



FINAL DECISION
ActewAGL distribution
determination
2015–16 to 2018–19

Attachment 7 – Operating
expenditure

April 2015

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Note

This attachment forms part of the AER's final decision on ActewAGL's regulatory proposal 2015–19. It should be read with other parts of the final decision.

The final decision includes the following documents:

Overview

Attachment 1 - Annual revenue requirement

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 - Demand management incentive scheme

Attachment 13 - Classification of services

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Shortened forms

Shortened form	Extended form
AARR	aggregate annual revenue requirement
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ASRR	aggregate service revenue requirement
augex	augmentation expenditure
capex	capital expenditure
CCP	Consumer Challenge Panel
CESS	capital expenditure sharing scheme
CPI	consumer price index
CPI-X	consumer price index minus X
DRP	debt risk premium
DMIA	demand management innovation allowance
DMIS	demand management incentive scheme
distributor	distribution network service provider
DUoS	distribution use of system
EBSS	efficiency benefit sharing scheme
ERP	equity risk premium
Expenditure Assessment Guideline	expenditure forecast assessment Guideline for electricity distribution
F&A	framework and approach
MRP	market risk premium
NEL	national electricity law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
NSP	network service provider
opex	operating expenditure
PPI	partial performance indicators
PTRM	post-tax revenue model
RAB	regulatory asset base

Shortened form	Extended form
RBA	Reserve Bank of Australia
repex	replacement expenditure
RFM	roll forward model
RIN	regulatory information notice
RPP	revenue pricing principles
SAIDI	system average interruption duration index
SAIFI	system average interruption frequency index
SLCAPM	Sharpe-Lintner capital asset pricing model
STPIS	service target performance incentive scheme
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 standard control 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 are in the following appendices:

- Appendix A - Base opex
- Appendix B - Rate of change
- Appendix C - Step changes
- Appendix D - Forecasting methodology.

7.1 Final decision

We are not satisfied that ActewAGL's forecast opex reasonably reflects the opex criteria.¹ We therefore do not accept the forecast opex ActewAGL included in its building block proposal.² We compare our alternative estimate of ActewAGL's opex for the 2014–19 period, with ActewAGL's initial proposal, our draft decision and its revised proposal in Table 7.1.³

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

	2014–15	2015–16	2016–17	2017–18	2018–19	Total
ActewAGL's initial proposal	76.7	74.9	73.0	75.6	77.1	377.3
AER draft decision	42.5	43.2	44.1	44.8	45.6	220.3
ActewAGL's revised proposal	74.8	74.2	72.3	74.3	75.6	371.2
AER final decision	46.1	47.3	48.0	48.9	50.3	240.6

Source: AER analysis.

Note: Excludes debt raising costs.

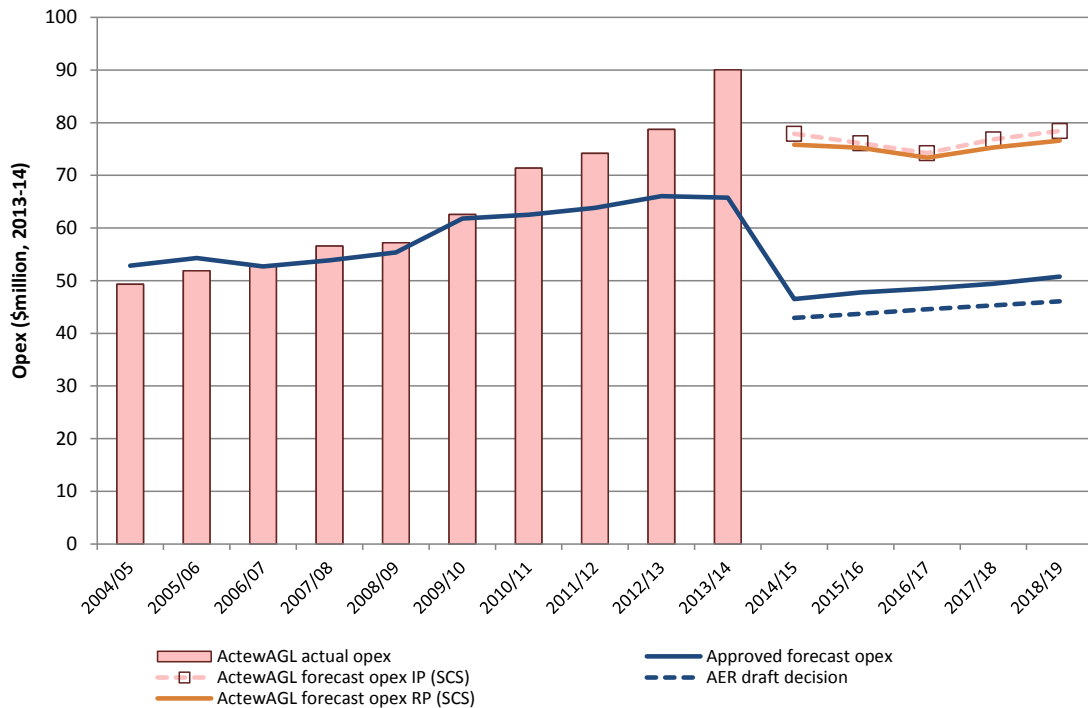
Figure 7.1 shows our final and draft decisions compared to ActewAGL's past actual opex, previous regulatory decisions and its initial and revised proposals.

¹ NER, clause 6.5.6(c).

² NER, clause 6.5.6(d).

³ NER, clause 6.12.1(4)(ii).

Figure 7.1 AER final decision compared to draft decision and ActewAGL's past and proposed opex (\$ million, 2013–14)



Source: ActewAGL, Regulatory accounts 2004–05; ActewAGL, Economic benchmarking - Regulatory Information Notice response 2005–06 to 2013–14; ActewAGL, *Regulatory proposal for the 2014–19 period* - Regulatory Information Notice; ActewAGL, *PTRM for revised regulatory proposal for the 2014–19 period*.

The primary reason for the difference between our forecast and ActewAGL's proposal reflects our views about ActewAGL's recent historical performance and whether it should be used as the basis for forecasting ActewAGL's opex in the 2014–19 period. This affects how we develop the starting point for our alternative forecast of opex over the 2014–19 period.

ActewAGL's proposal is based on the opex it incurred in 2012–13 (base year) in delivering standard control services. We assessed whether this is a reasonable starting point for forecasting ActewAGL's opex over the 2014–19 period.

We examined ActewAGL's proposal using a number of different techniques including:

- detailed reviews of ActewAGL's labour and workforce practices and vegetation management, and
- top down benchmarking at both a total opex and category level.

This information provided convincing evidence that ActewAGL's opex in its proposed base year was materially inefficient. The evidence we received in response to our draft decision or in relation to ActewAGL's revised proposal did not cause us to depart from this conclusion. We have arrived at our alternative opex estimate by taking into account a wide range of cost drivers faced by ActewAGL. This includes (but is not limited to):

- the size of ActewAGL's network
- the number of customers ActewAGL delivers to
- the regulatory obligations ActewAGL faces
- the characteristics of ActewAGL's network such as asset age, percentage of assets underground, and percentage of assets for subtransmission
- the expected growth in labour prices over the 2014–19 period
- ActewAGL's capitalisation practices
- safety and reliability outcomes.

To the extent that the operating environment faced by ActewAGL is not accounted for in our benchmarking model, where appropriate, we have adjusted our benchmark for the estimated cost of these operating environment factors.

