DRAFT DECISION
AusNet Services transmission determination
2017–18 to 2021–22

Attachment 7 – Operating expenditure

July 2016

AUSTRALIAN ENERGY REGULATOR

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Note

This attachment forms part of the AER's draft decision on AusNet Services' revenue proposal 2017–22. 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	annual service revenue requirement
augex	augmentation expenditure
capex	capital expenditure
CCP	Consumer Challenge Panel
CESS	capital expenditure sharing scheme
CPI	consumer price index
DRP	debt risk premium
EBSS	efficiency benefit sharing scheme
ERP	equity risk premium
MAR	maximum allowed revenue
MRP	market risk premium
NEL	national electricity law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
NSP	network service provider

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

7 Operating expenditure

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

This attachment provides an overview of our assessment of opex. Detailed analysis of our assessment of opex is in the following appendices:

- Appendix A—base opex and category specific forecasts
- Appendix B—rate of change
- Appendix C—step changes.

7.1 Draft decision

We are not satisfied that AusNet Services' forecast opex reasonably reflects the opex criteria. We therefore do not accept the forecast opex AusNet Services included in its building block proposal.[1] Our alternative estimate of AusNet Services' opex for the 2017–22 period, which we consider reasonably reflects the opex criteria, is outlined in Table 7.1.[2]

Table 7.1 Our draft decision on total opex ($ million, 2016–17)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
AusNet Services' proposal	218.9	214.0	215.5	217.7	219.0	**1085.0**
AER draft decision	204.2	204.4	204.8	205.2	205.6	**1024.1**
Difference	**–14.7**	**–9.6**	**–10.7**	**–12.6**	**–13.4**	**–61.0**

Source: AER analysis.

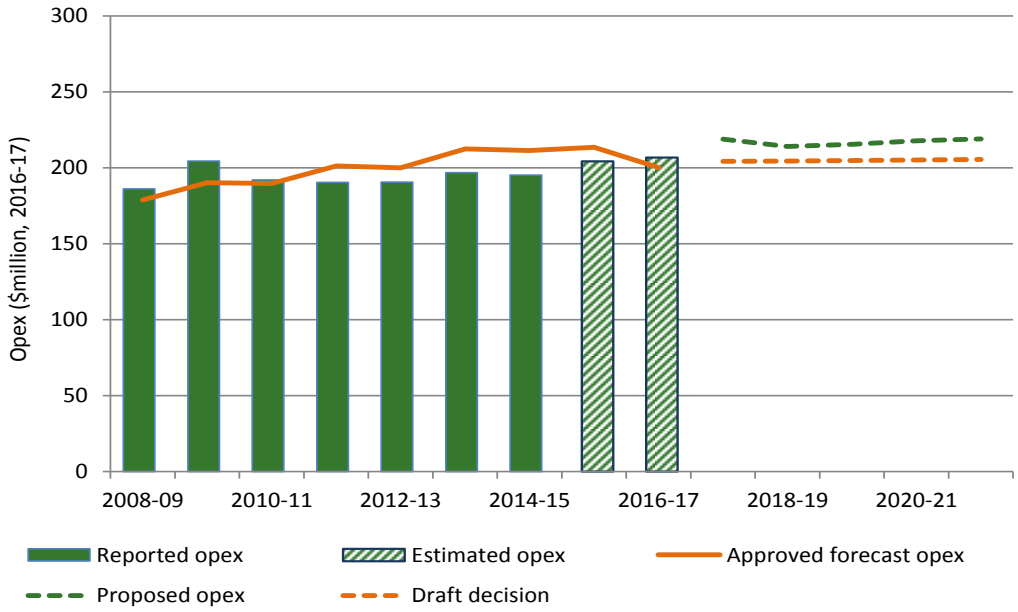
Note: Excludes debt raising costs.

Figure 7.1 shows our draft decision compared to AusNet Services' proposal, its past allowances and past actual expenditure.

1 NER, cl. 6A.6.6(c).

2 NER, cl. 6A.6.6(d).

Figure 7.1 Our draft decision compared to AusNet Services' past and proposed opex ($ million, 2016–17)



Source: AusNet Services, Regulatory accounts 2008-09 to 2014-15; AusNet Services, Economic benchmarking - Regulatory Information Notice response 2006 to 2015; AER analysis. Excludes debt raising costs.

7.2 AusNet Services' proposal

AusNet Services' proposed total opex of $1085.0 million ($2016–17) for the 2017–22 regulatory control period (excluding debt raising costs, totalling $16.7 million). We note that around half of AusNet Services' total opex forecast is for easement land tax.[3] If we exclude this tax, AusNet Services' proposal represents a 14.0 per cent increase in its annual opex compared to its annual opex spend in the 2014–17 regulatory control period.[4] AusNet Services' proposed total opex forecast is set out in Table 7.2.

Table 7.2 Proposed prescribed services opex ($million, 2016–17)

	2017–18	2018–19	2019–20	2020–21	2021–22	Total
Opex (excluding easement land tax)	103.6	98.7	100.2	102.5	103.7	508.7
Easement land tax	115.3	115.3	115.3	115.3	115.3	576.4
Opex including easement land tax	218.9	214.0	215.5	217.7	219.0	1085.0

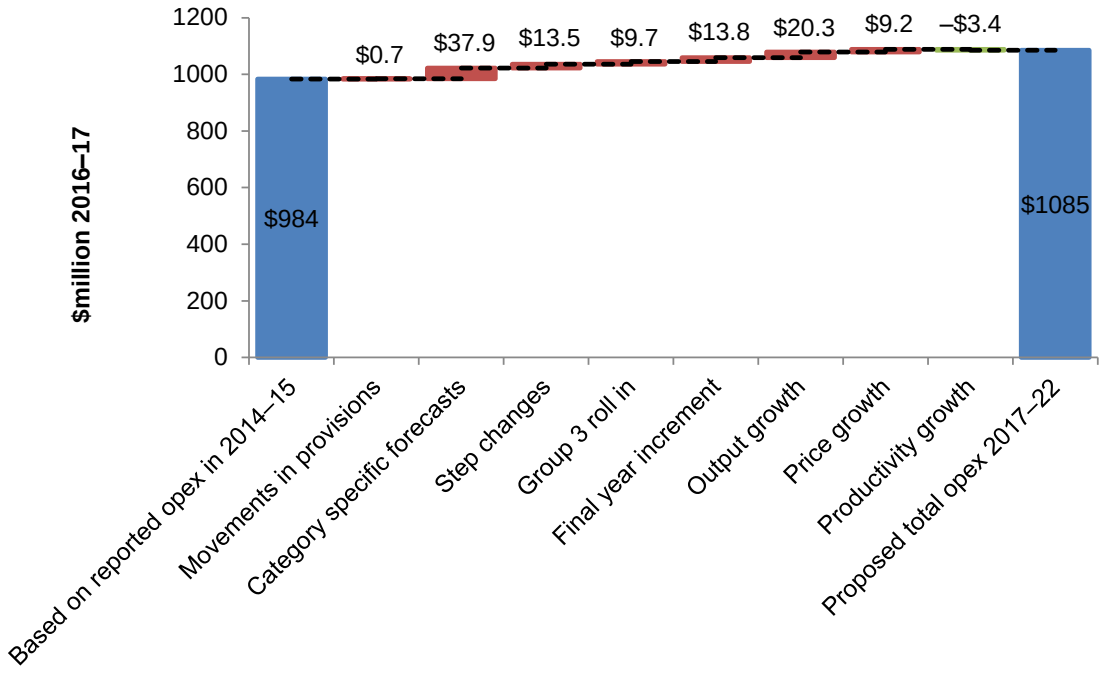
Source: AusNet Services opex model, setting debt raising costs to zero.

[3] Victoria's land tax regime extends to easements held by AusNet Services. Where the forecast we include in our opex forecast differs (higher or lower) from the actual tax paid, AusNet Services can apply for a cost pass through.

[4] Actual opex is only available for 2014–15. Opex for 2015–16 and 2016–17 is estimated. Annual opex is averaged over the regulatory control period.

In Figure 7.2 we separate AusNet Services' forecast opex into the different elements that make up its forecast.

Figure 7.2 AusNet Services' opex forecast ($ million, 2016–17)



Source: AER analysis.

We describe each of these elements below:

- AusNet Services used the actual opex it incurred in 2014–15 as the base for forecasting its opex for the 2017–22 regulatory control period. Its reported expenditure for 2014–15 would lead to base opex of $984.0 million ($2016–17) over the 2017–22 regulatory control period.
- AusNet Services' 2014–15 regulatory accounts include one-off accounting adjustments relating to changes in provisions. It adjusted base opex to remove the movement in provisions in 2014–15. The effect of this is to set the net forecast expenditure in this cost category to zero. This increased AusNet Services' forecast by $0.7 million ($2016–17).
- To forecast the increase in opex between 2014–15 and 2016–17 AusNet Services added the growth it forecast in prices, output and productivity. This is inconsistent with the approach set out in our *Expenditure forecast assessment guideline* (the Guideline). This increased AusNet Services' forecast by $13.8 million ($2016–17).
- AusNet Services included category specific forecasts for easement land tax, insurance and self-insurance costs. This increased its forecast by $37.9 million ($2016–17).

- It also included a category specific forecast for group 3 assets roll in.[5] This increased its forecast by $9.7 million ($2016–17).
- AusNet Services identified six step changes in costs it forecast it would incur during the forecast period, which were not incurred in 2014–15. This increased AusNet Services' forecast by $13.5 million ($2016–17).
- AusNet Services proposed output growth forecast using our forecasting approach. This increased AusNet Services' opex forecast by $20.3 million ($2016–17).
- AusNet Services accounted for forecast growth in prices related to labour price increases, contracted service price increases and non-labour price increases. These forecast price changes increased AusNet Services' opex forecast by $9.2 million ($2016–17).
- AusNet Services accounted for forecast growth in productivity. This decreased AusNet Services' opex forecast by $3.4 million ($2016–17).

We received submissions from the Consumer Challenge Panel (CCP) and the Energy User Coalition of Victoria (EUCV) in response to AusNet Services' proposal. Both were concerned about the increase in AusNet Services' proposed opex for the 2017–22 regulatory control period compared to historical levels.[6]

7.3 AER's assessment approach

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

Our assessment approach, outlined below, is, for the most part, consistent with the Guideline.

There are two tasks that the NER requires us to undertake in assessing total forecast opex. In the first task, we form a view about whether we are satisfied a service provider's proposed total opex forecast reasonably reflects the opex criteria.[7] If we are satisfied, we accept the service provider's forecast.[8] In the second task, we determine a substitute estimate of the required total forecast opex that we are satisfied

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5 Group 3 asset roll in: During any regulatory control period, AEMO or a distribution business may request AusNet Services to augment the transmission network or distribution connection services. We do not roll these assets into the regulated asset base until the subsequent revenue determination. AusNet Services refer to these assets as 'group 3 assets'.

6 CCP (subpanel 5), *Submission in response to AusNet Services' 2017–22 transmission determination proposal*, February 2016, p. 29;
EUCV, *Submission in response to AusNet Services' 2017–22 transmission determination proposal*, February 2016, pp. 27–29.

7 NER, cll. 6A.6.6(c) and 6A.14.1(3).

8 NER, cll. 6A.6.6(c) and 6A.14.1(3)(i).

reasonably reflects the opex criteria.[9] We only undertake the second task if we do not accept the service provider's forecast after undertaking the first task.

In both tasks, our assessment begins with the service provider's proposal. We also develop an alternative forecast to assess the service provider's proposal at the total opex level. The alternative estimate we develop, along with our assessment of the component parts that form the total forecast opex, inform us of whether we are satisfied that the total forecast opex reasonably reflects the opex criteria.

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:[10]

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

The opex criteria that we must be satisfied a total forecast opex reasonably reflects are:[11]

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

The AEMC noted that '[t]hese criteria broadly reflect the NEO [National Electricity Objective]'.[12]

The service provider's forecast is intended to cover the expenditure that will be needed to achieve the opex objectives. The opex objectives are:[13]

1. meeting or managing the expected demand for prescribed transmission services over the regulatory control period
2. complying with all applicable regulatory obligations or requirements associated with providing prescribed transmission services
3. where there is no regulatory obligation or requirement, maintaining the quality, reliability and security of supply of prescribed transmission services and maintaining the reliability and security of the transmission system

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9 NER, cll. 6A.6.6(d) and 6A.13.2(b)(3).

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

11 NER, cl. 6A.6.6(c).

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

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

4. maintaining the safety of the transmission system through the supply of prescribed transmission services.

Whether we are satisfied that the service provider's total forecast reasonably reflects the opex criteria is a matter for judgment. This involves us exercising discretion. However, in making this decision we treat each opex criterion objectively and as complementary. When assessing a proposed forecast, we recognise that efficient costs are not simply the lowest sustainable costs. They are the costs that an objectively prudent service provider would require to achieve the opex objectives based on realistic expectations of demand forecasts and cost inputs. It is important to keep in mind that the costs a service provider might have actually incurred or will incur due to particular arrangements or agreements that it has committed to may not be the same as those costs that an objectively prudent service provider requires to achieve the opex objectives.

Further, in undertaking these tasks we have regard to the opex factors.[14] We attach different weight to different factors. This approach has been summarised by the AEMC as follows:[15]

> 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 that 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
- 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

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[14] NER, cll. 6A.6.6(e), 6A.14.1(3)(ii).

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

- 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
- 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 the Guideline

  as updated from time to time.

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

As we noted above, the two tasks that the NER requires us to undertake involve us exercising our discretion. In exercising discretion, the National Electricity Law (NEL) requires us to take into account the revenue and pricing principles (RPPs).[16] In the overview we discussed how we generally have taken into account the RPPs in making this final decision. Our assessment approach to forecast opex ensures that the amount of forecast opex that we are satisfied reasonably reflects the opex criteria is an amount that provides the service provider with a reasonable opportunity to recover at least its efficient costs.[17] By us taking into account the relevant capex/opex trade-offs, our assessment approach also ensures that the service provider faces the appropriate incentives to promote efficient investment in and provision and use of the network and

[16] NEL, ss. 7A and 16(2).

