT systems to automate payroll functions)	-0.6	-0.6	-0.6	-0.6	-2.6
Closure of Yass control room (Efficiency improvements to control room rosters)	-0.1	-0.1	-0.1	-0.1	-0.3
Rental fees for communication towers on crown lands (IPART review of rental arrangements and fee schedules)	0.1	0.1	0.1	0.2	0.5
Ongoing requirements arising from the AER's new regulatory guidelines (New regulatory obligations)	0.6	0.6	0.6	0.6	2.4
Transfer of AEMO system operator functions (New regulatory obligations)	0.9	0.9	0.9	0.9	3.6
Easement maintenance (Catch up after response to safety obligations and cost escalation)	2.9	2.2	0.6	0.7	6.4
Consumer engagement program (New regulatory obligations and to meet changing consumer expectations)	2.3	2.2	2.1	2.2	8.8
Increase in demand management innovation allowance (Proactive approach to encouraging demand management)	1.1	2.3	3.3	3.6	10.2
Revenue reset (Regulatory obligation)	-0.1	0.5	0.9	0.1	1.4
Total (positive step changes)	7.8	8.8	8.5	8.3	33.5

Source: TransGrid, Response to AER TransGrid Opex 03 and 04.
Note: Totals may not reconcile due to rounding.

A.3 Assessment approach

In arriving at our alternative estimate of total opex forecast by which we assess TransGrid's proposed total opex forecast, we have applied the following techniques to assess whether TransGrid's proposed step changes should be included in that total estimate. Step changes may be added (or subtracted) if those costs are not captured in the base year or the rate of change are required for total forecast opex to meet the opex criteria.[78]

As discussed in section 7.4.4, we have assessed the efficiency of proposed base year opex and made adjustments where necessary to derive a forecast base opex consistent with the opex criteria. In assessing the proposed step changes we will need to consider the impact of what costs are accounted for in our base level of opex. A step change should not compensate a service provider for costs already included in the base year.

[78] AER, *Expenditure assessment forecast guideline*, November 2013, p. 24

We forecast opex by applying an annual 'rate of change' to the base year for each year of the forecast regulatory control 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 any of those three elements included 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.[79]

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 is likely to yield a biased forecast if we don't also apply a negative step change for costs that are increasing 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 the forecast base year opex. This forecast productivity factor captures 'average' change in technology, business practices, economies of scale and regulatory obligations over time. Our forecast is based on what services 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. For example, increased regulatory burden in the past typically would have reduced productivity growth. If we are using historical productivity growth to estimate future productivity growth, we must remember the historical productivity rate is what service providers have been able to achieve while meeting new regulatory requirements introduced at the time.[80] Consequently service providers will already be compensated for an increased regulatory burden. It would only require additional compensation where it faces greater increases in regulatory obligations than in the past.

Further to assessing whether step changes are captured in other elements of the opex forecast, we 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:[81]

- 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

---

79 AER, *Explanatory statement: Expenditure assessment forecast guideline*, November 2013, p.73. See, for example, our decision in the Powerlink determination; AER, *Final decision: Powerlink transmission determination 2012–17*, April 2012, pp. 164–5.

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

81 AER, *Expenditure assessment forecast guideline for electricity transmission*, November 2013, p. 11.

- 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 regulatory 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 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.[82] 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 more than offset by a reduction in labour costs if it is efficient.[83] 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.[84] For example, it may choose to lease vehicles when it previously purchased them. For these capex/opex trade-off step changes, we assess whether it is prudent and efficient to substitute capex for opex or vice versa. In doing so we assess whether the forecast opex over the life of the alternative capital solution is less than the capex in NPV terms.

A.4 Reasons for draft decision

Our reasoning in arriving at our decision in relation to each of TransGrid's proposed step changes is set out below.

Change to Sydney office accommodation

We have included TransGrid's proposed 'Change to Sydney office accommodation' step change in our alternative estimate of forecast total opex. Consistent with our guideline, this is because we consider that the proposed step change expenditure is an efficient capex/opex trade-off.[85]

---

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

83 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 2014-15 to 2016-17,* August 2013, pp. 240-241.

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

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

TransGrid undertook a review of its office accommodation in 2011. It considered a number of options and decided to construct a new office building above an existing TransGrid building at Ultimo. TransGrid relocated its Sydney staff to the Ultimo building in February 2014.

TransGrid's method for forecasting the step change consists of:

- Subtracting from the base year operating expenditure the lease expenses for the former Sydney CBD accommodation of $2.6 million.
- Adding the outgoings TransGrid will incur for the occupied portion of the new building, forecast at $464,000 plus escalation per year.
- Adding the costs associated with the termination of the lease for the former Sydney CBD accommodation in 2014-15 only.

We examined TransGrid's options analysis, where the decision to build (incurring capex) was considered against leasing options (incurring opex).[86] Overall, the cost was lower to build rather than lease. We therefore consider that it was prudent and efficient to incur capex, affording the proposed opex savings.

Payroll efficiencies

We considered TransGrid's proposed Payroll efficiencies' step change in our assessment of the productivity change component of the rate of change (see section B.4.4).

TransGrid streamlined its payroll administration in 2013 via improved software and online approval systems. As the cost savings were not realised in the base year, a negative step change reflecting those was proposed by TransGrid.[87]

Closure of Yass control room

We considered TransGrid's proposed 'Closure of Yass control room' step change in our assessment of the productivity change component of the rate of change (see section B.4.4).

While TransGrid indicates that most of the efficiencies related to changes in the control room arrangements, it proposed a negative step change to capture the residual cost associated with the closure of the Yass control room.[88]

Rental fees for communication towers on Crown lands

We have not included TransGrid's proposed Rental fees for communication towers on Crown lands step change in our alternative estimate of forecast total opex. This is because we consider that an increase in the rental fees represents a price increase which is already reflected in our forecast of price change. Consistent with our guideline, we would not compensate for a price increase via a step change as well as a through the rate of change as this would be double counting.[89]

---

86 TransGrid, *Response to information request AER TransGrid Opex02*, received 18 July 2014.
87 TransGrid, *Revenue proposal*, May 2014, p. 123.
88 TransGrid, *Revenue proposal*, May 2014, p. 124.
89 AER, *Expenditure assessment forecast guideline*, November 2013, p. 24.

The Independent Pricing and Regulatory Tribunal (IPART) completed a review of rental fees for Crown Land communication tower sites in New South Wales in July 2013.[90] TransGrid submitted that the rental fee schedule was updated as part of this review. TransGrid proposed a step change to reflect the rent increases in the IPART review, which would be attributable to its 41 communication tower sites on Crown land.[91]

The NSW Government accepted IPART recommendations on rental charges for telecommunications towers on Crown land on 22 September 2014.[92] Rental adjustments are to be phased in over five years, back dated to commence from 1 July 2013. The NSW Department of Primary Industries (DPI) supplied information on the change in rental fees for each classification of crown land, from this information we calculated that TransGrid will incur a change in rental charges from those incurred in the base year of $0.4 million over the 2014–18 period.[93]

Notwithstanding that there has been a change in legislative obligation, we consider that an increase in the rental fees is a price increase, akin to rent increases on property which is leased. Price increases are captured in our forecast of price change. To also include a step change would be a double counting of the price increase. We did not, therefore, include the proposed step change for increased rental fees for communication towers on Crown lands in our estimate.

Ongoing requirements arising from the AER's new regulatory guidelines

We have not included TransGrid's proposed 'Ongoing requirements arising from the AER's new regulatory guidelines' step change in our alternative estimate of forecast total opex. Consistent with our guideline, we consider that the AER's new guidelines do constitute a new regulatory requirement and should be compensated.[94] However, our estimate of the efficient costs of the step change is $1.1 million (real $2013–14) over the four year period.

Notwithstanding this, our productivity forecast for TransGrid is calculated using historical opex data which includes step change expenditure. This means that included in our productivity forecast is an allowance for step changes. The amount allowed for step changes over the 2014–18 period is $7.5 million. As the amount we considered was justified by TransGrid for step changes is less than $7.5 million we have not included any additional opex for step changes in our alternative forecast.

TransGrid submits that there are increased requirements to provide information imposed by our new Guidelines compared with the previous Guidelines and regulatory approach. TransGrid states 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 benchmarking and category analysis regulatory information notices (RINs) we issued.[95]

In response to our request, TransGrid provided further cost information (see Table A-2).

---

90 IPART was asked by the NSW Government to conduct a review into fees last published by IPART in 2005 on rental for Crown Land communication tower sites. The review was to advise the Government on any revisions or amendments to ensure the fees reflect fair market-based returns for the Government. The review also recommended principles to guide rental rates for sites considered to be of strategic or high value.

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

92 NSW Department of Trade & Investment Crown Lands, *Media Release: Telco tower rentals adjusted after IPART review*, 22 September 2014, <http://www.lpma.nsw.gov.au/__data/assets/pdf_file/0009/199008/telco_tower_rentals.pdf> accessed 30 September 2014.

93 Email, Donal O'Shea, Senior Manager Business Improvement, NSW Trade & Investment, Crown Lands, received 16 October 2014.

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

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

Table A-2 TransGrid cost basis for the 'Ongoing requirements arising from the AER's new regulatory guidelines' step change

Guideline obligation	2013-14	Step change - annual amount
Economic benchmarking RIN - labour costs	147,335 ($217.61/hr x 677 hrs)	75,670 ($216.20/hr x 350 hrs)
Economic benchmarking RIN - material costs	65,209	Nil
Economic benchmarking RIN - auditing costs	110,000	78,947
Category analysis RIN - labour costs	574,607 ($217.62/hr x 2,640.4 hrs)	295,113 ($216.20/hr x 1,365 hrs)
Category analysis RIN - material costs	259,613	Nil
Category analysis RIN - auditing costs	165,000	121,053
Shared assets RIN - labour costs	46,264 ($246.08/hr x 188 hrs)	30,268 ($216.20/hr x 140 hrs)
Shared assets RIN - material costs	38,925	Nil
Shared assets RIN - auditing costs	5,850	Nil
Total	1,412,803	601,051

Source: TransGrid, Response to Information Request PUBLIC AER TransGrid Opex 02 - Step Changes, received 18 July 2014, pp. 3–7; AER analysis.