Benchmarking is a well-developed tool that has already been used extensively by overseas regulators. There are a number of different ways in which service providers can be benchmarked. We received a number of submissions from ActewAGL, other distributors as well as other stakeholders who provided us with various expert reports critiquing our approach. We have considered this material in detail. Our view is that the benchmarking we have relied upon in this final decision is more robust than the alternatives proposed by ActewAGL, other service providers and their consultants in terms of model specification, data and estimation methods. However, in response submissions we have modified our approach in this final decision. This modification has led to an increase in the total forecast we are satisfied reasonably reflects the opex criteria.

In total we have increased our opex forecast by \$20.3 million (\$ 2013–14) since our draft decision.

The difference between our draft decision and final decision amounts largely reflects two main areas of change:

- We have used a lower point of comparison in assessing ActewAGL's relative efficiency to other service providers in the NEM in its benchmarking performance.
- We have reached different conclusions about step changes for new and changed regulatory obligations facing ActewAGL in the 2014–19 period.⁴

We note that ActewAGL considered in response to our draft decision that the draft decision, if implemented, would adversely impact the ability of it to provide safe, reliable and secure supply at an efficient price.⁵ We do not agree. We consider the amount we have allowed ActewAGL to recover from consumers will enable it continue

⁴ This affects step changes to base opex.

to provide safe and reliable network service but will reflect the efficient costs of a prudent operator, given a realistic expectation of the demand forecast and cost inputs.

7.2 ActewAGL's revised proposal

In its regulatory proposal, ActewAGL proposed total forecast standard control service opex of \$377.3 million (\$ 2013–14) for the 2014–19 period (excluding debt raising costs). This total opex forecast was comprised of:

- Base opex for the 2014–19 period of \$224.7 million based on adjusted actual opex incurred in 2012–13 excluding maintenance and vegetation management
- Zero-based category specific forecasts⁶ for network maintenance and vegetation management expenditure of \$110.7 million
- Step changes, which resulted in an increase to base opex for the 2014–19 period of \$35.3 million; and
- Forecast changes in input prices, which resulted in an increase to base opex for the 2014–19 period of \$6.7 million, (not including maintenance and vegetation management, for which real price growth was incorporated into the zero-based forecast).⁷

ActewAGL, in its revised proposal, maintained its position that the use of a revealed cost approach, in conjunction with an appropriate rate of change and step changes, is a superior approach to benchmarking to determine its forecast opex. In total it has forecast standard control services opex of \$371.2 million (\$ 2013–14) for the 2014–19 period (excluding debt raising costs). This is a reduction from the \$377.3 million (\$ 2013–14) it proposed in its original proposal. The reduction in opex was mainly attributable to correction of an error ActewAGL had made in its original proposal.⁸

ActewAGL did not agree with our approach to forecasting total opex. It considered we had applied primacy on economic benchmarking over other considerations. It also considered the benchmarking we had undertaken to be flawed and cannot be relied on to set opex allowances.⁹ It considered adjustments we had made for cost drivers not taken into account through benchmarking to be ad-hoc.¹⁰

While ActewAGL disagreed with our forecast, it submitted that if we apply a similar forecast in our final decision, we should apply a transition path.¹¹

⁶ Also known as bottom up forecasts.

⁷ ActewAGL, *Revised regulatory proposal*, January 2015, p. 85.

⁸ ActewAGL Distribution, *Revised regulatory proposal*, p. 247.

⁹ ActewAGL Distribution, *Revised regulatory proposal*, p. 84.

¹⁰ ActewAGL Distribution, *Revised regulatory proposal*, p. 85.

¹¹ ActewAGL Distribution, *Revised regulatory proposal*, p. 88.

7.3 Assessment approach

Our assessment approach, outlined below, is, for the most part,¹² consistent with the Expenditure forecast assessment guideline (the Guideline). We decide whether or not to accept the service provider's total forecast opex. We accept the service provider's forecast if we are satisfied that it reasonably reflects the opex criteria.¹³ If we are not satisfied, we replace it with a total forecast of opex that we are satisfied does reasonably reflect the opex criteria.¹⁴

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:¹⁵

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

The service provider's forecast is intended to cover the expenditure that will be needed to achieve the operating expenditure objectives. These objectives are:¹⁶

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

We assess the proposed total forecast opex against the opex criteria set out in the NER. The opex criteria provide that the total forecast must reasonably reflect:¹⁷

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.

¹² We did not apply the DEA benchmarking technique. We outline the reasons why we did not apply this technique in section A.4 of our base opex appendix. We also have not applied the equation for estimating final year opex. We outline why we have not made this assumption in Appendix B.

¹³ NER, clause 6.5.6(c).

¹⁴ NER, clause 6.5.6(d).

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

¹⁶ NER, clause 6.5.6(a).

¹⁷ NER, clause 6.5.6(c).

The AEMC noted that '[t]hese criteria broadly reflect the NEO [National Electricity Objective]'.¹⁸

In deciding whether or not we are satisfied the service provider's forecast reasonably reflects the opex criteria we have regard to the opex factors.¹⁹ We attach different weight to different factors when making our decision to best achieve the NEO. This approach has been summarised by the AEMC as follows:²⁰

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

The opex factors we have regard to are:

- the most recent annual benchmarking report that has been published under clause 6.27 and the benchmark operating expenditure that would be incurred by an efficient distribution network service provider over the relevant regulatory control period
- the actual and expected operating expenditure of the distribution 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 distribution 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 distribution network service provider under clauses 6.5.8 or 6.6.2 to 6.6.4
- the extent the operating expenditure forecast is referable to arrangements with a person other than the distribution network service provider that, in our opinion, 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 6.6A.1(b)

¹⁸ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 113.

¹⁹ NER, clause 6.5.6(e).

²⁰ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 115.

- the extent to which the distribution network service provider has considered and made provision for efficient and prudent non-network alternatives
- any relevant final project assessment conclusions report published under 5.17.4(o),(p) or (s)
- any other factor we consider relevant and which we have notified the distribution network service provider in writing, prior to the submission of its revised regulatory proposal under clause 6.10.3, is an operating expenditure factor.

For this determination, there are two 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) any relevant data from international sources
 - (c) data sets that support econometric modelling and other assessment techniques consistent with the approach set out in the Guideline as updated from time to time.
- economic benchmarking techniques for assessing benchmark efficient expenditure including stochastic frontier analysis and regressions utilising functional forms such as Cobb Douglas and Translog.²¹

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

More broadly, we also note in exercising our discretion, we take into account the revenue and pricing principles which are set out in the National Electricity Law.²²

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

Expenditure forecast assessment guideline

After conducting an extensive consultation process with service providers, users, consumers and other interested stakeholders we issued the Guideline in November 2013 together with an explanatory statement.²³ The Guideline sets out our intended approach to assessing operating expenditure in accordance with the NER.²⁴

²¹ This is consistent with the approach we outlined in the explanatory statement to our Expenditure Forecast Assessment Guideline. See, for example, p. 131.

²² NEL, s. 16(2); s. 7A.

²³ AER, *Expenditure forecasting assessment guideline - explanatory statement*, November 2013.

²⁴ NER, clause 6.5.6.

We may depart from the approach set out in the Guideline but if we do so we give reasons for doing so. In this determination for the most part we have not departed from the approach set out in the Guideline.²⁵ In our Framework and Approach paper for each service provider, we set out our intention to apply the Guideline approach in making this determination.