[17] NEL, s. 7A(2).

minimises the costs and risks associated with the potential for under and over investment and utilisation of the network.[18]

Expenditure forecast assessment guideline

After conducting an extensive consultation process with service providers, users, consumers and other interested stakeholders, we issued the Expenditure forecast assessment guideline in November 2013 together with an explanatory statement.[19] The Guideline sets out our intended approach to assessing opex in accordance with the NER.[20]

While the Guideline provides for regulatory transparency and predictability, it is not binding. We may depart from the approach set out in the Guideline but we must give reasons for doing so.[21] For the most part, we have not departed from the approach set out in the Guideline in this final decision.[22] In our Framework and Approach paper, we set out our intention to apply the Guideline approach in making this determination.[23] There are several parts of our assessment:

1. We develop an alternative estimate to assess a service provider's proposal at the total opex level. [24] We recognise that a service provider may be able to adequately explain any differences between its forecast and our estimate. We take into account any such explanations on a case by case basis using our judgment, analysis and stakeholder submissions.
2. We assess whether the service provider's forecasting method, assumptions, inputs and models are reasonable, and assess the service provider's explanation of how its method results in a prudent and efficient forecast.
3. We assess the service provider's proposed base opex, step changes and rate of change if the service provider has adopted this methodology to forecast its opex.

Each of these assessments informs our first task. Namely, whether we are satisfied that the service provider's proposal reasonably reflects the opex criteria.

If we are not satisfied with the service provider's proposal, we approach our second task by using our alternative estimate as our substitute estimate. This approach was

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18 That is, the trade-offs that may arise having considered the substitution possibilities between opex and capex, and the relative prices of operating and capital inputs: NER, cll. 6A.6.6(e)(6) and 6A.6.6(e)(7); NEL, ss. 7A(3), 7A(6) and 7A(7).

19 AER, *Expenditure forecast assessment guideline - explanatory statement*, November 2013.

20 NER, cl. 6A.6.6.

21 NER, cl. 6A.2.3(c).

22 We did not apply the DEA benchmarking technique. We outline the reasons why we did not apply this technique in Appendix A of our all NSW distribution determinations for the 2015–20 regulatory control period.

23 AER, *Final Framework and approach for AusNet Services*, April 2015, p. 25.

24 AER, *Expenditure forecast assessment guideline for electricity transmission*, November 2013, p. 7.

expressly endorsed by the AEMC in its decision on the major rule changes that were introduced in November 2012. The AEMC stated:[25]

> 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.

We recognise that our alternative estimate may not exactly match the service provider's forecast. The service provider may have adopted a different forecasting method. However, if the service provider's inputs and assumptions are reasonable and efficient, we expect that its method should produce a forecast consistent with our estimate. We discuss below how we develop our alternative estimate.

Building an alternative estimate of total forecast opex

The method we use to develop our alternative estimate involves five key steps. We outline these steps below in Figure 7.3.

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

Figure 7.3 How we build our alternative estimate

Underlying our approach are two general assumptions:

1. the efficiency criterion and the prudency criterion in the NER are complementary

2. actual operating expenditure was sufficient to achieve the opex objectives in the past.

We have used this general approach in our past decisions. It is a well-regarded top-down forecasting model that has been employed by a number of Australian regulators over the last fifteen years. We refer to it as a 'revealed cost method' in the Guideline (and we have sometimes referred to it as the base-step-trend method in our past regulatory decisions).[26]

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

We have set out more detail about each of the steps we follow in developing our alternative estimate below.

Step 1 – Base year choice

The starting point for our analysis is 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, there are 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, the incentive regime works to penalise the service provider when it is relatively less efficient. This provides 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 material cost was incurred in the base year that is unrepresentative of a service provider's future opex we may remove it from the base year in undertaking our assessment.

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

- Rather than use all of the opex that a service provider incurs in the base year, service providers also often forecast specific categories of opex using different methods. We must also assess these methods in deciding what the starting point should be. If we agree that these categories of opex should be assessed differently, we will also remove them from the base year.

As part of this step we also need to consider any interactions with the incentive scheme for opex, the Efficiency Benefit Sharing Scheme (EBSS). The EBSS is designed to achieve a fair sharing of efficiency gains and losses between a service provider and its consumers. Under the EBSS, service providers receive a financial reward for reducing their costs in the regulatory control period and a financial penalty for increasing their costs. The benefits of a reduction in opex flow through to consumers as long as base 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 opex

The service provider's actual expenditure in the base year may not form the starting point of a total forecast opex that we are satisfied reasonably reflects 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 therefore test the actual expenditure in the base year.

As we set out in the Guideline, to assess the service provider's actual expenditure, we use a number of different qualitative and quantitative techniques.[27] This includes benchmarking and detailed reviews. Benchmarking allows us to compare the relative efficiency of different service providers.

If we find that a service provider's base year expenditure is materially inefficient, the question arises about whether we would be satisfied that a total forecast opex predicated upon that expenditure reasonably reflects the opex criteria. Should this be the case, for the purposes of forming our starting point for our alternative estimate, we will adjust the base year expenditure to remove any material inefficiency.

Step 3 - Rate of change

We also assess an annual escalator that is applied to take account of the likely ongoing changes to opex over the forecast regulatory control period. Opex that reflects the opex criteria in the forecast regulatory control period could reasonably differ from the starting point due to:

- price growth

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

- output growth
- productivity growth.

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

Step 4 - Step changes

Next we consider if any other opex is required 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 the Guideline explains, we will typically include a step change only if efficient base opex and the rate of change in opex of an efficient service provider do not already include the proposed cost.[28]

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

In our final step, we assess the need to make any further adjustments to our opex forecast. 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 alternative estimate.

7.4 Reasons for draft decision

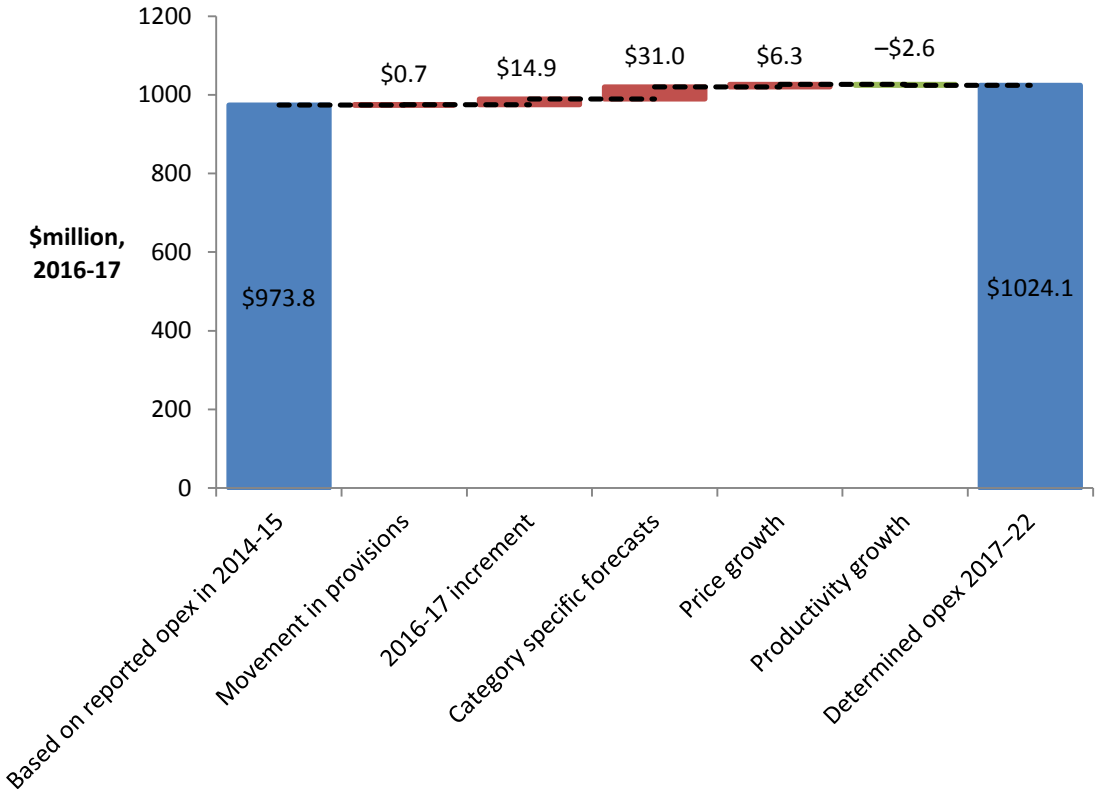
We are not satisfied that AusNet Services' proposed total forecast opex of $1085.0 million ($2016–17) reasonably reflects the opex criteria.[29] As we discussed above, we have therefore used our alternative estimate as our substitute estimate.

Figure 7.4 illustrates how we constructed our alternative forecast of $1024.1 million ($2016–17).

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

[29] Excludes debt raising costs.

Figure 7.4 AER draft decision opex forecast



Source: AER analysis.

Table 7.3 summarises the quantum of the difference between AusNet Services' proposed total opex and our preliminary decision estimate.

Table 7.3 Proposed vs draft decision total forecast opex ($ million, 2015)

	2017-18	2018-19	2019-20	2020-21	2021-22	Total
AusNet Services' proposal	218.9	214.0	215.5	217.7	219.0	**1085.0**
AER draft decision	204.2	204.4	204.8	205.2	205.6	**1024.1**
Difference	**–14.7**	**–9.6**	**–10.7**	**–12.6**	**–13.4**	**–61.0**

Source: AER analysis.

Note: Excludes debt raising costs.

We outline the key elements of our alternative opex forecast and areas of difference between our estimate of opex and AusNet Services' estimate below.

7.4.1 Base opex

We have forecast a base opex amount of $978.4 million ($2016–17). Consistent with AusNet Services' proposal we have relied on AusNet Services' reported opex in 2014–15 to forecast opex. Benchmarking indicates AusNet Services is operating relatively efficiently when compared to other service providers in the NEM so we consider this is a reasonable starting point for determining our opex forecast.

In deriving our forecast of base opex, we have:

- removed movement in provisions reported as opex in 2014–15
- removed easement land tax and debt raising costs because we adopt a category specific forecast for these categories
- removed the AIS rebate because the scheme has ceased
- added our forecast increase in opex between 2014–15 and 2016–17.

7.4.2 Rate of change

Once we have determined the opex required in the final year of the of the 2014–17 regulatory control period we apply a forecast annual rate of change to forecast opex for the 2017–22 regulatory control period.

Our forecast of the overall rate of change used to derive our alternative estimate of opex is lower than AusNet Services' over the forecast period. Figure 7.5 below compares AusNet Services' and our overall rate of change for the 2017–22 regulatory control period, in percentage terms.

Figure 7.5 Forecast annual rate of change in opex (per cent)

	2017–18	2018–19	2019–20	2020–21	2021–22
AusNet Services	2.21	1.94	1.93	1.99	2.01
AER	0.09	0.31	0.40	0.43	0.43
Difference	**–2.12**	**–1.62**	**–1.53**	**–1.56**	**–1.57**

Source: AER analysis; AusNet Services, *Revenue proposal*, 30 October 2015, p. 125.

The following factors drive the difference between our forecast rate of change and AusNet Services':

- AusNet Services' forecast of labour price growth overstates the cost inputs required by a prudent and efficient DNSP in the forecast period. This key reasons for this are:
    - AusNet Services forecasting approach treats all services contract expenditure as labour. This assumes that the price change of contractors' non-labour inputs is the same as their labour inputs. We do not consider this is a reasonable assumption.

    - AusNet Services relies on outdated forecasts of WPI growth for the Victorian utilities industry that overstate the expected growth in labour prices.
- AusNet Services' output growth forecast incorrectly assumes that the increase in opex due to output growth that occurs in the 2017–22 regulatory control period will be incurred by AusNet Services. Under existing arrangements, AEMO will fund the operation and maintenance of new augmentation and connection assets during the 2017–22 regulatory control period.
- AusNet Services' productivity growth relies on outdated forecasts of productivity growth.

We outline our detailed assessment of the rate of change in appendix B.

7.4.3 Step changes

AusNet Services proposed six step changes to its base level of opex, totalling $13.5 million ($2016–17) or 2.7 per cent of its total opex forecast.[30] The proposed step changes are to:

- establish an IT security team
- implement new emergency response arrangements
- roll out Smart Aerial Image Processing (SAIP)
- lease a mobile switchboard for West Melbourne Terminal Station (WMTS)
- decommission synchronous condensers at the Fishermans Bend, Brooklyn and Templestowe Terminal Stations
- decommission transmission assets at Morwell Power Station (MPS).

We have not included these step changes in our draft decision total opex forecast. We are not satisfied these proposed cost increases above the base level opex (escalated by the rate of change) are required in order to arrive at a forecast of total opex that reasonably reflects the opex criteria.[31]

7.4.4 Other costs not included in the base year

We have included the following category specific forecasts in our draft decision total opex forecast:

- easement land tax
- group 3 asset roll in
- debt raising costs.

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30 AusNet Services, *Revenue proposal 2017–22, section 5.10,* October 2015, p. 135, and, *Attachment 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 5.

31 NER, cl. 6A.6.6.

We discuss our forecast of easement land tax and group 3 asset roll in, in appendix A.

Debt raising costs are transaction costs incurred each time debt is raised or refinanced. Our assessment approach for debt raising costs and the reasons for our forecast are set out in the debt and equity raising costs appendix in the rate of return attachment 3.

7.4.5 Interrelationships

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

- the operation of the EBSS in the 2014–17 regulatory control period, which provided AusNet Services an incentive to reduce opex in the 2014–15 base year
- the roll in of assets identified by AusNet Services as group 3 assets, which affects both the opening asset base and our category specific forecast for the group 3 roll in
- the impact of cost drivers that affect both forecast opex and forecast capex. For instance forecast labour price growth affects forecast capex and our forecast of forecast price growth used to estimate the rate of change in opex
- the approach to assessing the rate of return, to ensure there is consistency between our determination of debt raising costs and the rate of return building block
- concerns of electricity consumers identified in the course of its engagement with consumers.

7.4.6 Assessment of opex factors

In deciding whether we are satisfied the service provider's forecast reasonably reflects the opex criteria we have regard to the opex factors.[32] Table 7.4 summarises how we have taken the opex factors into account in making our preliminary decision.