In its submission, the Energy Market Reform Forum (EMRF) submitted that regulatory costs would have increased in 2013-14, but considers that the money sought for this work seems excessive. The EMRF noted that TransGrid's corporate and regulatory management costs were about $12 million per year from 2009-10 to 2013-14 (including $30 million of expenditure in 2013-14). It noted that despite this, TransGrid is seeking to increase average annual costs to $28 million per year, which is more than double the current regulatory period amount.[96]

The EUAA considered that there may be potential double counting of costs relating to the new regulatory requirements, considering TransGrid's already large costs under Corporate and Regulatory Management.[97]

We consider that most of the increased workload associated with the change in our Guidelines is associated with developing or changing systems to capture the information in the required format to be able to populate the RINs. We consider that this work would already have been completed, or at a minimum, the needs identification would have been undertaken in order to be able to complete the 2013–14 RINs. This means that ongoing labour requirements should be small. We acknowledge that there may be some increases in audit costs to meet the RIN requirements. These auditing costs are discussed below.

96 Energy Markets Reform Forum, *Submission to TransGrid issues paper*, July 2014, pp. 53–54.
97 Energy Users Association of Australia, *Submission to TransGrid issues paper*, August 2014, p. 11.

We note that TransGrid proposed total IT expenditure of $97 million over the five year period. This represents six per cent of TransGrid's capex. This is significantly higher than the other service providers: NSW distribution network service providers' IT capex as a share of total capex ranges between 3.5 to 4.5 per cent and for TasNetworks it is 2.5 per cent. TransGrid's 2012-13 base year opex includes $13.1 million of IT expenditure. We consider that the TransGrid capex and opex IT allowances are sufficiently large to accommodate any further system changes that may be required.

We note that:[98]

- the NSW distribution businesses did not propose a step change for the change in regulatory obligation associated with the benchmarking RIN completion
- TasNetworks proposed to absorb a step change for the increase in costs associated with the benchmarking RIN completion as an efficiency increase.

We benchmarked TransGrid's proposed costs against those of ActewAGL, Jemena Gas Networks[99] (proxying Jemena electricity network costs) and TasNetworks. TransGrid's internal labour rates were between 1.8 and 3.2 times higher than those proposed by other businesses.[100] The auditing costs proposed by TransGrid were between 1.8 and 3.3 times higher than those proposed by two of the businesses and one of the businesses proposed no additional auditing costs for the economic benchmarking and category analysis RINs. Overall, TransGrid's proposed costs were between 1.5 and 3.1 times higher than the other businesses. The three businesses did not propose any costs for completion of the shared asset RIN.

In relation to the additional costs for completing the economic benchmarking and category analysis RINs, we consider that as a larger business TransGrid should have the systems in place to better deal with the new requirements than the other smaller businesses. Applying the average of the other businesses' data as a benchmark, we consider that TransGrid's expenditure should be no higher than $266,603 per year.

In relation to TransGrid's proposed expenditure for reporting shared asset information, we consider that businesses should already be monitoring their unregulated and regulated revenues. Our shared asset guideline is explicitly designed to minimise compliance costs for network service providers such as TransGrid. We consulted network service providers extensively in developing the guideline, with a view to establishing a straightforward mechanism and least cost reporting requirements. The mechanism established by the guideline is a simple high level calculation. We consider that the cost of complying with the shared asset guideline will be negligible. This view was supported by network service providers during the guideline's development.[101] We therefore have not included any additional expenditure for TransGrid to report shared asset information with its RIN returns in our estimate.

---

98 Ausgrid, Essential Energy and Endeavour Energy did not include step changes in their revenue proposals; TasNetworks, Response to information request: AER Transend Opex 02, received 8 August 2014, p. 1.

99 Jemena Gas Networks proposed a step change for a change in regulatory obligations based on an assumption that we would implement similar benchmarking data collections for gas networks as it has done for electricity networks. It applied the costs that Jemena Electricity Networks is incurring in completing the benchmarking data requirements.

100 Jemena Gas Networks, 2015–20 Access arrangement Information Appendix 7.2, June 2014, p. 10; TasNetworks, *Tasmanian transmission revenue proposal*, 31 May 2014, p. 86.

101 Jemena, *Better regulation - Draft shared asset guidelines*, 13 September 2013, p. 1. SP AusNet, *Draft shared asset guidelines*, 13 September 2013, p. 1.

Transfer of AEMO system operator functions

We have not included TransGrid's proposed AEMO system operator functions step change in our alternative estimate of forecast total opex as the proposed expenditure is not the efficient expenditure required to carry out the functions delegated by AEMO.[102] We accept that the cost associated with carrying out the AEMO system operator functions is a step change. Consistent with our guidelines, it represents a change in obligation, whereby the costs specified in a former agreement with AEMO are now to be recovered from consumers under the new delegation which came into effect in January 2014.[103] However, we assess that the efficient cost of carrying out the AEMO system operator functions is $1.7 million (real $2013–14) over the five year regulatory period.

Notwithstanding this, our productivity forecast for TransGrid is calculated using historical opex data which includes step change expenditure. This means that included in our productivity forecast is an allowance for step changes. The amount allowed for step changes over the 2014–18 period is $7.5 million. As the amount we considered was justified by TransGrid for step changes is less than $7.5 million we have not included any additional opex for step changes in our alternative forecast.

Formerly TransGrid had an operating agreement with AEMO to carry out a number of functions relating to management of power system security. TransGrid charged AEMO annually for providing these services. The annual charge was not competitively determined, negotiated or reviewed. AEMO recovered these costs from customers as market fees.[104]

From January 2014, TransGrid's operating agreement with AEMO ceased. Instead the functions are required by AEMO 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 a step change to recover these costs from transmission customers.[105]

The EMRF don't consider that the transfer of AEMO functions is a legitimate increase in costs, because TransGrid commented that its contract with AEMO for AEMO to carry out the work is now completed. The EMRF consider that if AEMO carried out the work under contract, then the contract costs would be included in the base year. The EMRF consider that the step change claim is not legitimate as it is a task TransGrid must carry out either by contract or directly.[106] We disagree with this view. We consider that it is reasonable to expect that TransGrid is reimbursed for the cost of undertaking the management functions delegated to it by AEMO. The expenditure represents a change in the manner of cost recovery rather than a change in the quantum of costs recovered for this function.

In its submission the EUAA stated that the amount sought for the transfer of AEMO functions is based on the previous revenue stream from AEMO rather than the true incremental cost of providing the services.[107] We agree with the EUAA's view and given that the proposed costs were not and are not subject to competitive tender, we sought further information on the costs of undertaking the required functions.[108] We reviewed TransGrid's costs and we benchmarked TransGrid's cost against that of TasNetworks for undertaking the AEMO delegated functions.

---

102 NER cl. 6A.6.6(c)(1).
103 AER, *Expenditure assessment forecast guideline*, November 2013, p. 24.
104 AEMO, Schedules for Delegations, < http://www.aemo.com.au/Electricity/Policies-and-Procedures/System-Operating-Procedures/Schedules-for-Delegations> accessed 11 August 2014.
105 TransGrid, *Revenue proposal*, May 2014, p. 125.
106 Energy Markets Reform Forum, *Submission to TransGrid issues paper*, July 2014, p. 55.
107 Energy Users Association of Australia, *Submission to TransGrid issues paper*, August 2014, p. 10.
108 AER, Information request: AER TransGrid Opex 02 - Step Changes, sent 10 July 2014.

TasNetworks proposed a step change for $0.4 million per year (real $2013–14) for the change in cost recovery of AEMO delegated functions.[109] However, TasNetworks also proposed to absorb this step change as an increase in its productivity.[110] TasNetworks consequently received no allowance for the cost of carrying out the AEMO delegated functions.

The AEMO delegated functions are substantially the same for TransGrid and TasNetworks. Common across both networks is that the AEMO delegated functions are a marginal increment over the functions already required to be undertaken by the business in operating its own network. While there may be some cost differences associated with differences in network complexity and scale. We consider that the cost differences for the marginal additional work are minimal. For this reason we consider that the efficient costs required to carry out the AEMO delegated functions are those incurred by TasNetworks in 2012–13. This is a cost of $0.4 million (real $2013–14) per year.

We therefore forecast $0.4 (real $2013–14) million per year is prudent and efficient for the AEMO operating agreement step change proposed by TransGrid. However, these costs are more than offset by the lower productivity change estimate we have derived from historical data and have applied to derive our alternative forecast of total opex. This productivity change estimate is lower than what it would otherwise have been in the absence of step changes in the historical period. As a result we have not included an amount for this step change in our alternative forecast of total opex.