Our approach is to compare the service provider's total forecast opex with an alternative estimate that we develop.²⁶ By doing this we form a view on whether we are satisfied that the service provider's proposed total forecast opex reasonably reflects the opex criteria. If we conclude the proposal does not reasonably reflect the opex criteria, we use our estimate as a substitute forecast. This approach was expressly endorsed by the AEMC in its decision on the major rule changes that were introduced in November 2012. The AEMC stated:²⁷

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

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

If a service provider's total forecast opex is materially different to our estimate and we find no satisfactory explanation for this difference, we may form the view that the service provider's forecast does not reasonably reflect the opex criteria. Conversely, if our estimate demonstrates that the service provider's forecast reasonably reflects the opex criteria, we will accept the forecast.²⁸ Whether or not we accept a service provider's forecast, we must provide the reasons for our decision.²⁹

Building an alternative estimate of total forecast opex

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

²⁵ We did not apply the DEA benchmarking technique. We outline the reasons why we did not apply this technique in section A.4 of our base opex appendix. We also have not applied the equation for final year opex. We outline why we have not made this assumption in Appendix B.

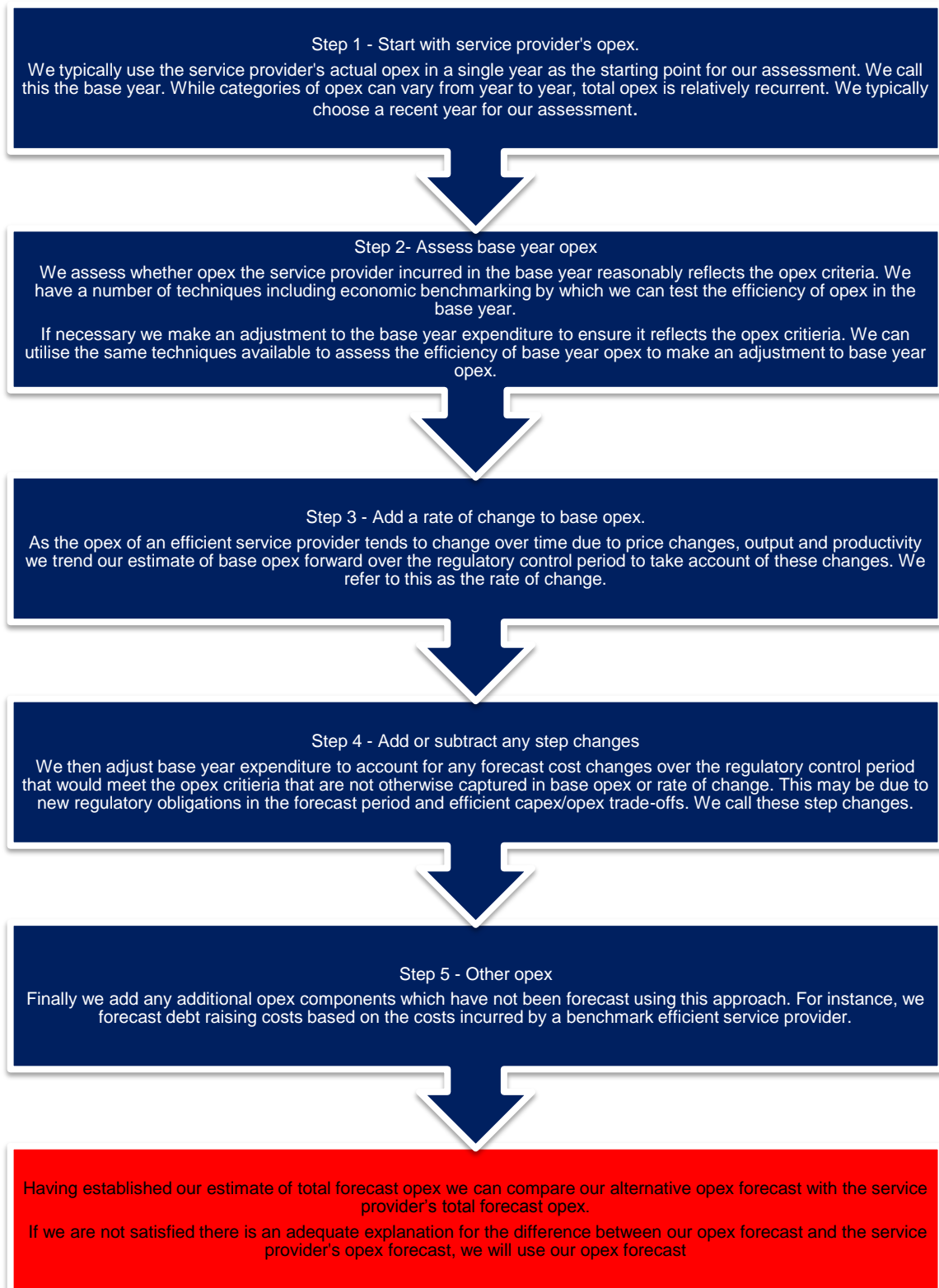
²⁶ AER, *Expenditure forecast assessment guideline*, November 2013, p. 7.

²⁷ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 112.

²⁸ NER, clause 6.5.6(c).

²⁹ NER, clause 6.12.1(3)(ii).

Figure 7.2 Our assessment approach



Underlying our approach are two general assumptions:

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

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

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

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

Step 1 – Starting point - base year expenditure

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

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

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

- If a material cost was incurred in the base year that is unrepresentative of a service provider's future opex we remove it from the base year in undertaking our assessment.
- Rather than use all opex in the base year, service providers also often forecast specific categories of opex using different methods. We must also assess these methods in deciding what the starting point should be. If we agree that these

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

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

Step 2 - Assessing base year expenditure

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

As we set out in the Guideline, to assess the efficiency of a service provider's actual expenditure, we use a number of different techniques.³⁰

For instance, we may undertake a detailed review of a service provider's actual opex. For this final decision, we have engaged EMCa to review ActewAGL's labour and workforce and vegetation management practices.

Benchmarking is particularly important in comparing the relative efficiency of different service providers. The AEMC highlighted the importance of benchmarking in its changes to the NER in November 2012:³¹

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

By benchmarking a service provider's expenditure we can compare its productivity over time, and to other service providers. For this decision we have used Multilateral Total Factor Productivity, Multilateral Partial Factor Productivity and several opex cost function models to assess ActewAGL's efficiency.³²

³⁰ AER, *Expenditure forecast assessment guideline*, November 2013, p. 22.

³¹ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 97.

³² The benchmarking models are discussed in detail in appendix A, which details our assessment of base opex.

We also have regard to trends in total opex and category specific data to construct category benchmarks. We have also used this information to inform our assessment of the efficiency of base year expenditure. In particular, we can use this category analysis data to identify sources of spending that are unlikely to reflect the opex criteria over the forecast period. It may also lend support to, or identify potential inconsistencies with, our broader benchmark modelling.

If we determine that a service provider's base year expenditure does not reasonably reflect the opex criteria, we will not use it as our starting point for our estimate of total forecast opex. Rather, we will adjust it so it reflects an efficient, recurrent level of opex that does reflect the opex criteria. To arrive at an adjustment, we use the same techniques we used to assess the service provider's efficiency.

Step 3 - Rate of change

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

- price growth
- outputs growth
- productivity growth.

We estimate the change by adding expected changes 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 changes 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 year opex and the rate of change in opex of an efficient service provider do not already include the proposed cost.³³

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

In our final step, we make any further adjustments we need for our opex forecast to achieve the opex objectives. For instance, our approach is to forecast debt raising costs based on a benchmarking approach rather than a service provider's actual costs.

³³ AER, *Expenditure forecast assessment guideline*, November 2013, p. 24.

This is to be consistent with the forecast of the cost of debt in the rate of return building block.