Table 7.4 AER consideration of opex factors

Opex factor	Consideration
The most recent annual benchmarking report that has been published under rule 6A.31 and the benchmark operating expenditure that would be incurred by an efficient network 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

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

Opex factor	Consideration
	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 estimated the benchmark opex that an efficient service provider would require over the forecast period. We have used our judgment to form a view on the efficiency of AusNet Services' proposed total forecast opex compared to the benchmark efficient opex that would be incurred over the relevant regulatory control period.
The actual and expected operating expenditure of the transmission network service provider during any proceeding regulatory control periods.	Our forecasting approach uses the service provider's actual opex as the starting point. We have compared several years of AusNet Services' actual past opex with that of other service providers to form a view about whether or not its revealed expenditure is sufficiently efficient to rely on it as the basis for forecasting required opex in the forthcoming period.
The extent to which the operating expenditure forecast includes expenditure to address the concerns of electricity consumers as identified by the Network 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 revenue proposals, such that they factor in the needs of consumers.[33]
The relative prices of capital and operating inputs	We have considered capex/opex trade-offs in considering AusNet Services' proposed step changes. We have had regard to multilateral total factor productivity benchmarking when deciding whether or not forecast opex reflects the opex criteria. Our multilateral total factor productivity analysis considers the overall efficiency of networks with in the use of both capital and operating inputs with respect to the prices of capital and operating inputs.
The substitution possibilities between operating and capital expenditure.	Some of our assessment techniques examine opex in isolation—either at the total level or by category. Other techniques consider service providers' overall efficiency, including their capital efficiency. We have relied on several metrics when assessing efficiency to ensure we appropriately capture capex and opex substitutability. In developing our benchmarking models we have had regard to the relationship between capital, opex and outputs. We also had regard to multilateral total factor productivity benchmarking when deciding whether or not forecast opex reflects the opex criteria. Our multilateral total factor productivity analysis considers the overall efficiency of networks with in the use of both capital and operating inputs.

[33] AEMC, *Rule Determination*, 29 November 2012, pp. 101, 115.

Opex factor	Consideration
	Further, we considered the different capitalisation policies of the service providers' and how this may affect opex performance under benchmarking.
Whether the operating expenditure forecast is consistent with any incentive scheme or schemes that apply to the network service provider under clauses 6A.6.5, 6A.7.4 or 6A.7.5.	The incentive scheme that applied to AusNet Services' opex in the 2014–17 regulatory control period, the EBSS, was intended to work in conjunction with a revealed cost forecasting approach. We have applied our estimate of base opex consistently in applying the EBSS and forecasting AusNet Services' opex for the 2017–22 regulatory control period.
The extent the operating expenditure forecast is referable to arrangements with a person other than the network service provider that, in the opinion of the AER, do not reflect arm's length terms.	Some of our techniques assess the total expenditure efficiency of service providers and some assess the total opex efficiency. Given this, we are not necessarily concerned whether arrangements do or do not reflect arm's length terms. A service provider which uses related party providers could be efficient or it could be inefficient. Likewise, for a service provider that does not use related party providers. If a service provider is inefficient, we adjust their total forecast opex proposal, regardless of their arrangements with related providers.
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).	This factor is only relevant in the context of assessing proposed step changes (which may be explicit projects or programs). We did not identify any contingent projects in reaching our preliminary decision.
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.
The extent the network service provider has considered, and made provision for, efficient and prudent non-network alternatives.	We have not found this factor to be significant in reaching our preliminary decision.
Any relevant project assessment conclusions report required under 5.16.4.	We identified any RIT–T project that has been submitted by the AusNet Services and ensured that the conclusions were appropriately addressed in the total forecast opex. We are unaware of any RIT–T project being submitted by AusNet Services.
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.

A Base opex

As opex is relatively recurrent, we typically forecast based on a single year of opex. We call this the base opex amount. In this section, we set out our assessment of AusNet Services' base opex.

A.1 Position

To form our alternative opex forecast we have used a forecast based on AusNet Services' actual opex in 2014–15.

We adjusted opex to:

- remove movements in provisions
- remove debt raising costs
- remove easement land tax
- remove the costs of priority projects approved under the network capability component of STPIS
- remove the AIS rebate.

We then added our forecast increase in opex between 2014–15 and 2016–17.

The resulting base opex amount is $87.8 million ($2016–17).

A.2 AusNet Services' proposal

AusNet Services proposed a base opex amount of $83.7 million ($2016–17) based on its actual opex in 2014–15. It adjusted its actual opex in 2014–15 to:

- remove movements in provisions in 2014–15
- remove opex where it adopted a category specific forecasting approach for easement land tax, insurance and self-insurance
- remove the AIS rebate
- add back debt raising costs.

AusNet Services then estimated 2016–17 opex by applying its proposed rate of change for the 2017–22 regulatory control period.

A.3 Assessment approach

In the Guideline, we explain that a 'revealed cost' approach is our preferred approach to assessing base opex. If actual expenditure in the base year reasonably reflects the opex criteria, we will set base opex equal to actual expenditure for those cost categories forecast using the revealed cost approach.

We will use a combination of techniques to assess whether base opex reasonably reflects the opex criteria. This includes economic benchmarking and partial

performance indicators. Benchmarking broadly refers to the practice of comparing the economic performance of a group of service providers that all provide the same service as a means of assessing their relative performance. If our economic benchmarking indicates a service provider's base year opex is materially inefficient, our approach is to complement our benchmarking findings with other analysis such as partial performance indicators (PPIs) and detailed review.

Where a service provider proposes adjustments to base opex then we assess whether those adjustments would lead to a total opex forecast that reasonably reflects the opex criteria.

A.4 Reasons for our decision

Our assessment of AusNet Services' base opex is set out below under the following headings:

- AusNet Service's overall efficiency
- Choice of base year
- Adjustments to base opex
- Estimate of final year opex.

A.4.1 AusNet Services' overall efficiency

Our benchmarking results do not indicate AusNet Services' base opex is materially inefficient.

We have used economic benchmarking as a 'first pass' test to assess whether AusNet Services' opex shows signs of material inefficiency. On this basis we do not consider there is evidence justifying a departure from a revealed cost forecasting approach for AusNet Services.

We consider our benchmarking models are the most robust measures of overall efficiency available. At the same time, however, we recognise that there is no perfect benchmarking model. In contrast to electricity distribution networks, where there has been a long history of benchmarking by international regulators, the benchmarking of transmission networks is relatively new. As a result, and because our models do not take into account different operating environments, the comparison of productivity levels between firms should be treated with caution. The CCP submitted that while caution should be taken in drawing conclusions, the 2014 and 2015 benchmarking released by the AER uses a reasonable and appropriate methodology.[34]

The benchmarking techniques measure either the overall efficiency of service providers or how efficiently they use one particular input such as opex. MTFP

[34] CCP (subpanel 5), *Submission in response to AusNet Services' proposal to its 2017–22 transmission determination*, February 2016, p. 22.

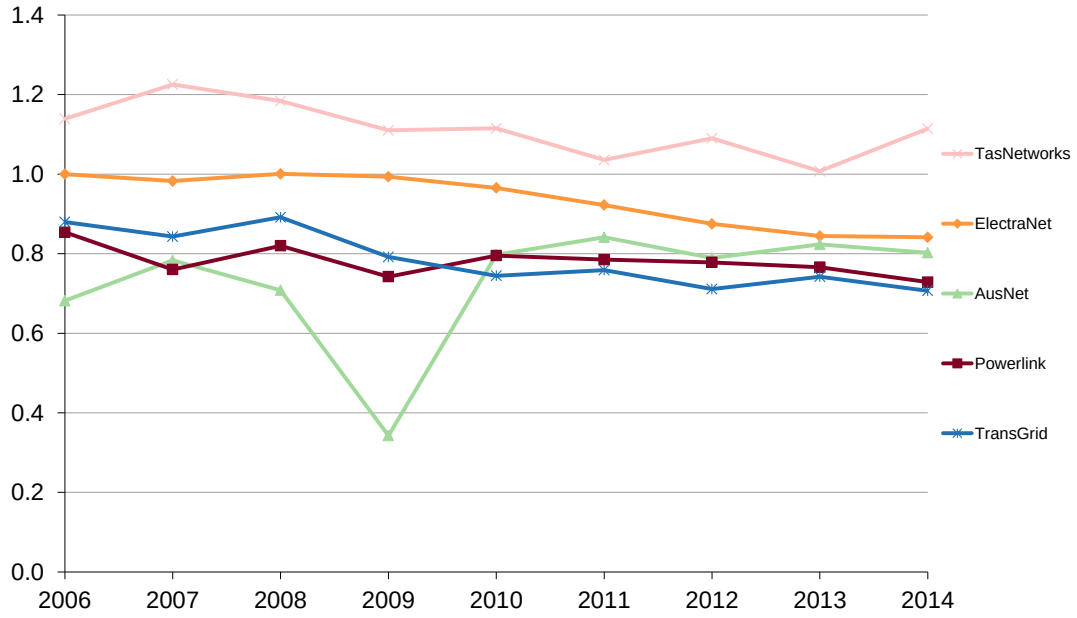
measures total output relative to an index of all inputs used. MTFP allows for the comparison of productivity levels between service providers and across time. MPFP measures total output relative to one particular input (e.g. opex partial productivity is the ratio of total output quantity index to an index of opex quantity).

MTFP and MPFP modelling does not indicate AusNet Services is materially inefficient overall or that it is materially inefficient in its use of opex.

Figure A.1 presents the MTFP of each transmission network service provider. The graph illustrates that AusNet Services' level of productivity (the green line) is in the middle of the range of the five transmission network service providers.

The CCP submitted that the multilateral total factor productivity should be a focus for improvement in the best interests of consumers, as it would indicate networks are being used more efficiently.[35]

Figure A.1 Multilateral total factor productivity by TNSP for 2006–14



Source: AER, *2015 Annual benchmarking report, Electricity transmission network service providers*, November 2015, p. 5.

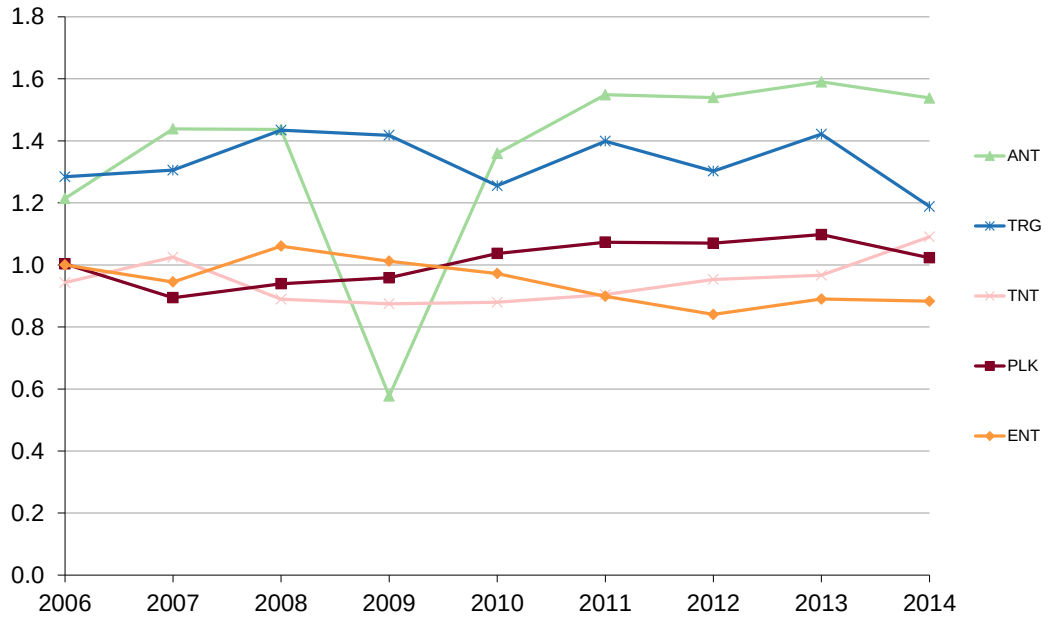
Note: In 2009 AusNet Services had large customer interruptions which are why it performs poorly in this year.

Figure A.2 presents the opex MPFP results for all transmission network service providers over the same period. The MPFP scores indicate that AusNet Services has relatively high productivity level compared to the other TNSPs.

[35] CCP (subpanel 5), *Submission in response to AusNet Services' proposal to its 2017–22 transmission determination*, February 2016, p. 23.

As would be expected, the performance of the service providers changes somewhat under this comparison technique, reflecting the different combination of opex and capital used by the service providers to deliver network services.

Figure A.2 Opex partial factor productivity for 2006–14



Source: AER, *2015 Annual benchmarking report, Electricity transmission network service providers*, November 2015, p. 17.

A.4.2 Choice of base year

To form our alternative opex forecast we have used a forecast based on AusNet Services' actual opex in 2014–15.

Our choice of base year is consistent with AusNet Services' choice of base year. It proposed the use of 2014–15 as the base year (subject to adjustments) because:

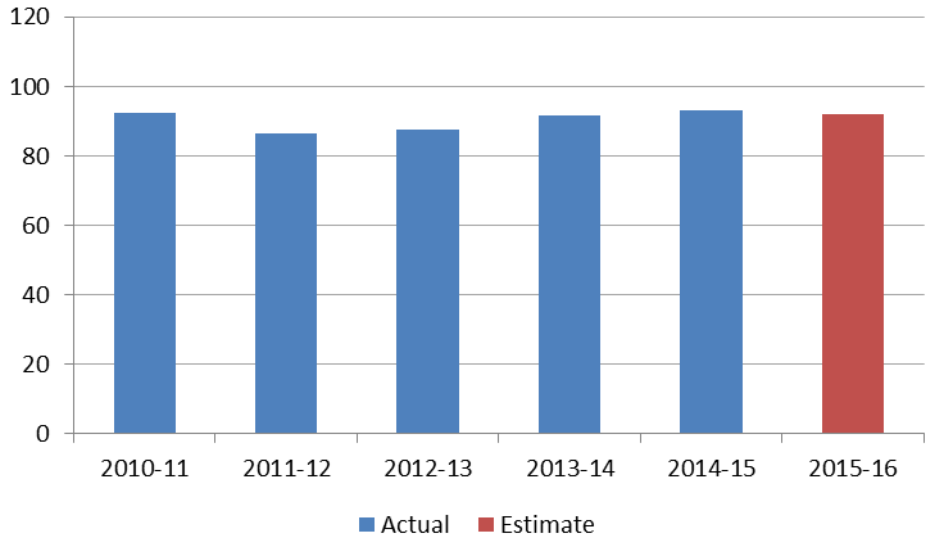
- it was the most recent year for which audited actual expenditure is available when it submitted its proposal
- the regulatory framework provides incentives to minimise costs in this year
- it considered it benchmarked favourably with its peers in Australia and overseas.