Easement maintenance

We have not included TransGrid's proposed easement maintenance step change in our alternative estimate of forecast total opex as we consider the expenditure to be normal variations in business as usual activities or expenditure that is captured in the price change forecast. Consistent with our Guideline, we do not consider that changes in volume or scale or the costs of discretionary changes in inputs constitute step changes.[111] In relation to price changes, we indicate in the Guideline that we consider that costs which are captured elsewhere, in this case via the rate of change, should not be counted as a step change.[112]

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.[113] TransGrid proposed that $2 million be reinstated into the base year to account for the eight months of expenditure that was not undertaken.[114] 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 includes cost increases due to a change in the work health and safety legislation, vegetation contract rates and community expectations.[115]

In its submission, the EMRF stated that it had difficulty accepting TransGrid's assertions other than that the base year costs might be lower than might have been the case. The EMRF considered that if work scheduled for the base year was not done, then rescheduling the work as late as TransGrid assert (2014–15 and 2015–16) is an unlikely proposition, because risks would increase from vegetation growing in the easement. The EMRF stated that it would expect that the uncompleted work

---

109 TasNetworks, *Tasmanian Transmission Revenue Proposal*, 31 May 2014, pp. 84–85.
110 TasNetworks, Response to information request: AER Transend Opex 02, received 8 August 2014, p. 1.
111 AER, *Expenditure assessment forecast guideline*, November 2013, p. 24.
112 AER, *Expenditure assessment forecast guideline*, November 2013, p. 24.
113 TransGrid, *Revenue proposal*, May 2014, p. 125.
114 TransGrid, *Revenue proposal*, May 2014, p. 119.
115 TransGrid, *Revenue proposal*, May 2014, p. 126.

would be rescheduled quickly. It submitted that if the work could be delayed by as much as TransGrid asserts, then the work could have been deferred anyway.[116]

We have not included TransGrid's proposed reinstatement of $2 million of easement maintenance expenditure in our alternative estimate of base opex (see section 7.4.2). We consider that delays, including those due to contract re-negotiation, creating expenditure fluctuations, are a normal part of business. It is not necessary to reinstate $2 million of easement maintenance expenditure or include a step change for catch up expenditure. Doing so would systematically overstate the efficient opex required by a prudent service provider, given the incentive regime. It would also not provide for a fair sharing of efficiency gains and losses made by TransGrid during the 2009–14 regulatory control period.

Within total opex we would expect to see variation in the composition of expenditure from year to year. That is, expenditure for some categories will be higher than usual in a given year while other categories will be lower than usual. If we were to reinstate expenditure 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. TransGrid did not propose negative step changes for cost categories where it overspent in the base year.

We therefore did not include the proportion of the step change attributed to catching up on the maintenance cycle in our alternative estimate of total opex.

We also did not include the proportion of the step change attributed to the increase in costs associated with a change in the work health and safety legislation in our alternative estimate.

The new work health and safety (WHS) laws commenced in NSW on 1 January 2012.

The change to the nationally consistent Work Health and Safety Act 2011, and associated Regulation, is expected to have had little material impact on the obligations of NSW employers.[117] This is because the previous NSW Legislation (the Occupational Health and Safety Act 2000) was already quite robust and comprehensive in its obligations on employers and employees. It is considered that some of the obligations of the new legislation were less severe, while some of the previous ambiguities in those obligations were clarified.

Transitional provisions relating to the training of WHS representatives and asbestos assessor safety management clearance certificate ended on 1 January 2013.

In the ACT, the work health and safety obligations placed on entities in the ACT have not increased since 2012–13.

We received advice that the *Work Health and Safety Act 2011* was preceded by the *Work Safety Act 2008*. The *Work Safety Act 2008* was developed to be consistent with the expected changes to be made under the national harmonisation of OHS provisions. There are no obligations under the *Work Health Safety Act 2011* that are different to or more onerous than the requirements which existed under the *Work Safety Act 2008*. The employer's duty of care to contractors has not changed since 2012–13, with the requirement to complete a Safe Work Method Statement, not changing for either employers or principal contractors from those adopted under the *Work Safety Act 2008*. The *Work*

116 Energy Markets Reform Forum, *Submission to TransGrid issues paper*, July 2014, p. 49.

117 Access Economics, *Decision Regulation Impact Statement for a Model Occupational Health and Safety Act*, 9 December 2009, pp.84-85.

Safety Act 2008 called up the National Standard for Construction Work, which required the completion of a Safe Work Method Statement for high risk construction work. The National Standard for Construction Work had the same provisions as those set out in the *Work Health Safety Act 2011*.[118]

On the basis that all transitional provisions which may potentially impact electricity network service providers terminated on 1 January 2013 (for NSW) or that there is no change in requirements (for ACT), the costs associated with these provisions should be reflected in the 2012–13 base year. Furthermore, as stated above any cost impost was expected to be minor.

We have not included the increment of the step change attributable to increased contract rates and changes in community expectations in our alternative estimate of forecast total opex. Changes in the price of contract rates are compensated through the price component of the rate of change allowance (see section B.4.2). It would therefore be double counting to also compensate the change in contract rates via a step change. We have not included an amount to account for changes in community expectations, where these expectations have not been factored into requirements on the service provider. Such expenditure is beyond what is required to maintain, in the context of the opex objectives in the NER. Changes in community expectations and businesses' response to those expectations is a normal part of business evolution. As the productivity factor captures 'average' change in factors including business practices, any cost increase is already compensated through this allowance. As indicated in our Guideline, it would therefore be overcompensating if the change in costs associated with the change in community expectations was compensated through a step change.[119]

Consumer engagement program

We have not included TransGrid's step change of $9.0 million (real $2013–14) for its proposed consumer engagement program in our alternative opex forecast. We do not consider the changed regulatory obligation regarding consumer engagement would materially increase costs above the base opex of an efficient and prudent service provider.

TransGrid is proposing to significantly expand the scope of its stakeholder engagement beyond its existing levels. It is proposing to increase its consumer engagement from its 20 direct customers to all residential and commercial electricity consumers in NSW. The proposed step change includes funding for six new staff and system upgrades to support the additional engagement. It also includes other funds to facilitate a range of initiatives including workshops, roundtables, presentations, surveys, fact sheets, social media, advertorials, brand refreshment and media training.[120]

We acknowledge 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 regulatory proposal:

- how it engaged with consumers
- how it sought to address any relevant concerns identified as a result of that engagement.[121]

However, we do not consider the changed regulatory obligation would materially increase costs above the base opex of an efficient and prudent service provider. Even without the rule change, we would

---

118 John Rees, Senior Manager, Work Safety and Industrial Relations Policy, Office of Industrial Relations, Chief Minister and Treasury Directorate, 25 June 2014, D14/82767.
119 AER, *Explanatory statement: Expenditure assessment forecast guideline*, November 2013, pp. 71-73.
120 TransGrid, *Revenue proposal*, May 2014, pp. 126–129.
121 The new NER clause relevant to ActewAGL is 6.8.2(c1)(2).

expect a prudent service provider would have programs in place to engage with consumers. For instance, we would expect that a transmission network service provider would already be engaging closely with relevant consumers as part of its reset process to help understand their preferences around prices, reliability and service standards. Indeed, TransGrid stated it was able to propose potential capex savings in direct response to its consumer engagement on its revenue proposals.[122]

This view was supported by several submissions. For instance, the CCP considered the activities listed by TransGrid as part of the step change should already be undertaken as part of normal business activities and therefore be part of the efficient revealed costs rather than a step change.[123] The EMRF considered that TransGrid should be able to accommodate the requirements of the consumer engagement guideline within the existing opex allowance; as a firm operating in a competitive environment would be required to do.[124]

In response to the CCP's submission TransGrid's noted:

> "The CCP submission notes that much of this consumer engagement activity should be part of efficient revealed cost (that is, past requirements) rather than a step change. Traditionally, TransGrid as a Transmission Service Provider has a customer relationship with fewer than 20 directly connected generation, distribution and large load customers… At the same time, as a Transmission Network Service Provider, our consumer base is state-wide, including more than 3 million household, commercial, and industrial users. We are therefore adjusting our stakeholder engagement activities from among the narrowest audience in the industry, to the broadest ".[125]

We consider 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. 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 TransGrid is proposing. We agree with the CCP which advised that most of TransGrid's consultation with smaller customers would better be done in conjunction with the NSW distribution network service providers because it would be more efficient, and because smaller customers wouldn't differentiate between distribution and transmission costs which are 'bundled' in their eyes.[126] We consider TransGrid's efficient base year opex allowance 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 regulatory proposal.

While we have concerns about the scope of TransGrid's proposed consumer engagement programs, we also have concerns about the content and nature of the engagement:

- In many cases TransGrid did not identify the specific matters on which it intends to consult and the consumers it intends to consult with on each specific matter.[127]

---

122 TransGrid, Email response to CCP advice on TransGrid's Consumer Engagement, 10 October 2014, pp. 3–4.

123 CCP, Subpanel 6, *Advice on TransGrid's proposal for step change operating expenditure on consumer engagement program*, 8 September 2014, pp. 1-2.

124 Energy Markets Reform Forum, Submission to TransGrid issues paper, July 2014, p. 56.

125 TransGrid, Email response to CCP advice on TransGrid's Consumer Engagement, 10 October 2014, p. 1.

126 CCP, Subpanel 6, *Advice on TransGrid's proposal for step change operating expenditure on consumer engagement program*, 8 September 2014, p. 2.

127 For example, the matters on which TransGrid intends to consult are not identified in the 'Consumer Advisory Panel Workshops', 'Large energy user roundtables', 'Topic specific workshops and conferences', 'Powering Sydney's Future project need consultation', 'High level project need consultation and community engagement', 'Mid level project consultation and community engagement', and 'Low level project consultation and community engagement'; TransGrid, *Revenue Proposal: Appendix S - Stakeholder Engagement Plan*, May 2014, pp. 10-14.

- TransGrid did not identify the net benefits of its engagement program. This was also noted by the EUAA which considered TransGrid should provide a more visible cost–benefit analysis of customer engagement expenditure.[128]

- Many of the proposed activities duplicate activities already undertaken by other stakeholders. Education roles are the domain of the AER and AEMO. For example, consumers wanting to understand the difference between transmission and distribution or the components of an electricity bill could be directed to our website while consumers wanting to understand how the electricity market works should be directed to the AEMO website. We also note TransGrid's proposal to produce an annual planning report, which identifies emerging constraints and needs, is already produced annually by AEMO.[129]

- Many of the proposed activities are already the subject of other consultation processes. For example, the Standing Council for Energy and Resources (SCER) has already tasked AEMO with undertaking a review of the value of customer reliability.[130] We see no reason why this work should be duplicated by TransGrid.[131]

The CCP also expressed concern about TransGrid's program. It considered it was too focussed on just informing consumers about TransGrid's proposed expenditure, not on drawing out customer preferences for expenditures. It considered TransGrid needs to engage with consumers more actively by presenting legitimate business cases, which presents competing priorities to consumers. It also needs to provide evidence of consumers' willingness to pay for their revealed preferences.[132]

Increase in demand management innovation allowance

We have not included TransGrid's proposed 'Increase in demand management innovation allowance' step change in our alternative estimate of forecast total opex. This is because the proposed expenditure is not presented as a capex/opex trade-off nor is it a result of a new regulatory obligation. Consistent with our Guideline, the proposed expenditure therefore does not constitute a step change.[133]

We note that TransGrid has an allowance of $1 million per year for demand management in its base year. We consider that the additional expenditure is not what a prudent operator would incur, faced with declining growth in peak demand. We also consider that TransGrid has spare capacity through its current period augmentation and will increase its capacity through the network capability incentive parameter action plan (NCIPAP) projects approved by the AER.