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

Comparing the service provider's proposal with our estimate

Having established our estimate of total forecast opex we can test the service provider's proposed total forecast opex. This includes comparing our alternative total with the service provider's total forecast opex. However, we also assess whether the service provider's forecasting method, assumptions, inputs and models are reasonable, and assess the service provider's explanation of how that method results in a prudent and efficient forecast.

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

This approach is supported by the AEMC's decision when implementing the changes to the NER in November 2012. The Commission stated:³⁴

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

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

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

Accordingly, if our opex forecast is lower than a service provider's current opex we would generally not consider it open to us to provide a transition path to the efficient allowance. This approach is reflected in the NER, which provides that we must be

³⁴ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 112.

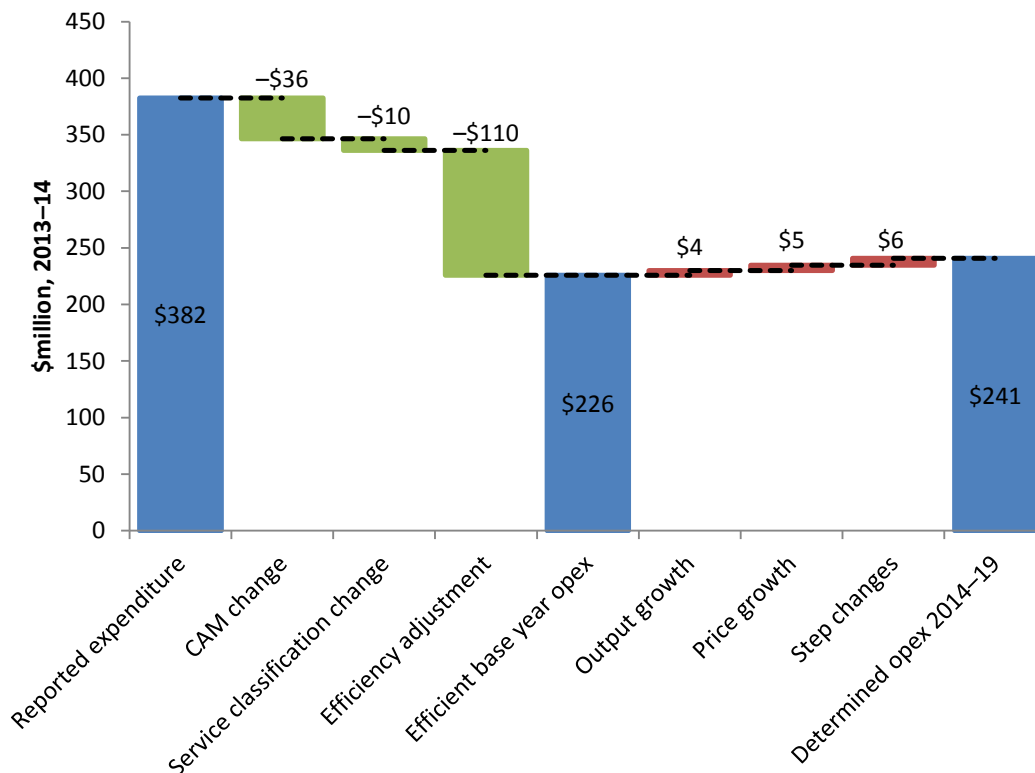
satisfied that the opex forecast reasonably reflects the efficient costs of a prudent operator given reasonable expectations of the demand forecast and cost inputs to achieve the expenditure objectives.³⁵

7.4 Summary of our decision

We are not satisfied ActewAGL's total forecast opex reasonably reflects the opex criteria. We compared ActewAGL's opex forecast to an opex forecast we constructed using the method outlined above. ActewAGL's proposal is higher than ours and we are satisfied that it does not reasonably reflect the opex criteria. For this reason, we have substituted ActewAGL's total opex forecast with our total opex forecast.

Figure 7.3 illustrates how our forecast for the 2014–19 period has been constructed. The starting point on the left is what ActewAGL's opex would have been for the 2014–19 period if it was set based on ActewAGL's reported opex in 2012–13. We have set an opex forecast lower than this amount due to our assessment of ActewAGL's opex against the opex criteria (efficiency adjustment) and to reflect changes in ActewAGL's cost allocation method and service classification. We have then added our forecast of output growth, price growth and step changes to arrive at our total opex forecast for the 2014–19 period.

Figure 7.3 Our final decision opex forecast for the 2014–19 period



Source: AER analysis.

³⁵ AER, *Expenditure forecast assessment guideline - Explanatory statement*, November 2013, p. 23.

Table 7.2 illustrates our forecast in each year of the 2014–19 period.

Table 7.2 Our final decision opex forecast (\$ million, 2013–14)

	2014–15	2015–16	2016–17	2017–18	2018–19	Total
Base opex	45.1	45.1	45.1	45.1	45.1	225.7
Rate of change—output growth	0.3	0.5	0.8	1.1	1.5	4.2
Rate of change—price growth	0.0	0.4	0.9	1.4	2.0	4.7
Step change - Environment, Health, Safety and Quality	0.4	0.4	0.2	0.3	0.2	1.4
Step change - Regulatory obligations	0.4	0.9	0.9	0.9	1.5	4.5
Total opex forecast	46.1	47.3	48.0	48.9	50.3	240.6

Source: AER analysis; Note numbers may not add due to rounding.

A summary of the main steps of our assessment are outlined below.³⁶

7.4.1 Forecasting method assessment

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

We provided reasons in our draft decision why adopting ActewAGL's forecasting method would not produce an opex forecast that better reflects the opex criteria.³⁷ Despite raising some concerns with our assessment of its forecasting method in our draft decision, ActewAGL stated that it adopted our preferred forecasting method for its revised regulatory proposal. Accordingly, it used a 'base year (base-step-trend) approach' to forecast all opex categories.

We discuss the concerns raised by ActewAGL, and the changes it made to its forecasting method in appendix D.

³⁶ For each of these areas, our analysis is supported by an appendix. In addition appendix D assesses ActewAGL's forecasting methodology.

³⁷ AER, *Draft decision: ActewAGL distribution determination 2014–19*, Attachment 7, November 2014, pp. 234–236.

7.4.2 Base opex

Assessing ActewAGL's base opex

We assessed ActewAGL's proposed base year of 2012–13. We tested ActewAGL's base opex in 2012–13 using overall benchmarking techniques. We then examined the drivers of the results of these benchmarking techniques by examining key components of opex. For ActewAGL, we looked specifically at ActewAGL's labour and workforce practices and its vegetation management.

The main techniques we used to test the efficiency of ActewAGL's base opex are outlined in Table 7.3. Our findings from our examination of ActewAGL's labour and workforce practices support our overall benchmarking findings, which conclude that ActewAGL's actual base opex is materially inefficient. This is the same conclusion we reached in our draft decision.

The evidence put forward by ActewAGL in its revised proposal did not cause us to alter most of the findings in our draft decision. Therefore, without an efficiency adjustment, we consider a forecast base opex based on ActewAGL's actual historical opex would not reasonably reflect the opex criteria.