We consider using 2014–15 as the base year to forecast opex for the 2017–22 regulatory control period will produce an opex forecast consistent with the opex criteria because:

- Our benchmarking indicates that AusNet Services is relatively efficient overall and also in the use of its opex.
- 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 easement land tax and movement in provisions, total opex is stable from 2010–11 to date (see Figure A.3 below). The stability of opex is consistent with a business responding to the constant incentive to reduce opex provided by the EBSS.
- Using a 2014–15 base year for forecasting opex is consistent with the operation of AusNet Services' EBSS. When assessing the service providers opex forecasts we must have regard to whether the opex forecast is consistent with the EBSS. The EBSS that applied to AusNet Services in the 2014–17 regulatory control period assumes 2014–15 is the base year used to forecast opex for the 2017–22 period. If the EBSS and opex forecast assume different base years then network users may not receive their share of efficiency gains.

Figure A.3 AusNet Services' actual opex ($ million, 2016–17)



Source: AusNet Services, Opex Model, October 2015.

Note: Excludes easement land tax and movements in provisions.

A.4.3 Adjustments to base opex

We consider a base-step-trend approach applied to all categories produces a total opex forecast consistent with the opex criteria. However, in limited circumstances, it may be necessary to adopt a category specific forecast for certain categories of opex for our total opex forecast to meet the opex criteria. Where this is the case, we remove these categories of opex from the base year and add a category specific forecast to the base opex forecast.

AusNet Services proposed category specific forecasts for easement land tax, insurance and self-insurance.[36] AusNet services proposed a base-step-trend approach to forecast debt raising costs.

In our alternative opex forecast we have included category specific forecasts and removed the following categories of opex from the base year:

- easement land tax
- debt raising costs.

Table A.1 summaries the differences between the category specific forecasts AusNet Services included in its opex forecast and those we included in our opex forecast in our draft decision.

Table A.1 Adjustments to base opex to substitute category specific forecasts

	AusNet Services	AER draft decision
	Remove from base year to substitute a category specific forecast	Remove from base year to substitute a category specific forecast
Easement land tax	x	x
Debt raising costs		x
Insurance	x	
Self-insurance	x	

Source: AER analysis.

Easement land tax

AusNet Services' network is built on a series of easements, which are subject to the Victorian Government's easements land tax. AusNet Services is required to forecast its easement land tax liability as part of the forecast opex. Where the forecast we include in our opex forecast differs (higher or lower) from the actual tax paid, AusNet Services is entitled to apply for a cost pass through.[37] AusNet Services' easement land tax is typically half of its total opex forecast.

AusNet Services proposed an easement land tax forecast based on its most recent tax assessment notice. We are satisfied this is a reasonable basis to forecast easement land tax.

The EUCV submitted the easement land tax replaced the smelter levy. It considered the Victorian government would revoke the easement land tax when the government

[36] AusNet Services, *Revenue proposal*, October 2015, opex model.

[37] Valuation of Land Tax Act 1960 (Vic), s 5B: valuations of transmission easements by the Valuer–General occur every two years in even numbered years.

liability to Alcoa which caused this levy no longer applied.[38] The EUCV requested us to ensure the amount of forecast easement land tax is legitimate. It also requested us to ensure the amount of the tax reflects the amounts that the government requires to offset its liabilities to Alcoa. Further, requested we query the Victorian government about when the easement land tax might cease.

We have no evidence that the easement land tax will cease to apply to AusNet Services over the 2017–22 regulatory control period. As noted above, a pass–through provision provides assurance that neither AusNet Services, nor its customers, will receive a windfall gain (or loss) due to the actual land tax payments required of AusNet Services being lower (or higher) than forecast in its revenue determination.

The Victorian State Government ultimately decides whether and how much easement land tax it will impose.

Debt raising costs

Our draft decision is to apply a category specific forecast based on a benchmark for debt raising costs.

AusNet Services proposed using a revealed cost forecasting approach for debt raising costs. That is, it proposed leaving debt raising costs in the base year.[39]

However, our preferred approach is to forecast debt raising costs based on a benchmarking approach rather than a service provider's actual costs in a single year. This provides for consistency with the forecast of the cost of debt in the rate of return building block. We discuss this in the equity and debt raising costs appendix to Attachment 3.

Insurance and self-insurance

We have not included a category specific forecast for insurance or self-insurance in our total opex forecast. Instead we have left insurance and self-insurance costs in the base year and applied a revealed cost forecasting approach. As outlined in the Guideline, base year expenditure is escalated by the forecast rate of change in opex, which includes forecast price change.

AusNet Services has forecast its insurance and self-insurance premium costs on a bottom-up basis. It stated it did this given the magnitude of its insurance premiums and the volatile nature of self-insurance losses.[40] AusNet Services considered our

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38 EUCV, *Submission in response to AusNet Services' 2017–22 transmission determination proposal*, February 2016, p. 29.

39 AusNet Services, *Revenue proposal*, October 2015, opex model.

40 AusNet Services, *Revenue proposal 2017–22, October 2015, p. 115.*

approach of rolling forward base year insurance premiums at the rate of change should not be applied to it in light of its forecast cost increases.[41]

Insurance

AusNet Services proposed a category specific forecast for insurance of $28.9 million ($2016–17). This increased its total opex forecast by $2.2 million compared to leaving insurance costs in the base year.[42]

AusNet Services stated that insurance costs are a significant component of opex, accounting for around 6 per cent of its controllable opex forecast over the 2017–22 regulatory control period.[43] It stated that our approach implies that any increase in insurance is offset by a similarly large decline in other opex costs. Given the quantum of its insurance premiums relative to other costs, AusNet Services did not consider such offsets would exist.

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 efficient level of opex. Frontier Economics made this point when they reviewed the forecasting approach AusNet Services (then SP AusNet) adopted to forecast its opex in its previous transmission determination:[44]

> 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 acknowledge the market price for insurance changes 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. Figure A.3 above supports our position. It

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41 AusNet Services, *Revenue proposal 2017–22, October 2015, p. 133.*

42 All other things being held equal.

43 AusNet Services, *Revenue proposal 2017–22, October 2015, p. 133.*

44 Frontier Economics, *Opex forecasting and EBSS advice for the SP AusNet final decision*, January 2014, p 17.

shows AusNet Services' total opex has been relatively stable since 2010–11 despite increasing insurance premiums.

The CCP submitted it was concerned about AusNet Services' proposed increase in insurance costs. It was not convinced by AusNet Services' reason to include a category specific forecast. It proposed we maintain the approach of rolling forward base year premiums and regard insurance costs as part of 'base' opex.[45]

We note AusNet Services has joint insurance for its transmission and distribution businesses. To forecast insurance costs for its transmission business, it forecast the joint base premiums and then allocated the appropriate portion to the transmission business. We note that in our recent determination for AusNet Services' distribution business we forecast its insurance on a base-step-trend approach. That is, we left insurance in the base year and applied the same rate of change we applied to the total opex forecast. AusNet Services adopted this approach in its revised proposal.[46]

Self-insurance

AusNet Services proposed a category specific forecast for self-insurance of $13.5 million ($2016–17). This increased its total opex forecast by $3.2 million ($2016–17) compared to leaving self-insurance costs in the base year.

AusNet Services stated self-insurance losses are volatile and can vary markedly from year to year.[47] For this reason, it considered our approach of relying on actual losses in a single year is likely to result in a less accurate forecast of self-insurance than a forecast based on expected losses, particularly if base year opex is influenced by an abnormally high or low level of self-insurance losses.

The NER requires us to form a view on total opex, rather than on components such as self-insurance.[48] Consequently, we make our assessment about the total forecast opex amount and not about particular categories or projects in the opex forecast. Within total opex we would expect some variation in the composition of expenditure from year to year. That is, expenditure for some categories would be higher than usual in a given year while other categories would be lower than usual. However, these variations are expected to offset each other so that total opex is relatively stable. This expectation is consistent with AusNet Services' past opex which has been relatively stable since 2010–11 (see Figure 7.1). We would generally expect that a prudent and efficient service provider would reallocate resources between different projects and between different categories in response to its changing business needs. In this context, using a category specific forecasting method may produce a better forecast of expenditure for a particular category but we do not consider it produces a better forecast of total opex.

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45 CCP (subpanel 5), *Submission in response to AusNet Services' 2017–22 transmission determination proposal*, February 2016, p. 29.

46 AusNet Services, *Revised regulatory proposal 2016–20*, January, 2016, p. 4-3.

47 AusNet Services, *Revenue proposal 2017–22, October 2015, p. 146.*

48 NER, clause 6.5.6(c).

Both we and AusNet Services have forecast opex for 2017–22 by predominantly using a top down revealed cost method. That is, both we and AusNet Services have taken the costs incurred in 2014 and used them to estimate total opex for the 2017–22 regulatory control period.

We use this approach because total opex tends to be relatively stable—suggesting it is a reasonable basis for forecasting total opex for the next regulatory control period. As stated above, AusNet Services' total opex has been stable since 2010–11. This is the case even though self-insurance costs may have been volatile.

By using a revealed cost approach neither we nor AusNet Services are forecasting that the opex AusNet Services incurred in 2014–15 for each specific program or category will be the same in each year of the next regulatory control period. We have not considered what forecast opex AusNet Services will spend on each opex program and project in the next regulatory control period. The top down nature of this approach (which is consistent with the NER requirement to determine opex in total) means it is not necessary for us to consider exactly how AusNet Services intends to allocate opex to programs and projects in the next regulatory control period. In its proposal, with the exception of proposed step changes, AusNet Services has not sought to explain what it expects to spend on each program in the next regulatory control period.

We also have concerns about category specific forecasting approaches when used in conjunction with a revealed cost forecasting approach. Under such a hybrid approach, a service provider has an incentive to use a bottom-up forecasting approach for new projects or programs, or where the cost is expected to rise in the forecast period. Where a service provider expects the costs of projects or programs to decline, its incentive is to use a base year approach. Under such a hybrid forecasting approach, a service provider would be financially rewarded as a result of the costs of projects and programs that are declining but would not be penalised for the costs of the projects and programs that are increasing.

We note the revenue impacts of one off self-insurance losses in the base year will be addressed by including self-insurance in the EBSS in the next regulatory control period. The interaction of the EBSS with a revealed cost forecasting approach means the net impact on total revenue of a self-insurance loss (or savings) in the base year is small. For example, if AusNet Services incurs a $10 million self-insurance cost in the base year, its opex forecast for the following period will be $50 million higher. However, its EBSS reward will be lower by a similar magnitude, offsetting the higher opex forecast. Similarly, if AusNet Services pays no self-insurance costs in the base year, its opex forecast going forward will be lower but it will receive an offsetting EBSS reward. When the EBSS applies, the costs of a self-insurance event will be shared between the network service provider and network consumers according to the sharing ratio in the EBSS. That is, regardless of the timing of the event, the cost will be shared approximately 30:70 between the service provider and network consumers.[49]

[49] AER, Explanatory statement, EBSS for electricity network service providers, November 2013, p. 19.

Group 3 asset roll in

During any regulatory control period, AEMO or a distribution business may request AusNet Services to augment the transmission network or distribution connection services. We do not roll these assets into the regulated asset base until the subsequent revenue determination. AusNet Services refer to these assets as 'group 3 assets'.

The opex associated with these group 3 assets is currently charged to customers outside the revenue cap and is not reflected in base opex. Consequently we need to increase our opex forecast for the additional expenses associated with the operation and maintenance of the group 3 assets that we roll into the RAB. The value of the assets being rolled into the RAB in April 2017 is $99 million ($2016–17).[50]

AusNet Services forecast the opex associated with these group 3 assets based on the change between 1 April 2014 and 1 April 2017 in the proportion of its total asset base that relates to regulated assets, which was 4.03 per cent.[51] It then used this to estimate a percentage increase in total opex by applying a weighted scale factor of 59.45 per cent. This resulted in a forecast increase in opex of 2.39 per cent in the first year of the 2017–22 regulatory control period, equal to $10 million ($2016–17) over the five year forecast.

We had concerns that this approach may not reasonably reflect the increase in efficient opex due to the roll in of group 3 assets. Specifically, AusNet Services' calculation:

- may overstate the output growth associated with the rolled in group 3 assets because the group 3 assets have not been depreciated as much as the assets already in the asset base
- is influenced by replacement capex, which does not relate to an increase in output
- is influenced by the value of unregulated assets that are not group 3 assets, which will not impact the opex associated with operating and maintaining its regulated assets.

We considered different approaches to forecasting the opex associated with these group 3 assets that would reduce the impact of these concerns. However, the opex forecast under these different approaches was not materially different to that proposed by AusNet Services. Consequently, although we do have some concerns with AusNet Services' approach, we are satisfied that the forecast opex associated with group 3 assets reasonably reflects the efficient costs of operating and maintaining these assets.

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50 In accordance with NER, cl. 11.6.21(c); AusNet Services, *Revenue proposal 2017–22, October 2015, p. 134.*

51 AusNet Services, *Revenue proposal 2017–22, October 2015, pp. 133-134.*
Includes projects completed and in service before December 2014. AusNet Services stated it may update the project list for more recent projects in a supplementary submission at the time of the Draft Decision.

A.4.4 Estimate of final year opex

To forecast opex for the 2017–22 regulatory control period we have applied our rate of change to our estimate of 2016–17 opex. However, we usually make a regulatory determination during the final year of the preceding regulatory control period and do not know actual opex for that year. Therefore, we need to forecast opex for the final year.

AusNet Services applied its proposed rate of change to base year opex to forecast opex for 2016–17 as well as the 2017–22 regulatory control period. We are not satisfied this approach produces an opex forecast consistent with the opex criteria, having regard to the opex factors. It is also not consistent with the approach outlined in the Guideline.[52]

The Guideline states we estimate final year expenditure to be equal to:[53]

$$A_f^* = F_f - (F_b - A_b) + non - recurrent\ efficiency\ gain_b$$

where:

A_f^* is the best estimate of actual opex for the final year of the preceding regulatory control period

F_f is the determined opex allowance for the final year of the preceding regulatory control period

F_b is the determined opex allowance for the base year

A_b is the amount of actual opex in the base year is the non-recurrent efficiency gain in the base year.