In the current regulatory period TransGrid has a $1 million per year allowance for demand management. This is included in the base year that we are rolling forward. This means that TransGrid is continuing to receive $1 million per year for demand management over the 2014–18 regulatory period.

TransGrid's proposed step change of $10.2 million over the 2014–18 period is in addition to this amount. TransGrid proposed an increase to its existing allowance for:

---

128 Energy Users Association of Australia, *Submission to TransGrid issues paper*, August 2014, pp. 10-11.
129 TransGrid, *Revenue Proposal: Appendix S - Stakeholder Engagement Plan*, May 2014, p.11.
130 AEMO, Value of Customer Reliability review, <http://www.aemo.com.au/Electricity/Planning/Value-of-Customer-Reliability-review>, accessed 17 July 2014.
131 TransGrid, *Revenue Proposal: Appendix S - Stakeholder Engagement Plan*, May 2014, p.11.
132 CCP, Subpanel 6, *Advice on TransGrid's proposal for step change operating expenditure on consumer engagement program*, 8 September 2014, pp. 1-2.
133 AER, *Expenditure forecast assessment guideline*, November 2013, p. 24.

- 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.[134]

TransGrid has not identified any capex projects that will be avoided or reduced as a result of the proposed demand management expenditure. Furthermore, unlike for distribution businesses[135], there is no rule requirement in relation to transmission service providers which requires us to consider developing and implementing a demand management innovation scheme. There has been no change in the current legislative obligations relating to demand management for transmission businesses. As such it does not meet our expectation of what constitutes a step change, as outlined in our Guideline.[136]

We consider that demand management may be developed as an alternative to undertaking network capex in order to meet network reliability requirements. However, as set out above, demand management is a capex - opex trade off, and the increased operating expenditure would need to be more than offset by reductions in capital expenditure.

TransGrid used the current period demand management allowance to:[137]

- Partner with universities to understand consumer behaviour and with distribution businesses to test demand management projects with residences and small- and medium-sized businesses, including direct control of air conditioners, peak time rebate, demand management programs with industrial and commercial customers (education and energy audits), social marketing and education, energy efficiency awareness campaigns with Endeavour Energy, energy and demand audits with Essential Energy, dynamic control of small hot water cylinders and subsidised off peak connections for electric hot water with Ausgrid.
- Developed iDemand to educate consumers about the importance of reducing peak demand and to contribute to wider demand management research.

However, we concur with the Consumer Challenge Panel (CCP) that it is not clear from TransGrid's reported findings how these measures have or will contribute to TransGrid's management of network reliability and in particular, how capex has been avoided.[138]

In addition, TransGrid has not specified how the demand management projects proposed make a direct contribution in the 2014–18 period to maintaining network reliability. In relation to this, we concur with the views expressed in the EMRF, EUAA and Origin submissions. The EMRF questions the benefit of TransGrid's proposed demand management program, and considers it should not be allowed unless there is clear benefit to consumers.[139] The EUAA consider TransGrid should provide a more visible cost–benefit analysis of increased demand management expenditure.[140] Origin questions whether the proposed increase in spending on demand management programs is appropriate, much

---

134 TransGrid, *Revenue proposal*, May 2014, pp.130–131.
135 NER cl. 6.6.3(a) provides for us to develop and publish a demand management incentive scheme for distribution network service providers.
136 AER, *Explanatory statement: Expenditure forecast assessment guideline*, November 2013, p. 51.
137 TransGrid, *Revenue proposal*, May 2014, Attachment R: Demand management innovation strategy, pp. 4, 14–15.
138 TransGrid, *Revenue proposal,* May 2014, Attachment R: Demand management innovation strategy, pp. 13–15.
139 Energy Markets Reform Forum, *Submission to TransGrid issues paper*, July 2014, p. 56.
140 Energy Users Association of Australia, *Submission to TransGrid issues paper*, August 2014, pp. 10–11.

of which is going demand management education for customers. Origin notes that a service provider's interaction is typically concentrated on large customers, who normally have a sophisticated understanding of demand management.[141]

The CCP noted that TransGrid is not proposing any actual demand reduction as a result of undertaking its proposed demand projects. The CCP observed that TransGrid's proposed demand management projects are largely directed towards residential and small business consumers. The CCP considers that the demand management expenditure would be better targeted towards directly connected customers where there are abundant demand management opportunities available. The CCP notes that this should be projects which deliver actual tangible reductions rather than projects which are focused on engagement and research.[142] In its response to the CCP advice, TransGrid stated that 'it would apply a gap analysis and value test on a project by project basis before investing, to ensure that the line of sight between the demand management innovation objectives and the project outcomes were clear, and that the project would be expected to deliver net benefits to consumers'.[143] We consider that this work should have been carried out in formulating TransGrid's proposal. We nevertheless concur with the CCP that TransGrid should be undertaking demand management projects which are targeted at directly connected customers and which will result in demand management opportunities to address specific areas of likely capacity shortfall across TransGrid's transmission network.

We also note there has been a clear change in peak demand trends since we approved a demand management allowance for TransGrid for the current regulatory period.

At this time, TransGrid's 2008 Revenue Proposal forecast annual increases in summer maximum demand of 440 MW on a base 2006–07 summer peak demand of 12,876 MW (implying an annual average growth in summer peak demand of 3.2 per cent).[144] TransGrid's energy demand forecast in 2009–10 was between 14,500 MW (low scenario), and 14,810 MW (high scenario) and in 2013-14 was forecast to be between 15,750 MW (low scenario) and 16,660 MW (high scenario).[145] We note that this is higher than the current 10 per cent forecast for 2018/19 (see Table A-3).

In actuality, the 2013-14 summer maximum demand was 12,027 MW. In contrast to the growth forecasts in the last period, this year AEMO forecast an annual average increase of the 10% POE maximum demand of 0.5 per cent over the 2013–14 to 2016–17 period.[146]

TransGrid's high maximum demand forecast at the time of the 2008 revenue proposal underpinned the capex proposed and undertaken during the current regulatory control period. Given the downwards revision in growth expectations, this indicates that there now exists a significant amount of spare network capacity.

141 Origin Energy Electricity, *Submission to TransGrid issues paper*, August 2014, pp. 2–3.
142 CCP, *Advice on TransGrid's Proposed Demand Management Innovation Allowance*, 18 September 2014, p.11.
143 TransGrid, Letter – TransGrid Comments on CCP Demand Management - 10 October 2014, p. 7.
144 TransGrid, *Revenue Proposal*, 31 May 2008, pp. 5, 14.
145 TransGrid, *Revenue Proposal*, 31 May 2008, Figure 7.6, p. 58.
146 AEMO, *National Electricity Forecasting Report 2014*, 16 June 2014, p. 4–1.

Table A-3 AEMO Summer 90%, 50% and 10% POE maximum demand forecasts for NSW (MW)

	2014-15	2015-16	2016-17	2017-18	2018-19
90% POE	11,453	11,701	11,885	12,003	12,142
50% POE	12,310	12,536	12,479	12,942	13,069
10% POE	13,438	13,725	13,985	14,112	14,328

Source: AEMO, *National Electricity Forecasting Report 2014*, Table 7, 16 June 2014, p.4-4.

In an environment of declining growth in peak demand, we consider that demand management is more appropriately targeted towards distribution network service providers. This is because distribution network service providers are best placed to manage capacity issues arising from areas of localised growth. For this reason we disagree with EnerNOC's submission which stated that TransGrid's proposals have merit because they centre on learning how to use demand response at scale, and developing markets in the necessary services.[147]

Furthermore the AER has approved $36.3 million of network capability incentive parameter action plan (NCIPAP) projects (see capex attachment 6) in applying the Service Target Performance Incentive Scheme (STPIS) to TransGrid. In its 2012 review of the transmission network service provider STPIS we introduced a separate network capability component. This was proposed to incentivise transmission service providers to increase the capability of existing network assets when most needed while maintaining adequate levels of reliability. In submitting a NCIPAP, transmission service providers are required to identify key network capability limitations on each transmission circuit or load injection point of its network. It must include a prioritised list of projects (ranked by likely benefit for customers or wholesale markets) designed to improve the network capability for some of the identified circuits or injection points. It must specify an improvement target for these projects. The total average expenditure of the proposed priority projects must not exceed one per cent of the average MAR in a service provider's revenue proposal. The project must result in a material benefit and must be achieved in the regulatory control period.[148]

We consider that TransGrid's network has available spare capacity, created by:

- the augmentation undertaken during the current period
- the NCIPAP projects, which AEMO endorsed and we approved.

Hence, as the proposed expenditure is not presented as a capex/opex trade-off nor is it a result of a new regulatory obligation, the proposed expenditure does not constitute a step change. Furthermore, we note that:

- TransGrid has existing spare capacity and that the AER has approved $36.3 million of NCIPAP projects which will further increase its spare capacity
- there has been a change in demand conditions

147 EnerNOC, *Submission to TransGrid issues paper*, August 2014, p. 2.
148 AER, *Final Decision - TNSP Service Target Performance Incentive Scheme, Version 4*, 19 December 2012, pp. 23, 26–29.

- TransGrid has an allowance of $1 million per year for demand management in its base year.

Revenue reset

We have not included TransGrid's proposed 'Revenue reset' step change in our alternative estimate of forecast total opex as we consider that an adjustment for the variation in expenditure is likely to result in an overstatement of efficient opex.