Table 7.3 Assessment of ActewAGL's base opex

Technique	Description of technique	Findings
Economic benchmarking	<p>Economic benchmarking measures the efficiency of a service provider in the use of its inputs to produce outputs.</p> <p>The economic benchmarking techniques we used to test ActewAGL's efficiency included Multilateral Total Factor Productivity, Multilateral Partial Factor Productivity and opex cost function modelling. We compared ActewAGL's efficiency to other service providers in the NEM.</p>	<p>Despite differences in the techniques we used, all benchmarking techniques show ActewAGL does not perform as efficiently as most other service providers in the NEM.</p> <p>We consider that differences in ActewAGL's operating environment not captured in the benchmarking models do not adequately explain the different benchmarking results between ActewAGL and other service providers.</p>
Review of labour and workforce practices	<p>Labour costs represent a large proportion of ActewAGL's opex (approximately 80 per cent). Category analysis showed ActewAGL had high labour costs relative to most of its peers and ActewAGL's regulatory proposal suggested labour costs were a reason ActewAGL overspent its opex allowance in 2012–13. Therefore, we decided, with the assistance of EMCa, to conduct a detailed review of ActewAGL's labour and workforce practices.</p>	<p>EMCa considered that there is evidence that ActewAGL's work practices, processes and systems in 2012–13 were ineffective. EMCa considered that this lead to inefficient use of labour in the office and field. This inefficiency is characterised by duplication of effort in work planning and scheduling, loss of field productivity through ineffective works management and through ineffective data and information management</p> <p>EMCa also considered that ActewAGL's labour levels were not reasonably efficient in 2012–13, noting that ActewAGL has steadily increased its ASL based on assumed future growth scenarios and adopting an internal resourcing strategy. EMCa considered that if ActewAGL had outsourced more of its work, it would likely have benefited from increased labour flexibility and reduced operating costs.</p>

Technique	Description of technique	Findings
		EMCa found a lack of compelling evidence to demonstrate that ActewAGL's labour costs in 2012–13 were reflective of an efficient service provider. EMCa consider this was evident by the relatively high level of internal resources used and the extent to which work was outsourced on an hourly rate bases for the urgent clearance of vegetation.
Review of vegetation management	ActewAGL's vegetation management costs have increased significantly over the 2009–14 period. Category analysis showed ActewAGL has very high costs compared to most of its peers and ActewAGL's regulatory proposal suggested vegetation management was a reason ActewAGL overspent its opex allowance in 2012–13. Therefore, we decided, with the assistance of EMCa, to review ActewAGL's vegetation management practices in detail.	EMCa found that ActewAGL did not act prudently and efficiently to manage costs associated with increased vegetation growth that occurred prior to 2012–13 because its vegetation management practices and its strategic and tactical responses were inadequate. EMCa also found evidence of inefficient vegetation management costs in 2012–13 due to the manual processes between the office and field and the extent of clearance work that was deemed to be urgent, and which was therefore undertaken with a resultant higher cost. It is EMCa's view that a service provider acting to efficiently minimise costs would have incurred a lower level of urgent clearance work.

Source: AER analysis. EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012–13*, April 2015.

Arriving at an alternative estimate of base opex

We are unable to use ActewAGL's historical opex to prepare our alternative forecast of opex because basing our forecast on ActewAGL's historical opex would not result in a forecast opex that would reasonably reflect the opex criteria.

We therefore need to determine a starting point that would lead to a forecast opex that would reasonably reflect the opex criteria.

We have used the results from our preferred benchmarking model (Cobb Douglas SFA) to adjust to ActewAGL's base opex to determine a starting point for our forecast of overall opex that would reasonably reflect the criteria.³⁸ Our preferred benchmarking model measures the opex efficiency of all service providers in the NEM over the 2006 to 2013 period relative to a frontier service provider. The outputs in the model are customer numbers, line length and ratcheted maximum demand.

In doing this, we have not adjusted ActewAGL's base opex relative to the efficiency of the frontier service provider. This is consistent with the preference in the Guideline to rely on revealed costs and only adjust base opex where it is materially inefficient.

³⁸ Stochastic frontier analysis (SFA) can directly estimate efficiency scores and has superior statistical properties. Economic Insights, Economic Benchmarking Assessment of Operating Expenditure for NSW and ACT Electricity DNSPs, November 2014, p. v.

Instead, we have used a benchmark comparison point that is the lowest of the efficiency scores in the top quartile of possible scores. This is equivalent to the efficiency score for the business at the bottom of the upper third (top 33 per cent) of companies in the benchmark sample (represented by AusNet Services). We have done this because:

- this recognises that more than a third of the service providers in the NEM, operating in varied environments, are able to perform at or above our benchmark comparison point. We are confident that a firm that performs below this level is therefore spending in a manner that does not reasonably reflect the opex criteria. An adjustment back to this appropriately conservative point is sufficient to remove material inefficiency while still incorporating an appropriately wide margin for potential modelling and data errors for the purposes of forecasting
- given it is our first application of benchmarking, it is appropriate to adopt a cautious approach
- we consider this approach achieves the NEO and RPP because it is sufficiently conservative to avoid the risks associated with undercompensating the service provider but also promotes efficiency incentives.

Our estimate of base opex is \$45.1 million (\$ 2013–14). Table 7.4 illustrates the steps we have undertaken to derive our estimate. Table 7.4 shows that we start with average opex in the 2006 to 2013 period. This is because our preferred benchmarking model compares average efficiency over the sample period.

A key reason we use average period efficiency scores is because it reduces the impact of year-specific fluctuations not under the control of the service provider (such as weather conditions). Average efficiency results also provide us with an estimate of underlying recurrent expenditure not influenced by year on year changes, which we require for the Guideline approach to estimating total forecast opex.³⁹

Our detailed assessment of base opex is outlined in appendix A to this attachment.

Table 7.4 Arriving at our alternative estimate of base opex

	Description	Output	Calculation
Step 1 – Start with ActewAGL's average opex over the 2006 to 2013 period	ActewAGL's network services opex was, on average, \$59.9 million (\$2013) over the 2006 to 2013 period.	\$59.9 million (\$2013)	
Step 2 —Calculate the raw efficiency scores using our preferred economic	Our preferred economic benchmarking model is Economic Insights' Cobb Douglas SFA model. We use it to determine all service providers' raw	39.9 per cent ⁴⁰	

³⁹ Economic Insights, Response to Consultants' Reports on Economic Benchmarking of Electricity DNSPs, April 2015, section 4.1.

⁴⁰ Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and ACT Electricity DNSPs*, November 2014, p. 37.

	Description	Output	Calculation
benchmarking model	<p>efficiency scores.</p> <p>Based on ActewAGL's customer numbers, line length, and ratcheted maximum demand over the 2006 to 2013 period, ActewAGL's raw efficiency score is 39.9 per cent.</p>		
Step 3—Choose the comparison point	<p>For the purposes of determining our alternative estimate of base opex, we did not base our estimate on the efficient opex estimated by the model.</p> <p>The comparison point we used was the lowest performing service provider in the top quartile of possible scores, AusNet Services. According to this model AusNet Services' opex is 76.8 per cent efficient based on its performance over the 2006 to 2013 period. Therefore to determine our substitute base we have assumed a prudent and efficient ActewAGL would be operating at an equivalent level of efficiency to AusNet Services.</p>	76.8 per cent ⁴¹	
Step 3— Adjust ActewAGL's raw efficiency score for operating environment factors	<p>The economic benchmarking model does not capture all operating environment factors likely to affect opex incurred by a prudent and efficient ActewAGL.</p> <p>We have estimated the effect of these factors and made a further adjustment to our estimate where required. We have determined a 23.0 per cent reduction to ActewAGL's comparison score based on our assessment of these factors.</p> <p>Material operating environment factors we considered were not accounted for in the model include ActewAGL's responsibility for backyard reticulation, its different capitalisation practices, and its approach of allocating connections expenditure to standard control services opex.</p>	62.4 per cent	$= 0.768 / (1 + 0.230)$
Step 4—Calculate the percentage reduction in opex	We then calculate the opex reduction by comparing ActewAGL's efficiency score with the adjusted comparison point score.	36.2 per cent	$= 1 - (0.399 / 0.624)$
Step 5—Calculate the midpoint efficient opex	<p>We estimate efficient opex at the midpoint of the 2006 to 2013 period by applying the percentage reduction in opex to ActewAGL's average opex over the period.</p> <p>This represents our estimate of efficient opex at the midpoint of the 2006 to 2013 period.</p>	38.2 million (\$2013)	$= (1 - 0.362) * 59.9$ million
Step 6— Trend midpoint efficient opex forward to 2012–13	Our forecasting approach is to use a 2012–13 base year. We have trended the midpoint efficient opex forward to a 2012–13 base year based on Economic Insights' opex partial factor productivity growth model. It estimates the growth in efficient opex based on growth in customer numbers, line	43.3 million (\$2013)	$= 38.2 \times (1 + 0.1326)$

⁴¹ Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and ACT Electricity DNSPs*, November 2014, p. 37.