We apply this estimate of opex for 2016–17 when we forecast opex for the 2017–22 regulatory control period and when we calculate EBSS carryovers. This ensures AusNet Services shares efficiency gains made in 2016–17 with its network users the same as gains made in other years and as intended by the EBSS.[54] We maintain this consistency because we are required to have regard to whether the opex forecast is consistent with the EBSS when deciding whether we are satisfied that the proposed opex forecast reasonably reflects the opex criteria.[55]

We applied this equation to derive an estimated opex of $87.8 million (real 2016–17) for 2016–17, excluding easement land tax and debt raising costs.

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52 AER, *Expenditure Forecast Assessment Guideline for Electricity Transmission*, November 2013, pp. 22–23.

53 AER, *Expenditure Forecast Assessment Guideline for Electricity Transmission*, November 2013, p. 23.

54 Version one of the EBSS for transmission businesses does not allow for the non-recurrent efficiency gain adjustment to base year expenditure (version two, which will apply in the 2017–22 regulatory control period does). Consequently we did not adjust base year expenditure for any non-recurrent efficiency gains when we forecast opex for the 2017–22 regulatory control period and when we calculated EBSS carryovers.

55 NER, cl.6A.6.6(e)(8).

B Rate of Change

Once we have determined the efficient opex required in 2016–17 we apply a forecast annual rate of change to forecast opex for the 2017–22 regulatory control period. We do this to account for likely changes in demand and cost inputs for each year of the forecast period. As set out in the Guideline, the rate of change accounts for forecast:[56]

- price growth
- output growth
- productivity growth.

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

B.5 Position

We are not satisfied AusNet Services' proposed rate of change for the 2017–22 regulatory control period produces a forecast of opex that reasonably reflects the opex criteria.[57] This is because:

- AusNet Services' forecast of labour price growth overstates the cost inputs required by a prudent and efficient DNSP in the forecast period. This is due to two key reasons:
  .1. AusNet Services forecasting approach treats all services contract expenditure as labour. This assumes that the price change of contractors' non-labour inputs is the same as their labour inputs. We do not consider this is a reasonable assumption.
  .2. AusNet Services relies on now outdated forecasts of WPI growth for the Victorian utilities industry that overstate the expected growth in labour prices.
- AusNet Services' output growth forecast incorrectly assumes that the increase in opex due to output growth that occurs in the 2017–22 regulatory control period will be incurred by AusNet Services. However, under existing arrangements, AEMO will fund the operation and maintenance of new augmentation and connection assets during 2017–22 regulatory control period.
- AusNet Services' productivity growth relies on now outdated forecasts of productivity growth.

Since we are not satisfied that AusNet Services' proposed rate of change will produce a total opex forecast consistent with the opex criteria, we must not accept it and we must develop our own estimate.[58] Our estimate of the rate of change forecasts:

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

[57] NER, cl. 6A.6.6(c).

- labour price growth based on the forecast growth in the WPI for the Victorian electricity, gas, water and waste services (utilities) industry. We have used the average of the Victorian utilities WPI forecasts from Deloitte Access Economics (DAE) and the Centre for International Economics (CIE). Adopting expert advice from Economic Insights, we have applied input price weights of 62 per cent for labour and 38 per cent for non-labour, which reflect the weights of an efficient benchmark firm, to forecast total price change.
- output growth of zero based on the fact that AusNet Services will not incur the increase in opex due to output growth that occurs in the 2017–22 regulatory control period.
- forecast productivity growth of 0.2 per cent, based on advice from Economic Insights that relies on the most up to date forecasts available.[59]

We consider that applying our method to derive an alternative estimate of opex will result in a forecast that reasonably reflects the efficient and prudent costs faced by AusNet Services given a realistic expectation of demand forecasts and cost inputs because:

- our labour price growth measure reasonably reflects current and forecast economic conditions
- our labour and non-labour price weights reasonably reflect the benchmark efficient mix of labour services and other costs required to provide transmission services
- our forecast of output growth recognises that AusNet Services' will not incur the costs associated with operating and maintaining new augmentation and connection assets (including group 3 assets)
- our productivity growth forecast is based on the most up to date available information.

Our forecast of the overall rate of change used to derive our alternative estimate of opex is lower than AusNet Services' over the forecast period. Table B.1 shows AusNet Services' and our overall rate of change in percentage terms for the 2017–22 regulatory control period.

The differences in the forecast rate of change components are:

- our forecast of annual price growth is on average 0.20 percentage points lower than AusNet Services'
- our forecast of annual output growth is on average 1.56 percentage points lower than AusNet Services'
- our forecast of annual productivity growth is on average 0.08 percentage points lower than AusNet Services'.

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[58] NER, cll. 6A.6.6(d), 6A.14.1(3)(ii).

[59] Economic Insights, Memorandum, TNSP MTFP results, 29 April 2016, p. 5.

We discuss the reasons for these differences below.

Table B.1 AusNet Services and AER rate of change (per cent)

	2017–18	2018–19	2019–20	2020–21	2021–22	Average
AusNet Services	2.21	1.94	1.93	1.99	2.01	2.02
AER	0.09	0.31	0.40	0.43	0.43	0.33
Difference	**–2.12**	**–1.62**	**–1.53**	**–1.56**	**–1.57**	**–1.68**

Source: AER analysis.

B.6 AusNet Services proposal

Table B.2 shows AusNet Services' proposed cumulative change in opex for each rate of change component reported in its reset RIN.

Table B.2 AusNet Services proposed opex by rate of change drivers ($ million, 2016–17)

	2017–18	2018–19	2019–20	2020–21	2021–22	Total
Price growth	1.4	2.0	2.6	3.2	3.9	**13.0**
Output growth	4.1	5.4	6.7	8.1	9.4	**33.7**
Productivity growth	–0.7	–0.9	–1.2	–1.4	–1.6	**–5.8**

Source: AusNet Services reset RIN table 2.16.1.

We discuss how AusNet Services forecast each of the rate of change components below.

Forecast price growth

AusNet Services proposed price growth for:[60]

- **internal labour costs (44 per cent):** AusNet Services used the forecasts growth in the wage price index (WPI) for the electricity, gas, water and waste services (utilities) industry, as forecast by the Centre for International Economics (CIE) and Deloitte Access Economics (DAE)
- **external labour costs (34 per cent):** AusNet Services used the forecasts growth in the WPI for the construction industry, as forecast by CIE

[60] AusNet Services, *Regulatory proposal*, 30 October 2015, pp. 127–129.

- **non-labour costs (22 per cent):** AusNet Services considered it was appropriate to assume that these costs will increase at the same rate as CPI and therefore did not forecast real price growth for its non-labour costs.

AusNet Services weighted these based on its actual expenditure in the base year.

Table B.3 shows AusNet Services' annual percentage change for each of its proposed price growth categories.

Table B.3 Proposed price growth, per cent, real

	2017–18	2018–19	2019–20	2020–21	2021–22
Internal labour	0.81	0.81	0.83	0.90	0.91
External labour	1.04	1.04	1.01	1.09	1.12
Non-labour	–	–	–	–	–

Source: AusNet Services, *Revenue proposal*, 30 October 2015, p. 128.

Forecast output growth

AusNet Services stated that the rate of change should account for the impact of increased outputs over the 2017–22 regulatory control period. For instance, the growth in energy and demand from 2017–18 to 2021–22 is a proxy for growth in network size, which drives increases in operating and maintenance costs.[61]

AusNet Services stated that it adopted our forecasting method for output growth. In particular, it considered our output measures are reasonable drivers of opex increases over the 2017–22 regulatory control period. It forecast these as follows:

- **energy throughput (with a weight of 21.4 per cent):** based on advice from AEMO, the Victorian transmission network planner
- **ratcheted maximum demand (22.1 per cent):** based on advice from AEMO
- **voltage-weighted entry and exit points (27.8 per cent):** based on average growth between 2006 and 2014 in the number of transmission node identifiers (TNIs), weighted by the voltage of each TNI
- **circuit length (28.7 per cent):** No growth, other than an increase in 2017–18 that reflects an additional circuit from Ballarat to Moorabool, as advised by AEMO.

Table B.4 Proposed output growth, per cent

	2017–18	2018–19	2019–20	2020–21	2021–22
Energy throughput	1.00	1.00	1.00	1.00	1.00

[61] AusNet Services, *Regulatory proposal*, 30 October 2015, p. 125.

Ratcheted maximum demand	1.00	1.00	1.00	1.00	1.00
Weighted entry and exit connections	3.83	3.83	3.83	3.83	3.83
Circuit length	0.97	–	–	–	–
Output growth	**1.78**	**1.50**	**1.50**	**1.50**	**1.50**

Source: AusNet Services, *Revenue proposal*, 30 October 2015, p. 126.

Forecast productivity growth

AusNet Services stated that an historical average of industry-wide productivity gains represents a reasonable proxy for the future productivity improvements an efficient TNSP would be expected to achieve in the future. It engaged Huegin Consulting to calculate average industry productivity using the most up to date information available.[62]

Huegin found that over the period 2006 to 2014 average annual industry productivity change was 0.28 per cent. AusNet Services adopted this as its forecast of productivity growth.[63]

B.7 Assessment approach

As discussed above, we assess the annual change in expenditure in the context of our assessment of AusNet Services' proposed total forecast opex.

The rate of change itself is a build-up of various components to provide an overall number that represents our forecast of annual change in overall required opex during the 2017–22 regulatory control period. The rate of change approach we have adopted takes into account the forecast growth in the outputs the service provider will be required to deliver. We then derive the forecast growth in the inputs required to deliver those outputs from the forecast growth in productivity. We then use this to forecast the rate of change in opex from the forecast growth in the price of inputs.

The rate of change equals:

$$(1 + \text{price growth}) \times (1 + \text{output growth}) \times (1 - \text{productivity growth}) - 1$$

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

62 AusNet Services, *Regulatory proposal*, 30 October 2015, p. 130.

63 AusNet Services, *Regulatory proposal*, 30 October 2015, pp. 130–131.

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 growth component of the rate of change, whereas we consider this to be productivity growth. 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.

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, how we define our inputs will affect both forecast price growth, which is the growth in the price of those inputs, as well as forecast productivity change, which reflects the quantity of those inputs required to deliver the forecast outputs.

B.7.1 Price growth

Under our rate of change approach we escalate opex by the forecast change in prices. Price growth includes both labour price growth and non-labour price growth. Price growth accounts for the price of key inputs that do not move in line with the CPI and form a material proportion of AusNet Services' expenditure.

To determine the appropriate forecast change in labour prices we assessed forecasts from CIE and Deloitte Access Economics. These consultants base these forecasts on their views of general macroeconomics trends for the utilities industry and the overall Australian economy. We discuss our consideration of the choice of labour price forecast below in section B.8.1.

B.7.2 Output growth

Output growth captures the change in expenditure due to changes in the level of outputs delivered, such as increases in the size of the network and the customers 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. We consider any subsequent adjustment for economies of scale as a part of our assessment of productivity growth.

We discuss how we have estimated output growth in section B.8.2.

B.7.3 Productivity

We forecast productivity growth based on our expectations of the productivity an efficient service provider in the transmission industry can achieve. We consider the historic growth in productivity, and whether this reflects a reasonable expectation of the benchmark productivity growth that can be achieved in the forecast period.

If inputs increase at a greater rate than outputs then a service provider's productivity is decreasing. Productivity growth can have different sources. For example, productivity growth 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.

In the explanatory statement to the Guideline we noted that we would apply a rate of change to our estimate of final year opex (taking into account an efficiency adjustment, if required), to account for the shift in the productivity frontier over the forecast period.[64]

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 reflected 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.[65]

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

We discuss how we have estimated productivity growth in more detail in section B.8.3.

B.8 Reasons for position

For the reasons we discuss below, we are not satisfied that AusNet Services' approach to forecasting the rate of change will provide an opex forecast that reasonably reflects the opex criteria. We, therefore, have not accepted AusNet Services' proposal and forecast our own estimate of the rate of change. Our estimate is lower than that proposed by AusNet Services due to AusNet Services' higher forecast price growth and output growth. We have also forecast lower productivity growth than that forecast by AusNet Services.

Table B.5 shows AusNet Services' and our overall rate of change and each rate of change component for each regulatory year of the 2017–22 regulatory control period.

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64 AER, *Better regulation explanatory statement expenditure forecast assessment guideline*, November 2013, p. 65.

65 AER, *Better regulation explanatory statement expenditure forecast assessment guideline*, November 2013, p. 66.

Table B.5 AusNet Services and AER rate of change (per cent real)

	2016	2017	2018	2019	2020	Average
AusNet Services revised proposal						
Price growth	0.70	0.71	0.70	0.76	0.78	0.73
Output growth	1.78	1.50	1.50	1.50	1.50	1.56
Productivity growth	0.28	0.28	0.28	0.28	0.28	0.28
Overall rate of change	**2.21**	**1.94**	**1.93**	**1.99**	**2.01**	**2.02**
AER						
Price growth	0.29	0.51	0.60	0.63	0.64	0.54
Output growth	–	–	–	–	–	–
Productivity growth	0.20	0.20	0.20	0.20	0.20	0.20
Overall rate of change	**0.09**	**0.31**	**0.40**	**0.43**	**0.43**	**0.33**
Overall difference	**–2.12**	**–1.62**	**–1.53**	**–1.56**	**–1.57**	**–1.68**

Source: AER analysis.

In estimating our rate of change, we considered AusNet Services' proposed forecast growth in prices, output and productivity and the method used to forecast these. The key areas of difference with AusNet Services are:

1. **Forecast labour price growth:** We and AusNet Services both used the forecast growth in the WPI for the electricity, gas, water and waste services industry (the utilities industry) as forecast by DAE and CIE. However, we have used the most up-to-date forecasts available from these forecasters.
2. **Input price weights:** AusNet Services applied a higher weighting to labour price growth, based on its actual expenditure in 2014, that treated all services contract expenditure (both field services and non-field services) as labour. By contrast, to better reflect the nature of the services, we used a benchmark weighting that treated field services labour as a mix of labour and non-labour and non-field services as non-labour.
3. **Forecast output growth:** AusNet Services applied our standard approach to forecasting output growth for transmission business. However, we forecast no additional opex due to output growth because AusNet Services will not need to fund the cost of operating and maintaining augmentation and connection assets installed in the 2017–22 regulatory control period as AEMO will incur this cost.
4. **Productivity growth:** AusNet Services adopted our standard approach to measure productivity growth from 2006 to 2014. In order to more accurately measure productivity growth, we used an additional year of data (2015), and made a small number of revisions to the data. We also used a trend growth rate method rather than the average annual growth rate method used by AusNet Services.