TransGrid proposed a step change for the costs associated with preparing its revenue proposal and responding to our assessment of it. TransGrid submits that the expenditure was forecast relative to that incurred in the 2012–13 base year. It submits that the forecast costs are higher than in the base year due to the change in information requirements associated with completing the revenue reset RIN.[149]

The EMRF considers the claim for increased revenue reset activities does not reflect a step change as these costs are already in the base year.[150]

We agree with EMRF's submission. Expenditure for the purposes of preparing a revenue proposal is a business as usual expense. It is not a change in expenditure which is attributable to a change in the business' operating environment or in a legislative or regulatory obligation. We consider that the base year provides the most reliable forecast of recurrent opex, including expenditure for the preparation of TransGrid's revenue proposal.

We would expect to see variation in the composition of expenditure from year to year within total opex. While total opex is recurrent, opex for a given category may vary significantly from year to year. The greater the level of disaggregation the more we are likely to see this. If we were to provide step changes for cost categories where opex is lower in the base year, but did not do the same for categories where opex was higher, we would overstate the efficient opex required by a prudent service provider. As noted above, TransGrid did not propose negative step changes for cost categories where expenditure was higher in the base year. If total opex is recurrent, step changes for non-recurrent cost categories are not required since the positive step changes will be offset by the negative step changes.

149 TransGrid, *Revenue proposal*, May 2014, p.131.
150 Energy Markets Reform Forum, *Submission to TransGrid issues paper*, July 2014, p. 56.

B 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 efficient opex for each year of a regulatory control period might differ from expenditure in the base year.

As set out in our Guideline, we have developed an opex forecast incorporating the rate of change to account for the following factors:[151]

- price change[152]
- output change
- productivity change

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

We add any other changes in opex over the regulatory control period (that are not compensated either in base opex or our rate of change) as step changes. Position

B.1 Position

TransGrid's rate of change in the first year of the forecast period is lower than ours and higher in the last four years of the forecast period. Overall our forecast of the rate of change is lower than TransGrid's over the forecast period. Table B-1 compares TransGrid's and our overall rate of change in percentage terms for the 2014–19 period.

The differences in each forecast rate of change component are:

- our forecast of price change is on average 0.48 percentage points lower than TransGrid's
- our forecast of output change is on average 0.16 percentage points lower than TransGrid's,
- our forecast of productivity is 0.48 percentage points higher than TransGrid's.

Our rate of change assessment methodology and the reasons for taking this position are discussed in the sections below.

Table B-1 TransGrid and AER rate of change (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid	0.60	1.09	2.39	2.01
AER	0.94	0.05	0.09	0.54
Difference	0.34	–1.04	–2.30	–1.47

Source: AER analysis

[151] AER, *Explanatory statement: Expenditure forecast assessment guideline*, November 2013, pp. 65–66.

[152] We note the guidelines referred to price growth, output growth and productivity growth. We have changed the term growth to change to reflect that these components can be either positive or negative.

B.2 TransGrid's proposal

TransGrid used a different methodology to form its view about the opex rate of change than the methodology set out in our Guidelines. However they did quantify the portion of their forecast opex that was attributable to price changes, output change, and productivity change. This is shown in Table B-2.

Table B-2 TransGrid's proposed opex by rate of change drivers ($000 2013–14)

	2014–15	2015–16	2016–17	2017–18
Base opex[153]	164 919.0	169 764.8	171 375.0	162 361.2
Price change (cumulative)	–163.9	1,806.4	4,653.3	7,717.2
Output change (cumulative)	3,228.6	5,163.7	6,549.1	6,926.5
Productivity change (cumulative)	–1,053.7	–3,060.9	–3,127.9	–3,145.7

Source: TransGrid's reset RIN.

Each of TransGrid's proposed rate of change components is discussed below.

Forecast price change

TransGrid's forecast price change includes price changes for labour, non-labour and insurance costs.

For its internal labour, TransGrid proposed the use of its employee agreement until 1 December 2016.[154] For all external labour and internal labour following the end of its employee agreement, TransGrid proposed the Wage Price Index (WPI) for the Electricity, Gas, Water and Waste Services (EGWWS) sector in New South Wales forecast by BIS Shrapnel.[155]

TransGrid considered the average weekly ordinary time earnings (AWOTE) to more closely reflect its actual labour costs but proposed the use of WPI because it was our preferred measure of labour.[156]

TransGrid proposed CPI for cost increases for its non-labour proportion of opex which is made up of materials. This is consistent with its previous in the 2009–10 to 2013–14 revenue proposal.[157]

TransGrid also included changes to its insurance premiums as a part of its price changes. It developed its forecast of these changes using advice from its consultant, Marsh.[158]

---

153 Base opex should be constant over the period. However, TransGrid has not use a pure base year forecasting approach, and as a result has derived the base year as a residual from its forecast.
154 TransGrid, *Revenue proposal*, May 2014, pp. 79, 137.
155 TransGrid, *Revenue proposal*, May 2014, pp. 79, 137.
156 TransGrid, *Revenue proposal*, May 2014, p. 79.
157 TransGrid, *Revenue proposal*, May 2014l, p. 138.
158 TransGrid, *Revenue proposal*, May 2014, Appendix T, Marsh, Insurance and self insurance market estimate.

Forecast output change

TransGrid proposed expenditure for growth in the size of its network. This accounts for the maintenance of new network elements in the forecast 2014–18 period. TransGrid's formula for network growth is calculated as:

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

TransGrid has also applied an economies of scale adjustment to its network growth. [159]

Forecast productivity change

TransGrid included economies of scale as a part of its output change rather than productivity change in Table B-2. TransGrid also considered that productivity should be limited to efficiencies that are exogenous to the business and do not derive from management effort.[160]

TransGrid further noted:

> In developing and implementing the EBSS, we must have regard to the desirability of both rewarding TNSPs for efficiency gains and penalising TNSPs for efficiency losses.[161]

Since we are assessing the overall rate of change, we did not reallocate TransGrid's economies of scale adjustment to productivity.

Rate of change

The rate of change approach applies a percentage change to the previous year's opex. TransGrid's proposed rate of change drivers in Table B-3 express the impact of each rate of change component in dollar terms.

To allow for a like with like comparison, we have expressed each of TransGrid's rate of change components in annual percentage terms below in Table B-3. Since a rate of change driver such as price change is made up of various escalators, such as labour and non-labour. Our conversion from a dollar figure impact to a percentage impact is the equivalent of applying a weighted average of all the escalations used in the price change measure.

---

159 TransGrid, *Revenue proposal*, May 2014, pp. 138, 141.
160 TransGrid, *Revenue proposal*, May 2014, p. 137.
161 TransGrid, *Revenue proposal*, May 2014, p. 137.

Table B-3 TransGrid's opex rate of change (per cent)[162]

	2014–15[163]	2015–16	2016–17	2017–8
Price change	–0.05	1.15	1.62	1.80
Output change	0.97	1.13	0.79	0.22
Productivity change	0.32	1.17	0.04	0.01
Total rate of change	0.60	1.09	2.39	2.01

Source: TransGrid's reset RIN, AER analysis.

B.3 Assessment approach

As discussed above, our assessment of the annual change in expenditure is made in the context of our assessment of TransGrid's proposed total forecast opex.

The rate of change itself is a build-up of various components to provide an overall holistic number that represents our forecast of annual change in overall opex during the 2014–18 period. We consider the rate of change approach captures all drivers of changes in efficient base opex except for material differences between historic and forecast step changes. The rate of change approach takes into account inputs and outputs, and how well the service provider utilises these inputs and outputs.

The rate of change formula for opex is:

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

Where Δ denotes the proportional change in a variable.

Our starting point for assessing the service provider's proposed change in annual expenditure is to disaggregate the service provider's proposal into the three rate of change components. This enables us to identify where there are differences in our estimate and the service provider's estimate of the components of the rate of change. While individual components in the service provider's proposed annual change in expenditure may differ from our rate of change component forecasts, we will form a view on the overall rate of change in deciding what to apply to derive our alternative opex forecast.

We also take into account whether the differences in the rate of change components are a result of differences in allocation or methodology. For example, a service provider may allocate economies of scale to the output change component of the rate of change, whereas we consider this to be a productivity change. Irrespective of how a service provider has built up or categorised the components of its forecast rate of change, our assessment approach considers all the relevant drivers of the opex rate of change.

---

[162] To calculate the rate of change, we took the annual change in each rate of change component in **Error! Reference ource not found.** as a percentage of the current year's base opex plus the previous year's rate of change components. For example the output change for 2015/16 is equal to the difference between 2015/16 output change and 2014/15 output change divided by base opex in 2015/16 and the sum of the rate of change from 2014/15. This ensures that the incremental change from each rate of change component is calculated as a percentage of base opex and previous years rate of change.

[163] We took the square root of the growth between 2012/13 and 2014/15 to obtain a one year annualised rate of change for 2014/15.

Since our rate of change approach is a holistic approach we cannot make adjustments to one component without considering the interactions with other rate of change components. For example, if we were to the adjust output to take into account economies of scale, we must ensure that economies of scale have not already been accounted for in our productivity change forecast. Otherwise, this will double count the effect of economies of scale.

Price change

Under our rate of change approach we escalate opex by the forecast change in prices. The price change is made up of labour price changes and non-labour (which includes materials) price changes. 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.

To determine the appropriate forecast change in labour prices we have assessed forecasts from Independent Economics, BIS Shrapnel and Deloitte Access Economics. These forecasts are based on the consultants' view of general macroeconomics trends for the utilities industry and the overall Australian economy. Our consideration of the choice of labour price forecast is discussed in section B.4.2.

Output change

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

Under our rate of change approach, a proportional change in output results in the same proportional change in expenditure. For example, if the only output measure is maximum demand, a 10 per cent increase in maximum demand results in a 10 per cent increase in expenditure. Any subsequent adjustment for economies of scale is considered as a part of productivity.