	Description	Output	Calculation
	length, ratcheted maximum demand and share of undergrounding. It estimated the growth in efficient opex based on ActewAGL's growth in these inputs in this period to be 13.26 per cent.		
Step 7—Adjust our estimate of 2012–13 base year opex for CPI	The output in step 6 is in real 2013 dollars. We need to convert it to real 2013–14 dollars for the purposes of forming our substitute estimate of base opex. This reflects one and a half years of inflation. This is our estimate of base opex.	45.1 million (\$2013–14)	$= 43.3 \times (1 + 0.042)$

Source: AER analysis.

7.4.3 Rate of change

Our forecast rate of change in opex captures the forecast year on year change in our estimate of base opex. Specifically, it accounts for forecast growth in outputs, prices and productivity (such as economies of scale). Output growth and productivity growth captures the forecast change in the quantity of inputs required. Price growth captures the forecast change in the real prices of those inputs. These three opex drivers should account for the main sources of opex changes over time.

We have maintained our draft decision method for forecasting the rate of change.

We have updated our labour forecasts to reflect the most recent forecasts from Deloitte Access Economics and Independent Economics. ActewAGL submitted that we should apply our estimate of the rate of change to the base year and not the subsequent year. We agree because we are no longer applying the final year formula specified in the Guideline.

ActewAGL maintained its initial proposal approach to forecasting the rate of change.

We consider applying our forecast rate of change will give an estimate of total opex that reasonably reflects the opex criteria.

We are satisfied that our draft decision approach to forecasting price growth is reasonable. We note that our consultant Deloitte Access Economics has under forecast utilities labour in the past. Meanwhile we consider ActewAGL's consultant, Independent Economics, forecasts are consistent with BIS Shrapnel who has over forecasted utilities labour in the past. Based on this we consider an average of these two consultants produces the best forecast of labour price growth and is a reasonable response to the sources of evidence available to us, in light of their past performance.

We also consider our draft decision approach to forecasting output growth based on our economic benchmarking analysis produces a robust estimate. As outlined in our draft decision, we consider our output growth measure captures the key outputs of service providers, as valued by customers. Our use of economic benchmarking techniques is detailed in appendix A.

We have forecast zero productivity growth. Our productivity growth forecast is based on our expectations of productivity for a benchmark service provider over the 2014–19 period. In estimating productivity growth we have had regard to a number of sources of evidence. This includes the results of our economic benchmarking analysis, the drivers of recent productivity trends for the distribution businesses and the productivity forecasts for the gas distribution and electricity transmission sectors.

In percentage terms, our forecast rate of change is higher than ActewAGL's. This mainly reflects our higher forecast of output change. Our forecast of output change takes into account the efficient opex we consider is needed given forecast increases in ActewAGL's customers and its network.

In dollar terms, forecast opex attributed to the rate of change in our opex forecast is similar to ActewAGL's proposed opex forecast because our estimate of the rate of change is applied to a lower estimate of base opex.

Table 7.5 compares our final and draft decision with ActewAGL's proposal.

Table 7.5 Rate of change in opex (per cent)

	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
ActewAGL initial proposal		0.44	0.92	1.09	1.12	1.18
AER draft decision		0.48	1.67	1.96	2.02	1.82
AER final decision	0.15	0.35	1.53	1.76	1.82	1.81

Source: AER analysis.

Our detailed assessment of the rate of change is outlined in appendix B to this attachment.

7.4.4 Step changes

We have included two step changes totalling \$6.0 million (\$ 2013–14) in our alternative opex forecast:

1. Environment, health safety and quality step change of \$1.43 million (real 2013–14) for:
 - bushfire mitigation
 - asbestos costs.
2. Regulatory compliance step change of \$4.54 million (\$ 2013–14) for:
 - increased regulatory reporting requirements
 - compliance with new obligations related to the National Energy Customer Framework (NECF)
 - AEMC network pricing arrangements and the connection of embedded generation.

We have included the above step changes in our total opex forecast because we consider they are not accounted for in our alternative estimate of ActewAGL's base opex or the rate of change. These step changes are for costs ActewAGL expects to incur due to changed regulatory obligations since the base year. We find that other step changes ActewAGL proposed are already accounted for in our estimate of base opex or the rate of change.

In our draft decision we included one step change of \$1.4 million in our total opex forecast. That step change was for regulatory compliance costs. Since the draft decision, we have increased the amount of the regulatory compliance step change and added an additional step change for costs ActewAGL expects to incur to comply with new regulatory obligations related to bushfire mitigation and asbestos.

Our detailed assessment of step changes is outlined in appendix C to this attachment.

7.4.5 Inflation

For our draft decision, we lagged the inflation index we used to convert nominal opex amounts to real 2013–14 dollar terms. The lag used was consistent with the treatment of inflation in the roll forward model. Based on submissions received on our draft decision, we have conducted further analysis and agree there is no need to lag the inflation index for opex forecasting purposes for all our decisions.⁴² Consequently we amended our opex model to apply the inflation index without any lag.

7.4.6 Debt raising costs

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

7.5 The impact of our decision

In response to our draft decision, ActewAGL submitted that our approach will increase the safety, reliability and security risk of its network because it will need to immediately restructure, reduce staff and stop certain expenditure programs. ActewAGL also considers the associated revenue reductions will adversely affect its financial viability and pose a risk to investment.⁴³

ActewAGL also submits that if we were to implement the opex reductions from the draft decision, the NEL and NER require that we provide a realistic forecast of its actual

⁴² TransGrid, *Revised revenue proposal*, January 2015, p. 107.

⁴³ ActewAGL, *Revised Regulatory Proposal*, January 2015, pp. vii-vix, 61-79, 260-266.

costs while incentivising efficiency reductions over time in a realistic manner.⁴⁴ This includes:

- redundancy costs which ActewAGL submits should be funded through the "expenditure allowances"⁴⁵
- a transition to mitigate the consequences of requiring service providers to immediately review, and substantially reduce, expenditure.⁴⁶

This section clarifies our approach in light of these submissions.

7.5.1 Safety and reliability

ActewAGL has submitted that the reductions we are making to revenue based on our assessments of opex and capex will lead to safety and reliability risks. In making this submission, ActewAGL is assuming that it would continue to run its business the way it is currently, but with less funds. Therefore, ActewAGL submits, it would need to scale back activities and reduce staff.⁴⁷ This reflects ActewAGL's view that its proposed total opex forecast reasonably reflects the opex criteria so it cannot provide standard control services for any lower amount.⁴⁸

We recognise that service providers must meet their safety and reliability obligations. However, we must consider how much consumers should pay for a service provider to do so. The NER require that we determine a total forecast opex that includes the *efficient* costs that a *prudent operator* would require to achieve the opex objectives (which include safety and reliability obligations).