We have separated the sections below into the three rate of change components. Where relevant we compare these components to AusNet Services' proposed rate of change using information provided in its reset RIN and opex model.

B.8.1 Forecast price growth

We are not satisfied AusNet Services' proposed average annual price growth of 0.7 per cent for the 2017–22 regulatory control period reflects the increase in prices a prudent and efficient service provider would require to meet the opex objectives. We forecast an average annual price growth of 0.5 per cent.

There are three main differences between AusNet Services' approach to forecasting price growth and the approach we have adopted. We discuss our consideration of each of these issues below.

Choice of price measures

We have forecast labour price growth based on the growth in the utilities WPI. We have forecast no non-labour price growth in real terms. We then apply benchmark weights to derive our forecast of overall opex price growth.

AusNet Services proposed price growth for:[66]

- internal labour costs (utilities WPI growth)
- external labour costs (construction WPI growth)
- non-labour costs (CPI growth).

AusNet Services defined internal labour costs as the costs of AusNet Services' employees and its internal labour hire. It defined external labour costs as the costs of external contractors engaged to deliver services such as asset maintenance, as well as consultants.[67]

We compare the price measures we have used to forecast price change with those used by AusNet Services in Table B.6 below.

Table B.6 Comparison of price measures used

	AusNet Services	AER
Internal labour	Utilities WPI	Utilities WPI
Field services, labour	Construction WPI	Utilities WPI
Field services, non-labour	Construction WPI	CPI
Non-field services	Construction WPI	CPI

66 AusNet Services, *Regulatory proposal*, 30 October 2015, pp. 127–129.

67 AusNet Services, *Regulatory proposal*, 30 October 2015, p. 127.

Other	CPI	CPI

Source: AusNet Services, Regulatory proposal, 30 October 2015, pp. 127–129.

There are two key differences between our input price measures and AusNet Services':

1. AusNet Services treated contracted services as a labour cost whereas we treat these services as a mix of labour and non-labour costs
2. AusNet Services forecast external labour prices to grow at the same rate as the construction industry WPI whereas we have forecast all labour to grow at the same rate as the utilities WPI.

We discuss our reasons for these two differences below.

Contracted services have inputs other than labour

In order to forecast the rate of change using the opex forecasting method set out in the Guideline, we need to define the inputs. This is required to forecast price change and productivity change. Opex inputs can be generally classified as labour, services or materials.

The key difference between our definition of labour expenditure and AusNet Services' is that AusNet's includes all services contracts expenditure (both field services and non-field services) in its labour weight. Unlike AusNet Services, we have treated non-field services contracts as services and thus included them in our non-labour component. We only included the labour component of field services contracts in our labour weight.

By defining labour this way we include the productivity related to providing field services in the productivity component of the opex cost function. This is true for both our measurement of historic productivity growth and the forecast productivity growth in our opex forecast. We do this because when we measure historic productivity growth we want to include the productivity growth achieved by contractors providing services that define electricity transmission in our productivity growth forecast. We do not include the productivity growth achieved by contractors providing services that are not unique to electricity transmission in our productivity growth forecast.

As noted above, AusNet Services includes all non-field services contracts expenditure in its labour weight. At this point it is important to make the distinction between the price of a service and the price of labour. Here we are considering the appropriate price measure to apply to non-field services. It would be inappropriate to use the price of labour when we are forecasting the price of the service. The WPI proposed by AusNet Services does not reflect the price of non-field services. Using WPI growth for non-field services would ignore the growth in the price of other inputs used to deliver those services as well as the productivity growth achieved delivering these services. AusNet's proposal is not, therefore, a reasonable alternative to our approach.

The ABS publishes data on the movement in the price of goods and services. It publishes producer price indices for different industries as both input price indices and output price indices. That is, it publishes indices of the prices of inputs used by an industry and the prices of outputs produced by an industry. We looked at the output producer price indices that most closely reflect the non-field services that an efficient service provider would purchase (Table B.7). These are the same producer price indices that we use for the price of non-labour inputs in our opex cost function modelling that we use to measure historic productivity growth.

Table B.7 Annual growth in the producer price indices of selected ANZSIC classifications

Index	Annual growth
All industries, domestic, intermediate inputs	2.9
Data processing, web hosting and electronic information storage services	1.0
Other administrative services	2.7
Legal and accounting services	3.8
Market research and statistical services	4.0
Weighted average producer price index*	2.6
Consumer price index	2.8

* We calculated the weighted average using the same weights used by Economic Insights in its opex cost function modelling.

Note: We measured annual growth over the period September 2001 to September 2014.

Source: ABS catalogue 6427.0.

This analysis suggests that while the cost of some non-field services has increased by more than CPI others have increased by less than CPI. However, the price growth of non-field services tends to grow at a similar rate to CPI. Having reviewed the historic change in various producer price indices we found no evidence that the price of the non-field services purchased from contractors by an efficient service provider varies materially from CPI.

Similarly for field services, it is not appropriate to assume the price of the inputs field services contractors use will all change at the same rate as labour prices. Field services contractors have inputs other than labour. For example, field services contractors will require inputs such as:

- tools and other equipment used to provide the field services
- materials used to provide the field services
- vehicles including insurance, registration, fuel and servicing
- owning or leasing offices and other buildings and maintaining them.

AusNet Services' assumption ignores the price change of these other inputs. AusNet Services effectively assumes that field services contractors have only one input, which

is labour. This is not a reasonable assumption. As distinct from non-field services, however, we are interested in the price change of field services inputs, rather than the price of field services, because we capture the productivity growth in delivering field services contracts in our productivity growth forecast.

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

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

The construction WPI is not the appropriate price measure for contracted services labour prices

AusNet Services' stated that it forecast external labour price growth using the construction WPI because the labour of most contractors in transmission undertakes construction-like work that is more suitably classified to the construction sector. It stated this was particularly the case in major terminal station rebuilds which often involve significant general labour, project management and civil engineering resources, drawing upon labour from the construction market. It therefore considered the construction WPI more accurately reflects the growth in its external labour prices.[68]

We note that the ABS does state that:[69]

> Units mainly engaged in the construction of water, gas, sewerage or stormwater drains or mains, electricity or other transmission lines or towers, pipelines, or any other civil engineering projects are included in Division E Construction.

Consequently it is clear that labour engaged in the construction of electricity transmission networks is included in the construction industry by the ABS. However, here we are considering the price measure that best reflects the price of labour used

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[68] AusNet Services, *Regulatory proposal*, 30 October 2015, p. 129.

[69] http://www.abs.gov.au/ausstats/abs@.nsf/Product+Lookup/73F4863F0CDC7D4CCA257B9500133B80?opendocument

by field services contractors to assist an efficient service provider to operate and maintain its network. The price of labour used to construct the network is not a relevant consideration for opex price growth. Consequently we use the forecast growth in the utilities industry WPI for forecast the growth in the price of labour used by field services contractors. We consider that this measure best reflects the price of labour used by field services contractors undertaking operating and maintenance activities. This is also consistent with how we, and AusNet Services, have defined labour to measure historic productivity growth. Similarly, the CCP considered forecast WPI growth for the construction industry was not applicable and that forecast WPI growth for the utilities industry was more appropriate.[70]

Firm specific price weights do not provide an incentive to adopt the most efficient input mix

We have weighted the forecast price growth to account for the proportion of opex that is labour and the proportion that is non-labour. We have adopted a 62 per cent weighting for labour and 38 per cent for non-labour. These weights are consistent with those used by Economic Insights' to measure the historic productivity growth that we have used to forecast productivity growth.

We consider that we should base the price weights we use to forecast price growth on a prudent and efficient benchmark network service provider. Using benchmark price weights provides service providers an incentive to make efficiency gains by adopting the most efficient input mix. Using a firm's revealed input mix diminishes its incentive to adopt the most efficient input mix. Weights of 62 per cent for labour and 38 per cent for non-labour represent the best available estimate available for the benchmark efficient firm, as advised by Economic Insights.[71] These weights are also consistent with those used in Economic Insights' benchmarking analysis.

AusNet Services, however, considered that using benchmark input weights is inconsistent with an opex forecasting approach that relies on revealed costs. It stated that it has responded to the incentives in the regulatory framework and has sought to adopt an input mix that allows it to meet the opex objectives at the lowest possible cost. It considered adopting benchmark input weights implicitly assumes that these regulatory incentives are not effective. It also considered adopting firm specific revealed weights ensures internal consistency with our revealed costs based-step-trend forecasting approach.

We disagree with AusNet Services. As we explain below, adopting benchmark input weights does not assume that the regulatory incentives are ineffective. Further, adopting firm specific revealed weights is not consistent with our revealed costs base-step-trend forecasting approach.

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70 CCP, *Submission in response to AusNet Services' 2017–22 transmission determination proposal*, February 2016, p. 29.

71 Economic Insights, *Memorandum, Opex input price index weights*, 19 February 2016.

The ex-ante opex allowance, our revealed cost forecasting approach and the EBSS work together to provide firms a continuous incentive to minimise opex. However, if a firm knew we would use its revealed input mix to forecast the rate of change then it would have an incentive to increase its use in the base year of the input that will increase in price more rapidly. As noted by Economic Insights, using the best estimate available of the appropriate weights of labour and non–labour components of opex and applying these to all firms, removes the incentive to skew either actual, or reported, opex composition towards components with faster growing prices.[72]

Furthermore, analysis previously undertaken by Mr Jeff Balchin, and submitted to the AER by Electranet, shows that:[73]

> …it is inappropriate and inconsistent with the incentive framework for the assumed trend or trajectory after the base year to be based upon the observed performance in the preceding regulatory period.

Mr Balchin's analysis shows that using a firm's revealed input mix provides a disincentive to use less of an input that is increasing more rapidly in price because it would reduce the forecast rate of change. Consequently using a firm's revealed input mix is inconsistent with providing effective incentives in order to promote economic efficiency.[74]

Using benchmark input weights does not necessarily infer or assume that AusNet Services' revealed input mix is inefficient. Again it is important to consider the interaction between price growth and productivity. Two firms could adopt different opex input mixes with one firm utilising more labour than the other. This firm could face higher input price growth due to, for example, the price of labour increasing more rapidly than the price of services. This firm could achieve higher productivity growth because the labour it was directly employing was driving productivity growth. The other firm could face lower price growth because the same productivity growth was reflected in the price it paid for services because it did not directly employ the labour. This highlights the importance of using consistent opex weights in the price growth forecast and the productivity growth forecast. AusNet Services proposal is not consistent in this regard. It uses benchmark opex weights to measure productivity growth but uses firm specific weights to forecast price change. Because it applies a higher weight to the input increasing in price more rapidly when forecasting price change this results in its rate of change overstating the efficient costs of achieving the opex objectives.[75]

Forecast labour price growth

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72 Economic Insights, *Memorandum to AER, Opex input price index weights*, 19 February 2016, p. 8.

73 PWC, *Operating expenditure efficiency assumption and the efficiency benefit sharing scheme*, 16 January 2013, p. 6.

74 NEL, s. 7A(3).

75 NER, cl. 6A.6.6(c)(1).

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

AusNet Services engaged CIE to develop forecasts of growth in the WPI for the utilities and construction industries. To forecast labour price growth AusNet Services averaged CIE's June 2015 forecasts with DAE's February 2015 forecasts. Both of these forecasters have produced more up-to-date forecasts since. We compare these forecasts with the updated forecasts in Table B.1.

Table B.8 Forecast annual WPI growth, Victoria, EGWWS (per cent, real)

	2017–18	2018–19	2019–20	2020–21	2021–22
DAE, February 2016	–0.03	0.61	0.94	1.07	1.08
CIE, November 2015	0.98	1.04	1.01	0.96	0.95
Average	**0.47**	**0.83**	**0.97**	**1.02**	**1.01**
CIE, June 2015	1.16	1.12	1.08	1.19	1.22
DAE, February 2015	0.45	0.50	0.58	0.60	0.60
Average	**0.81**	**0.81**	**0.83**	**0.90**	**0.91**

Note: DAE's February 2015 forecasts did not include forecast for Victoria. AusNet Services used DAE's February 2015 national WPI forecasts. Where the forecast series does not extend far enough we have assumed that growth in all years after the last forecast year is the same as the last forecast year.

Source: AER analysis; CIE, *Labour price forecasts*, 29 June 2015, p. 3; DAE, *Forecast growth in labour costs in NEM regions of Australia*, 23 February 2015, p. 9; CIE, *Labour price forecasts*, 23 November 2015, p. 7; DAE, *Forecast growth in labour costs in NEM regions of Australia*, 22 February 2016, p. 5;

We note that AusNet Services stated in its regulatory proposal for its distribution network:

> In recognition that economic data is subject to change between now and the commencement of the regulatory control period, and that the best forecast of labour costs will be based on the most up to date data set available, AusNet Services will provide an updated labour cost forecast in its Revised Proposal that incorporates the most recently available economic data. (page 187 of distribution proposal)

We agree that the best forecast of labour price growth should be based on the most up to date data set available. For this reason we have used the forecasts from DAE's and CIE's most recent forecasts. We also intend to update these forecasts for our final decision.

B.8.2 Forecast output growth

We are not satisfied that AusNet Services proposed output growth reasonably reflects the increase in efficient opex a prudent service provider requires to meet the opex objectives. This is because AusNet Services is not required to fund the operation and maintenance of new augmentation and connection assets, including group 3 assets, from its opex allowance.

Our standard approach to forecasting output growth

Our standard approach to forecasting output growth for electricity transmission networks uses the output specification developed by Economic Insights. Economic Insights used an index based number approach to estimate 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.[76]

Economic Insights measured the cost elasticities of each the outputs, which we then use to weight each of the output measures and forecast total output growth. The outputs and weights are as follows:[77]

- energy delivered (21.4 per cent)
- ratcheted maximum demand (22.1 per cent)
- voltage weighted entry and exit connection points (27.8 per cent)
- circuit length (28.7 per cent).

Economic Insights chose these outputs based on the three selection criteria that we set out in our explanatory statement to the Guideline.[78] As such, the outputs align with the NEL and NER objectives, reflect services provided to customers and are significant.[79]

AusNet Services adopted this output specification to forecast output growth in its revenue proposal. Consequently AusNet Services assumed that it would incur all the costs associated with output growth. We discuss below whether this is a reasonable assumption.