To measure output change, we select a set of output measures and apply a weighting to these measures. We have chosen the same output change measures and weightings as used in our multilateral total factor productivity (MTFP) analysis. This ensures output change is measured consistently through time and across transmission network service providers.

The historical output change for Essential Energy has been obtained from our Economic Benchmarking RIN. The Economic Benchmarking RIN provides a consistent basis to benchmark the inputs and outputs of each service provider. This allows us to consistently compare the change in output overtime and across service providers.

The forecast output change has been calculated based on forecasts obtained from the reset RIN which have been prepared on the same basis as the Economic Benchmarking RIN.

More information on how we have estimated output change is discussed in section B.4.3.

Productivity change

The 'productivity change' measure is based on the service provider's historical productivity changes in using its inputs to produce outputs. Our change in productivity measure is based on the electricity

transmission industry's historical productivity changes in producing outputs over its inputs. Our forecast productivity is based on the historical MPFP results estimated by Economic Insights.[164]

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

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

If inputs increase at a greater rate than outputs then a service provider's productivity is decreasing. Changes in productivity can have different sources. For example, changes in productivity may be due to the realisation of economies of scale or technical change, such as the adoption of new technologies. We expect efficient service providers to pursue productivity improvements over time.

More information on how productivity has been estimated is discussed below in section B.4.4.

Other considerations

Interaction with our base opex and step changes

As noted above, the rate of change approach is used in conjunction with our assessment of efficient base opex and step changes to determine total opex. We cannot make adjustments to base opex and step changes without also considering its effect on the opex rate of change, and, in particular, productivity.

For example, if we adjust an inefficient service provider's base opex to that of an efficient service provider we must also set the productivity to reflect an efficient service provider's productivity.

This interrelationship is also important for our step change assessment. Our forecast rate of change is influenced by historical data. Our measured productivity will include the effect of past step changes which typically increase a service provider's inputs. This will lower our measured productivity. If we include an allowance for step changes in forecast opex, there is a risk that a service provider will be compensated twice for step changes.[165]

Comparison with our previous cost escalation approach

Under our previous approach to setting the trend in opex, we assessed real cost escalations (this is similar to price change) and output change separately. Any productivity changes were assessed based on labour productivity for real cost escalations and economies of scale for output change.

This approach is less robust than our opex rate of change approach because accounting for both labour productivity and economies of scale separately could result in double counting productivity effects.

In practice, this meant that we could either apply labour productivity or economies of scale but not both. In our recent determinations we applied an adjustment for economies of scale rather than labour productivity because economies of scale estimates were more robust than labour productivity

---

[164] Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 6 November 2014, p. 2.

[165] Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 6 November 2014, pp. 17–18.

estimates. However, we noted this approach did not account for all productivity changes and that a single productivity measure would be more accurate.[166]

B.4 Reasons for position

To provide greater detail on how we have estimated our forecast rate of change, the sections below have been separated into the three main rate of change components. Where relevant these components have been compared to TransGrid's rate of change using information provided in the reset RIN.

B.4.1 Overall rate of change

The difference between TransGrid's rate of change and our rate of change is one of the reasons why we consider TransGrid's forecast total opex does not reflect the opex criteria. Table B-4 compares our overall rate of change to TransGrid's.

Table B-4 AER and TransGrid's overall rate of change (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid				
Price change	–0.05	1.15	1.62	1.80
Output change	0.97	1.13	0.79	0.22
Productivity change	0.32	1.17	0.04	0.01
Overall rate of change	**0.60**	**1.09**	**2.39**	**2.01**
AER				
Price change	0.49	0.47	0.76	0.89
Output change	1.31	0.45	0.20	0.52
Productivity change	0.86	0.86	0.86	0.86
Overall rate of change	**0.94**	**0.05**	**0.09**	**0.54**
Difference	**0.34**	**–1.04**	**–2.30**	**–1.47**

As noted in our assessment approach, we compared TransGrid's overall rate of change with our forecast rate of change. Although the individual rate of change components differ between the two forecasts, the overall rate of change for 2014–15 is similar. From 2015–16 onwards, TransGrid's rate of change is higher than ours. This is driven by differences in all three rate of change components.

Specifically the differences from 2015–16 onwards is driven by:

- The use of BIS Shrapnel labour forecast which are higher than ours which is based on an average of BIS Shrapnel and DAE.

[166] AER, *Final decision SP AusNet Transmission Determination 2014–15 to 2016–17*, January 2014, pp. 64–65.

- TransGrid's higher forecast output change which is calculated based on a function of its forecast capex. Our approach is based on TransGrid's outputs used in our MTFP analysis.
- We note TransGrid's forecast output change includes economies of scale and is still higher than our forecast output change which does not includes economies of scale which we included in our productivity assessment.
- TransGrid's forecast productivity change component is lower than ours. TransGrid's forecast productivity is a bottom up build of negative step changes. TransGrid's has included economies of scale, but has incorporated this into forecast output change.
- Our forecast of productivity is based on the historical electricity transmission industry productivity; this assumes that the electricity transmission industry's use of inputs to produce outputs in the previous eight years is an appropriate forecast of the productivity it can achieve for the forecast period. This results in our productivity forecast being higher than TransGrid's proposed productivity over the forecast period.

B.4.2 Price change

For the forecast opex price changes we adopted a 62 per cent weighting for labour price and 38 per cent non-labour. Our forecast for the labour price change is based on forecasts of the Electricity, Gas, Water and Waste services (EGWWS) industry and our forecast for non-labour price change is the CPI. Table B-5 shows TransGrid's proposed forecast price change and our price change.

TransGrid also included the forecast price changes for insurance; we included this in base opex.

Table B-5 AER and TransGrid's forecast price change (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid's forecast price change	–0.05	1.15	1.62	1.80
AER forecast price change	0.49	0.47	0.76	0.89

Source: TransGrid reset RIN, TransGrid response to information request opex 03 and 04 and AER analysis.

The sections below discuss how we forecast prices and how it compares to TransGrid's approach.

Opex price weightings

The forecast price change is weighted by the proportion of opex that is labour and non-labour. Since opex is not comprised entirely of labour costs, it would not be appropriate to adjust opex by only labour prices.

We adopted a 62 per cent weighting for labour and 38 per cent for non-labour in forecasting price changes. The labour component is forecast based on the EGWWS industry and the non-labour component is forecast based on the consumer price index (CPI).

These weightings are broadly consistent with Economic Insight's benchmarking analysis which applied weight of 62 per cent EGWWS wage price index (WPI) for labour and 38 per cent for five

producer price indexes (PPIs) for non-labour. The five PPI's cover business, computing, secretarial, legal and accounting, and public relations services.[167]

TransGrid proposed different weightings between materials, which is escalated by CPI, and labour for each of its opex categories. At the overall opex level there is no material difference between TransGrid's opex weightings and our opex weightings.

Forecast of producer price indices and CPI

For the purposes of forecasting we have applied the forecast CPI rather than forecasts for each PPI. We recognise that the use of PPI's for historical purposes and CPI for forecasts may be inconsistent. However, sensitivity analysis from Economic Insights showed there to be no material difference between using the CPI or PPI in the economic benchmarking results. This is because the change in PPI's follows a similar trend to the change in CPI.[168]

To forecast CPI we adopt the Reserve Bank of Australia's (RBA's) Statement of Monetary Policy and for the years beyond that we apply the mid-point of the RBA's target band. We consider forecasts of the CPI to be more robust than forecasts of the PPI's because the CPI is a more aggregated measure and forecasts of the CPI are more readily available. Further the CPI is subject to the RBA's Statement of Monetary Policy's target band which provides a more robust basis for economists to produce their forecasts. For this reason we have used forecast CPI, rather than PPI's, to forecast the non-labour component of price changes. Economic Insights noted that while the use of these PPIs is likely to be more accurate for historic analysis, it is unlikely to be practical for applications requiring forecasts of the opex price index such as the rate of change. This is because it is very difficult to obtain price forecasts at a finely disaggregated level other than by simple extrapolation of past trends.[169]

If the forecasts of the five PPI's can be forecast with similar accuracy to the CPI, then we would consider the five PPI's to also be an appropriate opex price deflator. However, at this stage we do not consider robust forecasts of the five PPI's are available.

Labour price change

Our choice of the labour price measure seeks to select the efficient labour price for an efficient service provider on the opex frontier. To determine the efficient labour price we require a forecast of the benchmark labour price. We consider forecasts of the EGWWS industry, produced by expert forecasters, to be an appropriate benchmark for TransGrid's labour price. This is because the EGWWS classification includes labour in the electricity industry and provides a benchmark labour price for comparable staff within the utilities industry. Since TransGrid's labour is classified within the EGWWS, this provides a reasonable comparison with similar labour.

We note the main difference between our labour price forecast and TransGrid's is the use of TransGrid's enterprise agreement and BIS Shrapnel's labour forecasts for the years without an enterprise agreement.

The section below discusses in detail our position on the choice of labour forecast, the use of enterprise agreements and adjusting for labour productivity.

---

167 Economic Insights, *Measurement of Inputs for Economic Benchmarking of Electricity Network Service Providers*, 22 April 2013, p. 4.

168 Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 6 November 2014, p. 10.

169 Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 6 November 2014, p. 10.

Choice of labour forecast

To forecast labour we adopted the average of Deloitte Access Economics (DAE) and BIS Shrapnel's wage price index (WPI) forecasts for the EGWWS sector.

We consider an averaging approach that takes into account the consultant's forecasting history, if available, to be the best method for selecting the labour price.

This is based on our previous analysis[170] which was corroborated by Professor Borland's analysis.[171] When considering appropriate labour price change forecasts for the SP AusNet gas distribution network we adopted an average of the forecasts prepared by DAE and BIS Shrapnel. We took this approach DAE typically forecast lower than actual WPI and BIS Shrapnel typically forecast higher than actual WPI for the Australian EGWWS sector.