As we explain below, benchmarking enables us to determine the efficient costs that a prudent operator would require to achieve the opex objectives because we are comparing ActewAGL to all other service providers in the NEM. As we explain in section A.6, all the NEM service providers are operating safe and reliable networks. Further, they are doing so for less cost than ActewAGL.

To the extent that differences between service providers may exist, we 'normalise' for these differences when we assess operating environment factors. Based on this assessment, we reduce the performance gap between ActewAGL and the benchmark comparison point.

Importantly, service providers have the flexibility (and indeed the responsibility) to reallocate funds and resources during the regulatory period in response to changing circumstances, events and risks. Service providers are not constrained to current plans

⁴⁴ ActewAGL, *Revised Regulatory Proposal*, January 2015, pp. 61-79.

⁴⁵ ActewAGL, *Revised Regulatory Proposal*, January 2015, p. 68.

⁴⁶ ActewAGL, *Revised Regulatory Proposal*, January 2015, pp. 257-267.

⁴⁷ ActewAGL, *Revised Regulatory Proposal*, January 2015, pp. vii-vix, 61-79.

⁴⁸ For example, AECOM's report, prepared for ActewAGL, notes that its concerns apply "if ActewAGL's own estimates are eventually proven more reliable." AECOM, *The Impact of the AER Draft Determination on ActewAGL*, p. i.

and processes or by the assumptions and forecasts in either their proposals or the determinations we make. This may require a departure from a business as usual approach.

We recognise that ActewAGL may continue to incur costs above efficient levels due to, for example, its EBA or other practices it has in place that prevents it from easily reducing costs. However, ActewAGL's shareholder, not consumers, must bear these costs.

We are not satisfied that ActewAGL has provided sufficient evidence to support its claims such that we would change our approach to safety and reliability from the approach set out in our draft decision. We consider that our approach, including our use of benchmarking, appropriately accounts for safety and reliability obligations because:

- service providers at and above our benchmark comparison point are meeting their safety and reliability obligations at lower cost
- our decisions set the revenue service providers can recover from consumers, but do not direct or constrain the quantum or allocation of a service provider's spending
- the enforcement of safety regulations is not determined by the quantum of regulatory revenue.

The effect of using benchmarking on safety and reliability

As we explain above, we use several assessment techniques—including benchmarking—to assess the efficiency of revealed opex and determine whether we need to adjust them before building up our alternative estimate.

In section A.4, we explain that we do not apply any benchmarking techniques 'deterministically' or 'mechanically'. As foreshadowed in the Guideline, improved data and the development of benchmarking has improved our ability, over simply using revealed costs, to determine a total opex forecast that reasonably reflects the opex criteria. In section A.7 we explain how we use benchmarking to set a 'comparison point', to which we compare the service provider's opex efficiency.

In doing this, we are appropriately determining an estimate of total forecast opex that is sufficient for a prudent and efficient service provider (facing the same exogenous circumstances as the service provider we are assessing) to meet its safety and reliability obligations, in light of realistic expectations of demand and cost inputs for such a service provider. This is because benchmarking enables us to compare the service provider we are assessing to the 'comparison' service providers that have efficiently achieved their legislated safety and reliability obligations over the benchmark period.

However, to the extent differences may exist, we consider whether they will have an impact on benchmarking performance as part of our assessment of operating environment factors. As we explain in section A.6, we take into account all factors which we reasonably consider are exogenous and non-duplicative. These factors can result in substantial adjustments, providing additional opex to reflect the particular

exogenous circumstances of each service provider. Several of these factors are directly relevant to safety and reliability, such as an allowance for different OH&S regulations and licence conditions. We have adopted a conservative approach to factors which are individually immaterial but may have a collective impact.

Otherwise, however, our examination in section A.6 of safety metrics for all service providers (including those who form part of our benchmark comparison point⁴⁹) demonstrates that the comparator providers have managed to safely meet the requirements to provide standard control services in the relevant period. The comparator firms also operate reliable networks. Therefore, the service providers under assessment can operate safe and reliable networks but for a lower cost.

Further, reliability is also included in our MTFP and opex MPFP benchmarking, which we use to cross-check our preferred benchmarking technique. Given the consistency in results across our benchmarking techniques, we can consider that the benchmark opex amounts will not undercompensate for reliability.

In addition, in our final decision on total forecast capex, our alternative estimate of capex is greater than what we approved in our draft decision because we have accepted much of ActewAGL's revised capex proposal.

While capex is the subject of a separate forecast, ActewAGL has made broad statements about the combined effect of opex and capex reductions on safety.⁵⁰ In arriving at our substitute estimate of total forecast capex, we specifically took into account ActewAGL's ability to meet safety and reliability requirements and obligations. The higher total forecast capex in this final decision is sufficient to meet these requirements and obligations. We consider this addresses the submissions raised about the implications for safety both in relation to the capex required to address safety and the impact of any overall reduction in capex and opex combined.

The AER does not direct or constrain service provider spending

ActewAGL's submissions also suggested that, in determining total forecast opex, we were setting a constraint or requiring it to make "extreme adjustments... in an unduly short timeframe".⁵¹ ActewAGL criticised us for failing to conduct "bottom up" reviews of expenditure.⁵² ActewAGL also submits that our draft decision would require it to adopt a "care and maintenance model" for its business.⁵³ ActewAGL submits that reductions

⁴⁹ While we have lowered the comparison point to AusNet Services in this decision, the comparison point for the operating environment factors is the customer weight average of the service providers that score equal to or above the benchmark comparison point.

⁵⁰ For example, ActewAGL, Statement of Stephen Patrick Devlin of ActewAGL Distribution, 13 February 2015.

⁵¹ ActewAGL, *Revised Regulatory Proposal*, January 2015, p i.

⁵² ActewAGL, *Revised Regulatory Proposal*, January 2015, pp 71-72.

⁵³ ActewAGL, *Revised Regulatory Proposal*, January 2015, pp. 67-79.

in opex will reduce incentives for it to spend money in the short term to achieve efficiencies.⁵⁴

The assumption inherent in these statements is that we determine, dictate and limit what service providers can spend. This assumption also appears in the consultant reports and other material relied on by ActewAGL. For example:

- The witness statement of ActewAGL's General Manager, Asset Management identifies the safety and reliability impacts of expenditure reductions vis-à-vis ActewAGL's expenditure requirements.⁵⁵
- CEPA refers to "the speed at which the AER has set the companies to reduce the inefficiency gap"⁵⁶
- AECOM appears to assume that we are imposing a "forced reduction" on ActewAGL's actual opex (and repex) spending.⁵⁷

This assumption is incorrect. We do not determine, dictate or limit what service providers can spend. As the AEMC notes, we determine the revenue required by a prudent and efficient service provider in a workably competitive market.⁵⁸ We allow service providers to recover this revenue from consumers. It is for a service provider to take this revenue and direct it as it sees fit, including by changing its behaviour to meet new or changing circumstances.⁵⁹

Accordingly if a service provider, for whatever reason, wishes to spend above what we have determined to be prudent, efficient and realistic costs to achieve the opex objectives (for example because it has entered into a particular contract or it has decided to maintain activities at a level which require resourcing above an efficient cost level), it could do so. Alternatively, if the service provider considered its opex forecast should be spent differently to our alternative estimate or to its own proposal, including to achieve longer term efficiencies, it is entitled to do so.

To the extent that service provider incurs costs above efficient levels, the service provider—not consumers—must bear these costs.