AusNet Services will not incur opex related to new augmentation or connection assets

During any regulatory control period, AEMO or a distribution business may request AusNet Services to augment the transmission network or distribution connection

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

[77] Since we do not forecast reliability to change we apply a weighting of zero for the forecast period.

[78] Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and Tasmanian Electricity TNSPs*, 6 November 2014, p. 7.

[79] AER, *Expenditure forecast assessment guideline: Explanatory statement*, November 2013, p. 145.

services. We do not roll these assets into the regulated asset base until the subsequent revenue determination. AusNet Services refer to these assets as ‘Group 3 assets’.

The opex associated with these group 3 assets is currently charged to customers outside the revenue cap and is not reflected in AusNet Services' base opex. We discuss in appendix A how we account for the additional opex associated with the operation and maintenance of the group 3 assets that we roll into the RAB.

The EUCV considered that the output growth proposed by AusNet Services is not appropriate because AusNet is not responsible for augmentation of the network. The EUCV noted that AusNet Services' proposal to increase opex for the inclusion of group 3 assets and to also include output growth was effectively double counting. Overall the EUCV considered that, due to the unique circumstances of the way the Victorian transmission network is operated, we should not adjust opex for output growth other than to include opex directly associated with the transfer of augmentation assets into AusNet Services' asset base (such as the Group 3 assets).[80]

We agree with the EUCV. AusNet Services will not require additional opex to inspect, assess the condition of and maintain new assets installed in the 2017–22 regulatory control period. Therefore our standard approach to forecasting output growth, as proposed by AusNet Services, will overstate any increase in opex due to output growth during the 2017–22 regulatory control period.

In its revenue proposal for the 2014–17 regulatory control period AusNet Services proposed no additional opex for any increase in output growth during the 2014–17 regulatory control period. It only proposed output growth due to the roll in of group 3 assets. Based on AusNet Services' proposal we also did not include additional opex for output growth during the 2014–17 regulatory control period.

We remain satisfied that forecast opex does not require additional opex for output growth for it to reasonably reflect the opex criteria. This is because AusNet Services does not need to fund the operation and maintenance of new augmentation and connection assets through their opex allowance.

We also note that we are not satisfied that AusNet Services' forecasts of the individual output measures reasonably reflect the expected growth in these measures, notwithstanding that the growth in these measures does not influence our opex forecast.

AusNet Services' forecasts of growth in energy delivered, ratcheted maximum demand and voltage-weighted entry and exit connection points do not reconcile with:

- AEMO's forecasts of energy delivered in its 2015 *National electricity forecasting report*

[80] EUCV, *Submission in response to AusNet Services' 2017–22 transmission determination proposal*, February 2016, p. 32.

- AEMO's forecast growth in non-coincident summer demand with a probability of exceedance of 50 per cent, in its connection point forecasts
- the fact there are only a relatively small number of connection points on AusNet Services' transmission network and there are significant lead times to add new connection points or upgrade the voltage of existing connection points. AusNet Services did not identify any specific projects that would drive its forecast growth in voltage weighted entry and exit connection points. We have reviewed AEMO's 2015 *Victorian annual planning report* and consider it does not support forecast growth consistent with an historic average. Further, the voltage weighted number of entry and exit connection points, based on the connection points published in AEMO's annual *Regional boundaries and marginal loss factors* reports, has not grown since 2012–13.

B.8.3 Forecast productivity growth

In the Guideline we stated 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.[81] Consistent with this we have used the electricity transmission industry average opex partial productivity growth rate from 2006 to 2015 of 0.2 per cent to forecast AusNet Services' opex productivity growth. We based this figure on analysis undertaken by our consultant, Economic Insights.

We base our productivity growth forecast on a business as usual scenario. This assumes there will be no significant structural change in the electricity transmission industry for the 2017–22 period relative to the 2006–15 time period used to measure historic productivity growth. Previously Economic Insights considered the extrapolation of the electricity transmission industry opex partial productivity growth rate to be reasonable in a 'business as usual' scenario.

Consistent with our approach, AusNet Services stated that it considers that 'a historical average of industry-wide productivity gains represents a reasonable proxy for the future productivity improvements an efficient TNSP would be expected to achieve in the future.'[82] AusNet Services engaged Huegin Consulting to measure industry average productivity growth using the most up to date information available to it, using data that we have collected and published.[83] Based on Huegin Consulting's analysis, AusNet Services forecast productivity growth of 0.28 per cent each year.[84]

AusNet Services' productivity growth forecast of 0.28 per cent is similar to our own forecast of 0.20 per cent. There are three drivers of the small differences between these forecasts:[85]

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

82 AusNet Services, *Regulatory proposal*, 30 October 2015, p. 130.

83 AusNet Services, *Regulatory proposal*, 30 October 2015, pp. 125, 130.

84 AusNet Services, *Regulatory proposal*, 30 October 2015, p. 130.

85 Economic Insights, *Memorandum: TNSP MTFP Results*, 29 April 2016, pp. 1–2.

1. Economics Insights used an additional year of data (2015) in its latest TNSP analysis
2. we made a small number of revisions to the data used by Economic Insights in its analysis, most of which related to the voltage–weighted entry and exit points output variable and the MVA rating of lines
3. Economic Insights used the trend growth rate method, rather than the average growth rate method, to measure historic productivity growth.

We have used the trend growth rate method rather than the average growth rate method to measure historic productivity growth based on advice from Economic Insights.

The average annual growth rate method measures the grow rate between the first and last observations. The regression–based trend method determines a line of best fit through all the data points. As noted by Economic Insights, both methods have advantages and disadvantages. The average growth rate method has the advantage of tracking movement in the index exactly between the two endpoints of the series. However, outlier observations lying at either the start or the end of the data series will influence the measured growth rate. If changes in opex driving these outlier observations are one–off events then these observations may produce an average growth rate that is not reflective of the underlying trend change over the time period.[86]

The trend growth rate method, on the other hand, will more closely reflect the underlying trend rate of growth over the entire period. It will not track the series from endpoint to endpoint exactly, however. An advantage of the trend method is that it moderates the impact of sudden changes in opex levels.[87]

As noted by Economic Insights, opex partial productivity trended up from 2006 to 2013 before falling in 2014 and 2015. There is some evidence that at least part of these recent falls reflect one-off events. We note that Powerlink was a significant contributor to the fall in opex productivity in 2015, with its productivity falling 10 per cent. In its revenue proposal, Powerlink reduced its reported opex in 2015 by 12.6 per cent to allow for non–recurrent factors as part of the process of forming its base year opex to forecast opex.[88]

Consequently Economic Insights considered the trend method is more appropriate for measuring opex productivity growth because it more closely reflects the underlying trend movement in TNSP opex productivity over the historic period. Economic Insights considered that, as a result, it will provide a better forecast of opex productivity growth over the next regulatory period.[89] We agree with Economic Insights that we should use

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86 Economic Insights, *Memorandum: TNSP MTFP Results*, 29 April 2016, p. 5.
87 Economic Insights, *Memorandum: TNSP MTFP Results*, 29 April 2016, p. 5.
88 Economic Insights, *Memorandum: TNSP MTFP Results*, 29 April 2016, p. 5.
89 Economic Insights, *Memorandum: TNSP MTFP Results*, 29 April 2016, p. 5.

the trend method to measure productivity growth because it is less sensitive to outlier values in the first or last years of the data series.

C Step changes

In assessing the service provider's opex forecast we recognise that there may be changed circumstances in the forecast period that may impact the expenditure requirement of a service provider. We consider those changed circumstances as potential 'step changes'.

We typically allow step changes for changes to ongoing costs associated with new regulatory obligations and for efficient capex/opex trade-offs. Step changes may be positive or negative.

This appendix sets out our consideration of step changes in determining our opex forecast for AusNet Services for the 2017–22 regulatory control period.

C.1 Position

We have not included any step changes in our opex forecast. We are not satisfied that cost increases AusNet Services identified are required in order to arrive at a forecast of total opex that reasonably reflects the opex criteria. We outline a summary of the revenue impact of AusNet Services' proposed step changes in Table C.1.

Table C.1 Draft position on step changes ($ million, 2016–17)

	AusNet Services proposal	AER draft decision
Establishment of IT security team	3.3	0.0
New emergency response arrangements	1.0	0.0
Smart Aerial Image Processing (SAIP) roll out	0.9	0.0
WMTS mobile switchboard	2.0	0.0
Synchronous condensers	4.3	0.0
Morwell Power Station assets	1.9	0.0
Total	**13.5**	**0.0**

Source: AusNet Services, *Revenue proposal 2017–22*, October 2015; AER analysis.

C.2 AusNet Services' proposal

AusNet Services proposed six step changes to its base level of opex, totalling $13.5 million ($2016–17) or 2.7 per cent of its total opex forecast (excluding easement land tax).[90] The proposed step changes are to:

- establish an IT security team

[90] AusNet Services, *Revenue proposal 2017–22, section 5.10,* October 2015, p. 135, and, *Attachment 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 5.

- implement new emergency response arrangements
- roll out Smart Aerial Image Processing (SAIP)
- commission a West Melbourne Terminal Station (WMTS) mobile switchboard
- decommission synchronous condensers at the Fishermans Bend, Brooklyn and Templestowe Terminal Stations
- decommission transmission assets at Morwell Power Station (MPS).

C.3 Assessment approach

Our assessment of proposed step changes must be understood in the context of our overall method of assessing total required opex using the 'base-step-trend' approach. When assessing a service provider's proposed step changes, we consider whether they are needed for the total opex forecast to reasonably reflect the opex criteria. We specified our assessment approach in the Guideline and more fully describe it in section 7.3 of this attachment.

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

We generally consider an efficient base level of opex (rolled forward each year with an appropriate rate of change) is sufficient for a prudent and efficient service provider to meet all existing regulatory obligations. This is the same regardless of whether we forecast an efficient base level of opex based on the service provider's own costs or the efficient costs of comparable benchmark providers. We only include a step change in our opex forecast if we are satisfied a prudent and efficient service provider would need an increase in its opex to reasonably reflect the opex criteria.

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.

For example, a step change should not double count the costs of increased volume or scale compensated through the forecast growth 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. To give another 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 which includes office maintenance) to account for forecast output growth.

By applying the rate of change to the base year opex, we also 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 do not 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 opex items for which the price may be 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 opex as a whole will be too high.

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

- whether there is a change in circumstances that affects the level of expenditure a prudent service provider requires to meet the opex objectives efficiently
- what options were considered to respond to the change in circumstances
- whether the option selected was the most efficient option—that is, whether the service provider took appropriate steps to minimise its expected cost of compliance
- the efficient costs associated with 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 control 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 use contractors). Step changes should generally relate to a new obligation or some change in the service provider's operating environment beyond its control in order to be expenditure that reasonably reflects the opex criteria. 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 increases in costs are not required for discretionary changes in inputs. 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 an increase in its total opex to finance the new IT since the outlay should be at least offset by a reduction in other costs if it is efficient. 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 to total opex may be required is when a service provider chooses an operating solution to replace a capital one. For example, it may choose to lease vehicles when it previously purchased them. For these capex/opex trade-off step changes, we will assess whether it is prudent and efficient to substitute capex for opex or vice versa. In doing so we will assess whether the forecast opex over the life of the alternative capital solution is less than the capex in NPV terms.

C.4 Reasons for preliminary decision

C.4.1 Establishment of IT security team

We have not included an increase in opex to establish an IT security team in our alternative opex forecast.

AusNet Services forecast an increase in opex of $3.3 million ($2016–17) to establish an IT security team against cyber-attack.[91] It stated the step change was to comply with a new or changed regulatory obligation. The step change is to align its IT security program with the Australian Securities and Investments Commission's (ASIC's) view of global industry best practice.

We do not consider this step change is driven by a new or changed regulatory obligation.

In March 2015, ASIC published its Cyber resilience: Health Check report, recommending a cyber-security framework for ASX-listed organisations.[92] This framework is the U.S. National Institute of Standards and Technology Cyber Security Framework for Critical Infrastructure (NIST-CSFCI). AusNet Services proposed expenditure to establish a dedicated security monitoring and response team to align its IT security program with NIST-CSFCI. AusNet Services stated:

> While not a regulatory obligation per se, adopting NIST would align AusNet Services' IT security program with global industry best practice.[93]

AusNet Services also considers the forecast expenditure complies with the NER, given the potential impact of a successful cyber-attack on the reliability and security of the Victorian transmission network.[94]

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91 AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, pp. 5, 7-9.

92 ASIC, *Cyber resilience: Health Check report*, March 2015; http://download.asic.gov.au/media/3062900/rep429-published-19-march-2015-1.pdf.

93 AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, pp. 5, 7-9.

94 AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 5.

Absent any explicit regulatory obligation, we consider any increase in IT security AusNet Services undertakes is a discretionary business decision that can be funded through its base level of opex. We consider a service provider should be able to fund relatively small increases in discretionary opex without forecasting an increase in total opex.

As with many types of expenditure, AusNet Services has flexibility as to what form and scope of IT security it undertakes and how much it spends on this area of opex. While total opex is broadly recurrent over time, some categories of opex will increase, while others will decrease. We would expect an efficient and prudent provider to respond and reallocate its opex in priority areas as its business circumstances change. IT security may be one such area where a service provider wants to devote increased resources. However, at 0.6 per cent of its proposed opex[95], this is a relatively small increase in the cost of one component of AusNet Services' expenditure. AusNet Services has not demonstrated to us why this program could not be funded through other reductions in discretionary expenditure.

The CCP submitted that the establishment of an IT security team is an ongoing operating expenditure of any business and did not consider it should be included as a step change.[96]

C.4.2 New emergency response arrangements

We have not included an increase in opex for new emergency response arrangements in our alternative opex forecast.

AusNet Services forecast an increase in opex of $1.0 million ($2016–17) for new emergency response arrangements.[97] It stated the step change is to comply with the greater emergency management and response capacity required of it as a result of the recently established Emergency Management Victoria (EMV) and the Office of the Inspector General of Emergency Management.[98]

To assess this step change we assessed the new legislative requirements placed on AusNet Services.

Deployment of staff to the State Control Centre

AusNet Services stated it will be required to deploy Emergency Management Liaison Officers (EMLOs) to the State Control Centre (SCC) on a 24/7 year round roster to

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95 Proposed opex excluding easement land tax, 3.3/508.7×100 = 0.65%

96 CCP (subpanel 5), *Submission in response to AusNet Services' 2017–22 transmission determination proposal*, February 2016, p. 28.