Previous analysis by DAE and the AER showed that DAE's forecasts were too pessimistic at the national level. In contrast BIS Shrapnel's were too optimistic and by a greater margin.[172]

We compared both DAE and BIS Shrapnel's forecasts for the NSW EGWWS industry. These forecasts are shown in Table B-6. Both TransGrid and Jemena Gas Networks (JGN) commissioned BIS Shrapnel to provide forecasts of the NSW EGWWS industry.

Since JGN's BIS Shrapnel report is dated April 2014[173] and TransGrid's BIS Shrapnel report is dated November 2013[174] we used BIS Shrapnel's labour forecasts from JGN's report. We consider the newer report reflects more recent ABS data which should lead to a more robust forecast of NSW EGWWS labour for 2014–15 to 2017–18.

Table B-6 Comparison of consultant labour forecasts for NSW EGWWS industry (per cent)

	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20	Average
Nominal								
Deloitte	3.20	3.30	2.90	3.40	3.50	3.30	3.30	3.27
BIS Shrapnel	3.60	3.40	3.70	4.20	4.50	4.70	4.80	4.13
Real								
Deloitte	0.60	0.60	0.40	0.50	1.00	0.90	1.00	0.71
BIS Shrapnel	0.80	0.60	1.20	1.70	2.00	2.20	2.30	1.54
CPI								
Deloitte	2.70	2.50	2.50	2.90	2.50	2.40	2.40	2.56
BIS Shrapnel	2.80	2.80	2.50	2.50	2.50	2.50	2.50	2.59

Source: BIS Shrapnel, Deloitte Access Economies and AER analysis.

170 AER, *Access arrangement final decision SPI Networks (Gas) Pty Ltd 2013–17 – Part 3: appendices*, March 2013, p. 7.
171 AER, *Access arrangement final decision SPI Networks (Gas) Pty Ltd 2013–17 – Part 3: appendices*, March 2013, pp. 9–11.
172 AER, *Powerlink Final decision*, April 2012, p. 5.
173 BIS Shrapnel, *Real labour and material cost escalation forecasts to 2019/20 – Australia and New South Wales*, April 2014.
174 BIS Shrapnel, *Real labour cost escalation forecasts to 2018/19 – Australia and New South Wales*, November 2013.

As can be seen in Table B-6 the historical trend of BIS Shrapnel forecasting lower than DAE has continued for the 2013–14 to 2019–20 period. We note the Australia wide EGWWS for 2013–14 was 3.04 per cent in nominal terms[175] and CPI was 3.02 per cent for the same period.[176] This results in a 0.02 per cent real increase in national EGWWS labour. Both consultant forecasts for 2013–14 EGWWS labour are higher than the ABS' actual figures.

The Major Energy Users (MEU) noted forecasts by DAE and BIS Shrapnel typically overestimate the WPI and that we do not assess the actual accuracy of the forecasts over time.[177]

We assessed the forecasting performance of both DAE and BIS Shrapnel. As noted above, we found that DAE typically forecasts below the actual WPI and BIS Shrapnel forecasts above and we addressed this issue by averaging consultant forecasts.

The Consumer Challenge Panel noted TransGrid should not be claiming labour price pressures in excess of CPI because the industry is in contraction due to declining demand for its services.[178] Origin noted several factors that imply a period of growth in wages below long term averages. This included the downward pressure on the electricity utilities sector in NSW due to the sustained campaign of redundancy for the three NSW distribution network service providers.

We consider the consultants should take the recent ABS data into account when providing updated forecasts. Based on the expert opinion of DAE and BIS Shrapnel, labour prices are forecast to increase at a greater rate than CPI over the forecast period. This is based on DAE and BIS Shrapnel's forecasting methodologies. While we cannot assess the consultants' models, we consider the updated forecasts should reflect current expectations of the forecast period.

We note labour price forecasts are likely to change prior to the final decision to reflect the most up to date data.

Use of enterprise bargaining agreements

We did not adopt TransGrid's enterprise bargaining agreement (EBA) in our price change component.

As noted above, our alternative estimate is based on setting base opex and rate of change for an efficient service provider rather than the service provider's actual costs.

EBAs do not necessarily only reflect the labour price. For example a service provider may negotiate a lower increase in salary but change redundancy provisions. This may result in a lower price increase but may also affect the quantity of labour a service provider employs which will impact its labour productivity. This means EBAs can include both a labour price and productivity component.

We accounted for productivity as a separate component of the opex rate of change. If we were to adopt a service provider's EBA as the labour price and then adjust for productivity separately this could potentially result in double counting of productivity effects. The rate of change approach has been developed to ensure that productivity can be accounted for explicitly without the risk of double counting productivity.

---

175 ABS, 6345.0 - Wage Price Index, Australia, Table 9b. Ordinary Hourly Rates of Pay Excluding Bonuses: Sector by Industry, Original (Quarterly Index Numbers), 12 August 2014

176 ABS, 6401.0 - Consumer Price Index, Australia, Tables 3 and 4. CPI: Groups, Weighted Average of Eight Capital Cities, Index Numbers and Percentage Changes, 22 July 2014

177 Major Energy Users, *Tasmanian Electricity Transmission Revenue Reset A response by the Major Energy Users Inc.*, August 2014, p. 28.

178 Consumer Challenge Panel, *AER Consumer Challenge Panel (CCP6 sub panel) submission on the TransGrid Revenue Proposal*, 8 August 2014, p. 11.

Also an EBA may result in a deviation from the forecast industry average if it is adopted at the beginning of the period and a forecast industry average is used following the end of the current enterprise agreement. For example, if early in the period a service provider has a lower EBA than the average, then there may be an expectation for its next EBA to be higher than average.

It is not symmetrical to apply an EBA for some years and then a consultant's forecast for the remaining years without considering the salary level. For example, if a service provider negotiates a lower EBA in the current period than other service providers', assuming the other provisions are equal, then it may be reasonable to expect a higher EBA in the next period to "catch up" to other service providers. Applying a benchmark labour price following the end of an EBA would not recognise this catch up.

TransGrid proposed the use of its enterprise bargaining agreement for the first two years of its labour cost escalations.[179] The wage increases in its enterprise bargaining agreement are lower than BIS Shrapnel's labour forecasts. TransGrid's opex forecasts include forecast labour price increases of for its internal labour of –0.25 per cent and 0.12 per cent for the first and second years respectively. This compares to our forecasts of 0.60 per cent and 0.80 per cent for EGWWS labour.

However, TransGrid's forecasts for the last two years, from BIS Shrapnel, are 1.70 per cent and 2.00 per cent compared to our forecast, based on the average of BIS Shrapnel and DAE, is 1.1 per cent and 1.5 per cent.

The Consumer Challenge Panel submitted that:

> We must ensure that the electricity networks do not continue with their previous approach of effectively treating EBA outcomes as a "pass through". We need to determine efficient allowances for labour costs that better reflect the long-term interests of consumers.[180]

The MEU also submitted that adjusting costs that have been negotiated by a single firm does not necessarily reflect an efficient outcome.[181]

As noted above we did not adopt TransGrid's EBA in our rate of change. Our labour price is based on the forecast of the NSW EGWWS industry which we consider to be a benchmark appropriate for an efficient service provider.

Labour productivity

Our preferred approach to productivity is adopt an overall service provider specific productivity adjustment rather than adjusting the forecast EGWWS labour price change for EGWWS labour productivity.

The use of service provider specific productivity rather than EGWWS wide productivity is supported by Independent Economics which noted:[182]

> There are significant difficulties in measuring productivity in the utilities sector generally and the electricity distribution sector in particular. Hence, it is suggested adjusting for productivity is better undertaken on the basis of a detailed assessment of specific sources of productivity gains within the industry rather than attempting to infer productivity gains using the broader data published by the ABS.

---

179 TransGrid, *Revenue proposal 2014/15 – 2018/19*, June 2014, p. 137.
180 Consumer Challenge Panel, *AER Consumer Challenge Panel (CCP6 Sub Panel) submission on the TransGrid revenue proposal*, 8 August 2014, p. 11.
181 Major Energy Users, *Tasmanian Electricity Transmission Revenue Reset A response by the Major Energy Users Inc.*, August 2014, p. 25.
182 Independent Economics, *Labour cost escalators for NSW, the ACT and Tasmania*, 18 February 2014, p. 6.

Since the data for a service provider specific productivity measure is available from our MTFP analysis and this is preferred over an EGWWS labour productivity adjustment, we have applied a service provider specific measure.

Further discussion on how we accounted for productivity is discussed below in section B.4.4.

B.4.3 Output change

We are not satisfied that TransGrid's proposed output change methodology reasonably reflects the output change that an efficient service provider would incur. We have based our estimate of the relationship between output change and opex on the approach developed by our consultant Economic Insights. We consider that the approach applied by Economic Insights is preferential to the approach proposed by TransGrid. Economic Insights links opex change to output growth whereas TransGrid assumes that the growth in its opex is linked to the growth in its asset base.

Economic Insights uses an index based number approach to estimating the rate of change for opex. As noted by Economic Insights, this approach is simple and robust, is readily reproducible and has a rigorous grounding in economic theory.[183]

Economic Insights has used a Translog function to measure the cost elasticity for each of the outputs. We have used Economic Insights' measure of the cost elasticities of the outputs to estimate the rate of change.

The outputs and cost elasticities are as follows:[184]

- Energy delivered – 21.4 per cent
- Ratcheted maximum demand – 22.1 per cent
- Weighted entry and exit connection points – 27.8 per cent
- Circuit length – 28.7 per cent

The outputs chosen by Economic Insights were based the three selection criteria that we set out in our explanatory statement to the expenditure forecast assessment guideline.[185] As such, the outputs align with the NEL and NER objectives, reflect services provided to customers and are significant.[186]

The process for selecting outputs was informed by the consultation process for our Better Regulation Guidelines, where the AER conducted a number of workshops on measuring productivity for transmission network service providers. Two of these workshops focussed on selecting and measuring the appropriate outputs for a transmission network.[187]

As a result of these workshops, Economic Insights arrived at a preferred output specification that included energy throughput, system capacity, entry and exit points and reliability. To address concerns about the multiplicative nature of system capacity, Economic Insights adopted the use of

---

183 Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 6 November 2014, pp. 4–6.