97 AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, pp. 8-9.

98 AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 8.

respond to emergencies.[99] The SCC is Victoria's primary control centre for the management of emergencies. AusNet Services forecast that to deploy staff to the SCC will cost $730 000.

We consider AusNet Services' proposal did not:

- provide specific references to the deployment requirements
- explain why changes in these requirements were expected to represent a greater burden to AusNet Services.

AusNet Services' proposal referred to compliance requirements that were not clearly identified. For example, while AusNet Services referred to the Emergency Management Act 2013, the requirement to deploy staff to the SCC is not a legislated requirement under the Emergency Management Act 2013 nor is it legislated in the associated regulations or Ministerial Guidelines.

Moreover, we consider an efficient and prudent service provider would already incur costs to undertake the activities identified by AusNet Services. This includes:

- train staff to respond to emergencies
- pay on-call allowances and overtime to staff rostered to respond to emergencies
- provide staff to cooperate with the relevant state emergency management authority in an emergency.

Therefore, we do not consider AusNet Services has demonstrated that being required to undertake these activities would represent a greater burden than business as usual.

For these reasons, we have not included an increase in opex for this component of the proposed step change in our total opex forecast.

Emergency exercise and audit

We accept that AusNet Services is required to conduct and evaluate an annual exercise to test its preparedness in respect of an emergency.[100] However, we are not satisfied the changed legislation imposes a more onerous requirement on AusNet Services than existed previously.

Effective 1 July 2015, the Emergency Management Act 2013 was amended to include Critical Infrastructure Resilience.[101] Owners and operators of critical infrastructure, such as transmission networks, are required to comply with the regulations which prescribe a minimum set of standards for:

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99 AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 8.

100 Section 74Q and 74S of the Emergency Management Act 2013 http://www.austlii.edu.au/au/legis/vic/bill/emairb2014615/.

101 A new part 7A was added to the Act.

- emergency risk management planning
- the emergency exercise
- audit processes.

AusNet Services has forecast an increase in costs to undertake the annual emergency exercise that has been uplifted from a terrorism event to an 'all hazards' type event ($220 000) and to audit its risk management plan ($60 000).[102]

AusNet Services has been required to prepare and test a risk management plan to address the risk of a terrorist incident since 2003. The Terrorism (Community Protection) Act 2003 requires the operator of a declared essential service to prepare and participate in a training exercise at least once each year to test the operation of its risk management plan.[103]

We acknowledge the amendment to the Emergency Management Act 2013 has broadened the nature of the emergency exercise to include all hazards rather than just terrorism. However, we are not satisfied AusNet Services has demonstrated undertaking an all hazards exercise will place a materially heavier burden on it than undertaking a terrorism exercise. We expect that generally the same agencies[104] and arrangements used to respond to terrorism incidents are also used to respond to all hazard emergencies.[105]

The CCP submitted that, like IT security, emergency response arrangements are an ongoing operating expenditure that should not be included as a step change.[106]

C.4.3 Smart Aerial Image Processing (SAIP) roll out

We have not included an increase in opex to implement new condition monitoring techniques for conductors using smart aerial image processing (SAIP) in our alternative opex forecast.

AusNet Services forecast an increase in opex of $0.9 million ($2016–17) above the costs already in the base year to implement SAIP.[107] SAIP is an enhanced condition assessment technique that uses helicopter-mounted high resolution video cameras to capture a continuous stream of digital images of overhead conductors. This technique is used to detect defects.

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[102] AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 9.

[103] Terrorism (Community Protection) Act 2003,Victoria, Section 33, Duty to participate in training exercises.

[104] For example, emergency, police and fire services.

[105] Victorian Auditor-General's Report on, *The Preparedness to Respond to Terrorism Incidents: Essential services and critical infrastructure*, Executive summary, January 2009, p. 2.

[106] CCP (subpanel 5), *Submission in response to AusNet Services' 2017–22 transmission determination proposal*, February 2016, p. 29.

[107] AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, pp. 5, 9–11.

AusNet Services stated due to its ageing transmission network, its older assets are more likely to fail due to their deteriorating condition.[108] It stated that the deployment of SAIP would allow it to better predict the optimal timing of conductor replacements, and avoid undertaking replacement works before they are necessary. It also stated delaying replacement too long poses a potential safety and liability risk. Consequently, AusNet Services proposed the SAIP roll out step change as a capex/opex trade-off.[109]

The CCP submitted that the SAIP rollout should be included as a step change because it is a new expenditure that will reduce capital costs through more efficiently applying asset replacement capex dollars.[110]

The EUCV also submitted that at a high level, the SAIP project might be beneficial to consumers. However, it stated, there is no evidence there is a return for undertaking this activity.[111]

Having assessed AusNet Services' proposed SAIP roll out, we do not consider it has sufficiently identified or quantified the capex savings that will accrue as a result of the increase in opex it has proposed.

AusNet Services submitted that since 2009, it has completed a number of SAIP trials on different parts of its transmission network. It has applied SAIP to approximately 1500km of its overhead transmission network (out of a total of about 6000km or 25 per cent of their network).[112]

AusNet Services stated that the new condition monitoring techniques for conductors using SAIP has not impacted capex over the 2017–22 regulatory period, but is expected to affect capex requirements in future periods. AusNet Services determined that deferring the replacement of 30km of 500kV conductor (with an estimated project cost of $30m) by two years in five years' time would economically justify the proposed opex. We do not consider this estimate represents a sufficiently rigorous cost benefit analysis of the project.

We accept that SAIP generally is an effective technique for monitoring the condition of a network but note that AusNet Services has not provided any evidence from the assessments conducted to date that there is a particular need to focus on the replacement (or deferral) of conductors that would warrant this step change.

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[108] AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 9.

[109] AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 11.

[110] CCP (subpanel 5), *Submission in response to AusNet Services' 2017–22 transmission determination proposal*, February 2016, p. 28.

[111] EUCV, *Submission in response to AusNet Services 2017–22 transmission determination proposal*, February 2016, p. 33.

[112] AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 11

Given the lack of robust evidence to support the benefits of any capex savings, we consider a step change in opex is not required in order for our forecast of total opex to meet the opex criteria.

C.4.4 Step changes for non-recurrent expenditure

In addition to the step changes above, AusNet Services proposed three additional step changes for non-recurrent expenditure to:

- lease a mobile switchboard at WMTS
- decommission three Synchronous condensers
- decommission assets at Morwell Power Station.

We have not included an increase in opex for any of these non-recurrent costs in our alternative opex forecast. We consider the opex for these projects is already provided in our base opex forecast.

WMTS mobile switchboard

AusNet Services forecast an increase in opex of $2 million ($2016–17) to lease a WMTS mobile switchboard.[113]

This step change is related to AusNet Services' proposal to rebuild the WMTS in the 2017–22 regulatory control period. As part of the rebuild, AusNet Services is planning to retire the 22kv switchroom at the site, however, it is concerned the 22kv switchboard may fail before it is taken out of service. To address this risk, it proposed leasing a mobile switchboard to maintain the switchroom assets until they are taken out of service.[114]

Decommissioning of three synchronous condensers

AusNet Services proposed a step change of $4.3 million ($2016–17) to decommission three synchronous condensers it is retiring.[115]

Synchronous condensers provide benefits by regulating the voltage of the network. There are three synchronous condensers on AusNet Services' transmission network. These were installed in the 1960's and 1970's and are located at Fishermans Bend, Templestowe and Brooklyn Terminal Stations. These assets have reached the end of their economic lives and AusNet Services proposed to decommission these

[113] AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, pp. 12-14.

[114] AusNet Services, *Revenue proposal 2017–22, October 2015, p. 76.*

[115] AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, pp. 14-15.

synchronous condensers in 2017–18.[116] It stated as it does not routinely decommission assets, these costs are not represented in the base year.[117]

AEMO confirmed the synchronous condensers are no longer justified by market benefits and will not need to be replaced.[118]

Decommissioning of assets at Morwell Power Station

AusNet Services forecast a step change of $1.9 million ($2016–17) to decommission and remove assets at Morwell Power Station (MPS) which has closed.[119]

The Energy Brix Power Station was a brown coal–fired thermal power station located at Morwell. The power station was used to supply electricity for the retail market, as well as the production of briquettes in the adjacent Energy Brix briquette works. It was shut down in August 2014.

Energy Brix Australia Corporations (EBAC) advised AusNet Services that it will demolish the MPS at the end of 2017. AusNet Services' electricity distribution and transmission assets located at MPS will no longer be required.

AusNet Services stated that to ensure the redundant assets do not pose a safety threat, it is required to decommission and make these assets safe. This involves identifying all live equipment in the yard and electrically isolating and disconnecting the equipment from the network in such a way that it cannot be made live by normal switching means, as well as draining and disposing of oil from transformers.[120]

AusNet Services stated there is no agreement in place for its decommissioned assets to be located on EBAC's land.[121] Therefore, it is proposing a step change for the costs of decommissioning its transmission assets, removing these assets from EBAC's land and restoring the site. It considered this approach is the most prudent option of mitigating the risk of the 'do nothing' option, which includes exposing AusNet Services to liability if its assets are not made safe and removed from EBAC's land.

Assessment

We agree with AusNet Services that the proposed opex solutions are prudent and efficient. However, we consider the opex is already provided for in our base opex forecast.

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116 AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 14.

117 AusNet Services, *Revenue proposal 2017–22, October 2015, p. 142.*

118 AEMO*, Letter to AusNet Services*, 1 April 2016, published as a submission on our web site.

119 AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 15.

120 AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 15.

121 AusNet Services, *Revenue proposal 2017–22, Appendix 5D: Proposed operating and maintenance expenditure step changes*, October 2015, p. 15.

AusNet Services identified a number of specific drivers for its proposed opex step changes. We consider asset management, whether it is to prolong the life of an asset (refurbishment) or to end the life of an asset is business as usual for a network service provider. Generally, an efficient base level of opex (rolled forward each year with an appropriate rate of change) is sufficient for a prudent and efficient service provider to manage its assets and in doing so maintain the quality, safety, reliability and security of supply of its network.

We make our assessment about the total forecast opex amount and not about particular categories or projects in the opex forecast. The opex on projects and programs will always change in the forecast period relative to the base year. However, variations in non-recurrent opex tend to offset each other so that total opex is relatively stable.

We accept that there are activities that were not undertaken in the base year but may be required in other years. However, there are similarly activities that were undertaken in the base year that will not be required in subsequent years. If these are not taken into account it can produce a biased opex forecast inconsistent with the opex criteria. It is for this reason we take a holistic top down approach and do not analyse all opex activities individually.

AusNet Services adopted our base-step-trend forecasting approach in its opex proposal. It stated

> Consistent with the 2014–17 determination where 'asset works' opex was deemed by the AER to be recurrent in nature and subject to a base-step-trend approach, AusNet Services has retained asset works in base year expenditure and forecast it using the base-step-trend approach for the forthcoming period. This approach assumes that individual items of non-recurrent expenditure will rise and fall across the forthcoming regulatory period such that total non-recurrent opex is broadly consistent from year-to-year.[122]

Figure C.1 below illustrates that AusNet Services total opex (excluding land tax and provisions) has been stable since 2010–11.

We would generally expect that to keep opex relatively recurrent a service provider can reallocate resources between different projects and programs and between different categories. For instance, between 2013–14 and 2014–15, network overheads allocated to opex increased by $2.8 million between 2013 and 2014.[123] However AusNet Services' opex only increased by $1.6 million. AusNet Services was able to limit the reduction in network overheads by reducing its maintenance expenditure by $1.9 million.

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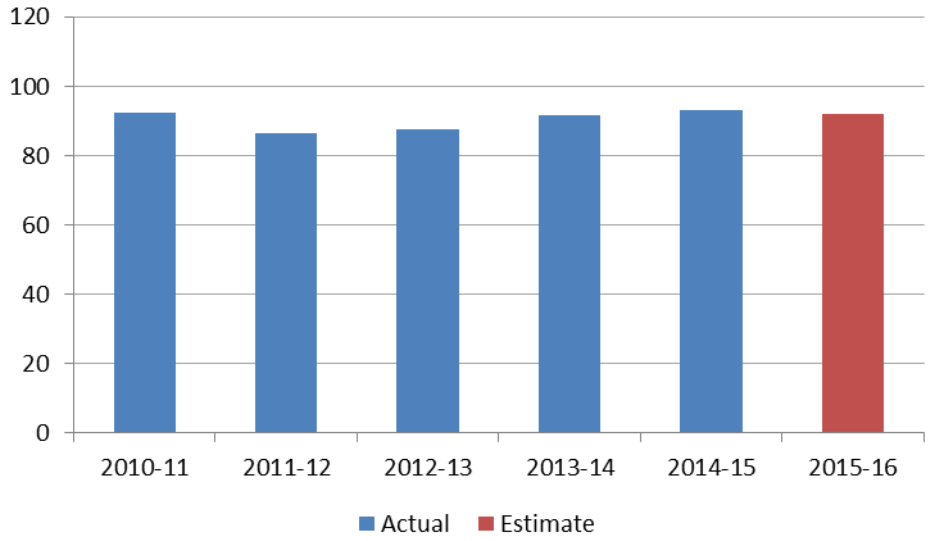
[122] AusNet Services, *Revenue proposal 2017–22, October 2015, p. 111.*

[123] AusNet Services, *Category analysis RIN response 2013–14 and 2014–15*, table 2.1.2.

Figure C.1 AusNet Services' actual opex ($ million, 2016–17)



Source: AusNet Services, Opex Model, October 2015,

Note: Opex minus easement land tax and provisions.

We agree with AusNet Services' assumption that individual items of non-recurrent expenditure will rise and fall such that total opex is broadly consistent from year to year. Based on the information in AusNet Services' proposal, we consider the three proposed step changes are such non-recurrent items. Therefore, we consider a step change for these programs is not required.

The CCP submitted that the WMTS mobile switchboard, the decommissioning of the synchronised condensers and the decommissioning of assets at Morwell power station should not be included as step changes.[124] It stated the costs of a new WMTS mobile switchboard is a replacement of the current switch room and is part of standard operating costs. While it recognised that the shutdown of Morwell power station is a large event, it stated large events are also a part of normal operations for a transmission business.

While we did not agree with all of the CCP's reasons, we agree that these costs are a part of normal operations.

[124] CCP (subpanel 5), *Submission in response to AusNet Services' 2017–22 transmission determination proposal*, February 2016, p. 28.