184 Since reliability is not forecast to change as a part of the rate of change approach it receives a weighting of zero for the forecast period.

185 Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and Tasmanian Electricity TNSPs, Report prepared for Australian Energy Regulator*, 6 November 2014, p. 7.

186 AER, Better Regulation: *Explanatory Statement – Expenditure Forecast Assessment Guideline*, November 2013, p. 145.

187 The information papers, presentations and summary of the workshops are available at http://www.aer.gov.au/node/19487.

ratcheted maximum demand and circuit length. The use of ratcheted maximum demand addressed stakeholder concerns about the use of installed transformer capacity providing credit for excess capacity being delivered, while at the same time providing the transmission network service provider credit for capacity it had been required to provide to meet previous maximum demands.[188]

Strictly speaking, TransGrid has not linked the growth in its opex to growth in its outputs. Rather, TransGrid proposed to escalate its opex by expenditure for growth in the size of its network. TransGrid's formula for network growth is calculated as:

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

TransGrid's network size measure relies upon its assumptions of forecast price changes, the approach taken to estimate the replacement value of its network and its required capital (which in turn relies upon TransGrid's forecast of output growth). We consider that Economic Insight's approach is preferential because it is more directly linked to changes in output than TransGrid's indirect measure.

A change in the value of capital inputs does not necessarily result in a change in opex. For example, TransGrid included price changes for property, which appears to be closely related to the asset growth rate for land and easements. We do not consider an increase in residential and rural property prices, which appears to be a key component of TransGrid's land and easements asset growth, should increase the quantity of opex related to land and easements.

TransGrid's output change also includes an economies of scale adjustment to reflect that an increase in network size will not result in a one-for-one increase in opex.[189] In our previous determination for TransGrid we accepted this approach. However, we consider that Economic Insights' multilateral partial factor productivity (MPFP) forecasts provide a better basis for the estimation of economies of scale. Economic Insights estimates the MPFP for opex based upon the revealed performance of Australian transmission service providers. Further, TransGrid's proposed economies of scale are individually applied to components of opex. However, Economic Insights' MPFP applied to the whole of opex and as such does not rely upon assumptions regarding the composition of opex going forward or the specific economy of scale factor to be applied to a component of opex.

Further, our approach does not rely upon a service provider's forecast capex which can change significantly from year to year. For example, a service provider may decide to put in additional investment to meet an increase in throughput ten years from now. This may require a substantial up front capex investment and lower capex in the future.

Our focus on the outputs as a driver of opex costs rather than asset growth is consistent with our overall rate of change approach which considers opex as a whole. We have selected our outputs based on those what we consider to be the outputs a service provider must meet to service its customers. Economic Insights noted that this output specification has been adopted recently by Pacific Economics Group Research (PEGR) and performed well against the selection criteria. This is because it recognises key aspects of the expenditure objectives by including both energy throughput

---

188 Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 6 November 2014, pp. 8–9.

189 TransGrid, *Revenue proposal 2014/15 – 2018/19*, June 2014, pp. 138, 141.

and maximum demand. It also reflects the range of services provided by customers and covers the most significant outputs.[190]

More information on the process for selecting outputs is available in Economic Insights' report.

Table B-7 shows the annual percentage change in our forecast output change and TransGrid's forecast output change.

Table B-7 AER and TransGrid's forecast output change (per cent)

	2014–15	2015–16	2016–17	2017–18
TransGrid's forecast output change	0.97	1.13	0.79	0.22
AER forecast output change	1.31	0.45	0.20	0.52

Source: TransGrid reset RIN and AER analysis.

B.4.4 Productivity

We adopted the electricity transmission industry average opex partial productivity growth rate of 0.86 per cent from 2006–13 to forecast TransGrid's opex productivity. This is based on Economic Insights' recommendation to use the historical opex partial productivity growth rates in the absence of a sufficiently robust econometric opex cost function.[191]

In our Forecast Expenditure Guidelines we noted that we would apply a rate of change, to estimated final year opex (taking into account an efficiency adjustment, if required), to account for the shift in the productivity frontier.[192]

Since forecast opex must reflect the efficient costs of a prudent firm, it must reflect the productivity improvements it is reasonable to expect a prudent service provider can achieve. All else equal, a price taker in a competitive market will maintain constant profits if it matches the industry average productivity improvements reflect in the market price. If it is able to make further productivity improvements, it will be able to increase its profits until the rest of the industry catches up, and this is reflected in the market price. Similarly, if a service provider is able to improve productivity beyond that forecast, it is able to retain those efficiency gains for a period through the EBSS.

Our productivity estimate is based on a business as usual scenario. This assumes that there will be no significant structural change in the electricity transmission industry for the 2014–18 period relative to 2006–13.

Economic Insights considered the extrapolation of the electricity transmission industry opex partial productivity growth rate to be reasonable in a 'business as usual' scenario. Our industry wide forecast of productivity is close to what TransGrid has achieved in the past.

Further, our alternative estimate does not include any significant departures from TransGrid's historical performance. We consider the use of historical productivity to be reasonable in the absence of a robust opex cost function. Economic Insights noted that the historical opex partial productivity growth rates will provide a reasonable approximation of the opex cost function.

---

190 Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 6 November 2014, p. 9.

191 Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 6 November 2014, p. 18.

192 AER, *Explanatory statement: Expenditure forecast assessment guideline*, November 2013, p. 65.

A robust opex cost function, if available, will allow us to separate out the different productivity effects such as economies of scale and frontier shift and to econometrically account for environmental factors.

TransGrid's proposed productivity includes additional economies of scale factors that account for the difference between direct maintenance costs and other categories that are not already included in network growth.[193] It also includes the following step decreases:

- change to Sydney office accommodation,
- payroll efficiencies,
- closure of Yass control room.

Table B-8 shows TranGrid's and our forecast annual productivity change in percentage terms.

Table B-8 AER and TransGrid's forecast productivity change (per cent)

	2014–15[a]	2015–16	2016–17	2017–18
TransGrid's proposed productivity change	0.32	1.14	0.04	0.01
AER forecast productivity change	0.86	0.86	0.86	0.86

Source: AER analysis.

Table B-9 Electricity transmission industry historical productivity 2006–13 (per cent)

Service provider	Productivity
ElectraNet	–1.82
Powerlink	0.92
AusNet Transmission	3.20
TasNetworks Transmission	0.47
TransGrid	1.47
Electricity transmission industry average	0.86

Source: Economic Insights, 2014, p. 15.

We note TransGrid's historical productivity between 2006–13 was 1.47 per cent which is higher than the industry average of 0.86 per cent. Economic Insights noted that the use of the benchmarking average transmission industry productivity provides better incentives for service providers to beat the benchmark and also reduces the risk of measurement error given this early stage of development of these measures since the industry average uses a larger data set.

Economic Insights performed sensitivity analysis for the transmission industry opex PFP against alternative output specifications. Economic Insights found that the alternative output specifications resulted in an opex PFP between 1.12 per cent and 1.77 per cent.[194]

193 TransGrid, *Response to AER information request 08*, 25 August 2014, p. 1.
194 Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 6 November 2014, p. 16.

We consider Economic Insights' sensitivity analysis indicates that the measured positive productivity between 2006–13 is robust.

As noted above TransGrid considered that any pre-emptive productivity adjustment should be limited to efficiencies that are exogenous to the business and do not derive from management effort. TransGrid stated:

> The application of a pre-emptive productivity adjustment could have the effect that TNSPs are not fairly rewarded under the EBSS for efficiency gains, or could be penalised even when they do not make efficiency losses.[195]

We note the EBSS is set in relation to forecast operating expenditure we accept or substitute for that regulatory control period.[196] We set forecast operating expenditure based on an efficient transmission network service provider. We would expect a benchmark efficient transmission network service provider to incorporate benchmark efficient productivity improvements and under the EBSS will receive the benefit of the efficiency gains derived from opex being less than the forecast operating expenditure.

Interaction between historical productivity and step changes

New service obligations and other step changes reduce a service provider's productivity. This is because the service provider incurs additional costs without increasing measured output. For an example of the impact of step changes on measured productivity growth, see Economic Insights' report.[197]

Our productivity forecast for TransGrid of 0.86 per cent is based on average historical productivity in the electricity transmission industry. Since most transmission network service providers had step changes the 0.86 per cent forecast allows for some step change activity. The question for us is whether TranGrid's forecast step changes differ materially from the step changes embedded in the historical numbers.

Analysis from Economic Insights found that if historical step changes from our previous decisions for Powerlink and TasNetworks were removed, then average industry productivity would increase from 0.86 per cent to 1.29 per cent.[198]

The step changes we approved in our most recent decisions for SP AusNet and ElectraNet occur in 2015 and 2014 respectively. Therefore the step changes for these two service providers do not affect our historical electricity transmission productivity and information on step changes for earlier decisions is not available. However, if we were to assume that the step changes for SP AusNet and ElectraNet were indicative of step changes in the previous regulatory period then this would further increase our average historical productivity estimate to 1.43 per cent.[199]

This indicates that step changes from can have a large effect on measured historical productivity. We have used an average forecast productivity measure of 0.86 per cent and to not include step

---

195 TransGrid, *Revenue proposal*, May 2014, p. 137.
196 NER, clause 6A.6.5(a)
197 Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs,* 6 November 2014, pp. 17–20.
198 Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian electricity TNSPs*, 6 November 2014, p. 19.
199 Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and Tasmanian Electricity TNSPs*, 6 November 2014, pp. 19–20.

changes, rather than an average forecast productivity measure of 1.29 per cent which would include a separate allowance for forecast step changes.

The difference between applying a productivity forecast of 1.29 per cent and 0.86 per cent is $7.5 million (real $2013–14) over 2014–18. We consider by not adjusting the productivity forecast for step changes and not including a specific adjustment for the step changes, listed in our forecast of TransGrid's opex is higher than if we had adjusted forecast productivity for step changes and included our approved step changes in our opex forecast.