In assessing the proposals put to us by service providers our task is to assess efficient costs that can be recovered by the service provider from its customers. We acknowledge and accept that a service provider may choose to spend in excess of the revenue that we have determined would be required of a prudent and efficient service

⁵⁴ ActewAGL, *Revised Regulatory Proposal, Attachment C1 (HoustonKemp, Opex and EBSS)*.

⁵⁵ ActewAGL, Statement of Stephen Patrick Devlin of ActewAGL Distribution, 13 February 2015.

⁵⁶ ActewAGL, *Revised Regulatory Proposal, Attachment C3 (CEPA)*, p. 55.

⁵⁷ AECOM, 2015, *The Impact of the AER's Draft Decision on ActewAGL's Service and Safety Performance*, p i.

⁵⁸ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p 182.

⁵⁹ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p 182 - 183.

provider (facing ActewAGL's exogenous circumstances). However, as noted by the AEMC in the 2012 Rule Determination:⁶⁰

If a service provider is run inefficiently then its shareholders, and not its customers, should bear the financial consequences of inefficient financing practices.

Jacobs' (in a report commissioned by the NSW service providers) notes:⁶¹

There are many strategies open to the distributor management teams to attempt to prepare the organisations for the reduced opex expenditures... (and) Corporate responses such as workplace reforms, restructures, renegotiation of contracts etc. will take time to implement.

How a service provider will respond in light of funded opex being reduced is a matter of corporate governance and for shareholders. Our role is to determine the revenue allowance that should be funded by consumers, which we base on an assessment of efficient costs.

Safety regulation and enforcement is unaffected by regulatory forecasts

Some service providers have suggested that we should have sought the advice of jurisdictional safety regulators in deciding on the appropriateness of our draft decision opex forecasts. Further, they submit that we would be in breach of our primary duty of care under the *Work Health and Safety Act 2011* (Cth) if, being aware of the safety impacts of the proposed opex forecast in the draft determination, we make the final determination allowing for the same level irrespective of the safety impacts.⁶²

We disagree with these submissions. Just as we do not constrain service providers' decisions about safety, safety regulators do not take account of regulatory forecasts when regulating or taking enforcement action. These activities are, quite properly, carried out independently. For example, in the ACT, WorkSafe's primary function is to protect the health and safety of workers in the Territory through the enforcement of the WHS Act and other regulations. The Commissioner of WorkSafe is specifically appointed to promote an understanding and acceptance of, and compliance with, the WHS Act and other laws relating to work safety.⁶³ We consider that neither WorkSafe nor its Commissioner could properly take into account the quantum of regulatory forecasts in determining whether or not a service provider has carried out its WHS obligations.

⁶⁰ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p 73.

⁶¹ Ausgrid, Attachment 1.01 - Jacobs - Reliability Impact Assessment p 12.

⁶² For example, ActewAGL, Submission on the AER's Draft decision ActewAGL distribution determination 2015-16 to 2018-19, 13 February 2015, pp. 11-12; Ausgrid, Revised Regulatory Proposal, pp. 31-33.

⁶³ Section 2.18, Schedule 2 to Work Health and Safety Act 2011 (ACT).

The legal advice by Norton Rose Fulbright (solicitors for ActewAGL) that we will be in breach of the WHS Act if we are warned about safety impacts and nevertheless reduce regulatory forecasts proceeds on the basis that it was instructed by ActewAGL to identify:⁶⁴

whether the AER has any obligation under the WHS Act which would preclude it from making a determination which would (sic) impeded ActewAGL's ability to operate safely.

We find that Norton Rose Fulbright's advice proceeds on two incorrect assumptions:

- that our forecasts dictate spending; and, accordingly
- that the reduction in opex forecasts will, inevitably, mean that service providers are unable to protect their workers.

As we explain above, we do not dictate how much a service provider can or will actually spend during the regulatory control period. Our assessment of the opex forecast required for a service provider to carry out its statutory obligations is based on our benchmarking work and factors specific to the service provider. We determine an amount that the service provider acting prudently and incurring only efficient costs would require to provide a safe and reliable service and to meet its regulatory obligations, including its responsibilities in relation to the health and safety of its workers. It is the responsibility of the service provider to decide how it will meet these obligations.

To the extent that the regulated forecast is less than that which the service provider proposed, it will need to consider factors such as reprioritising its spending programs or re-appraising the need for the level of activity it is considering. If the service provider incurs costs above the opex forecast we determine, it must seek alternative sources of funding as it will not be able to recover these additional expenditures from its customers.

As set out above, health and safety obligations are not enforced by reference to regulatory revenue. Regardless of regulatory revenue, service providers are obligated to protect their workers and other persons involved in their operations. Accordingly, we are not persuaded by Norton Rose Fulbright's interpretation of the WHS Act.

7.5.2 Realistic outcomes

ActewAGL submits that if it is to implement the opex reductions from the draft decision, the NEL and NER require that we provide a realistic forecast of their actual costs while incentivising efficiency reductions over time in a realistic manner.⁶⁵ This includes, it submits:

⁶⁴ Letter from M Tooma of Norton Rose Fulbright to Mr Peter Holden of ActewAGL, 6 January 2015.

⁶⁵ ActewAGL, *Revised Regulatory Proposal*, January 2015, pp. 119, 265-266.

- redundancy costs, which ActewAGL submits should be funded through the "expenditure allowances"⁶⁶
- a transition to mitigate the consequences of requiring service providers to immediately review, and substantially reduce, expenditure.⁶⁷

ActewAGL points to the third opex criterion—"a realistic expectation of the demand forecast and cost inputs required to achieve the operating expenditure objectives"⁶⁸—as the driver of this apparent requirement.

We disagree with these submissions for two reasons. Firstly, our view is ActewAGL's interpretation of the 'realistic' criterion is incorrect. In our view, this criterion is concerned with ensuring that there is a proper basis for estimating the demand and cost inputs that a prudent and efficient service provider would incur over the forecast period.⁶⁹ The demand forecast and cost inputs are for those of a prudent and efficient service provider operating ActewAGL's network. They are not the cost inputs which result from previous inefficient decision making. Such an approach would undermine the incentive based aims of the regulatory scheme when read as a whole, because a service provider that bound itself by less than efficient decisions would be rewarded with a forecast that includes increased cost inputs.

We consider, therefore, that the opex criteria do not impose a requirement for the AER to be satisfied as to how the service provider in question will actually operate its business with the efficient total forecast opex. Such an interpretation runs counter to the notion of a prudent and efficient service provider—albeit facing the same exogenous circumstances as the service provider in question—implied by the opex criteria. Consumers should not be required to fund the consequences of long-term inefficient contracts. This notion was affirmed by the AEMC's removal of "individual circumstances" from the 'prudent' criterion. We are not persuaded by submissions to the effect that we must consider a service provider's actual cost inputs because the AEMC did not remove "individual circumstances" from the 'realistic' criterion.⁷⁰ The phrase "individual circumstances" does not form part of the criterion.

Secondly, ActewAGL's views are based upon the incorrect assumption that it is the AER's role to dictate how they must run their businesses. As we explained in our draft decision, we do not approve specific projects or dictate the legal obligations a service provider enters into. Our task is to determine an efficient level of *total* opex for a prudent service provider to meet the opex objectives over a five year regulatory control

⁶⁶ ActewAGL, *Revised Regulatory Proposal*, January 2015, p. 68.

⁶⁷ ActewAGL, *Revised Regulatory Proposal*, January 2015, pp. 27-267.

⁶⁸ NER, clause 6.5.6(c)(3).

⁶⁹ To this end, our approach is to apply a 'rate of change' to base opex that incorporates such factors including the demand for electricity, input prices and output growth.

⁷⁰ Ergon Energy, *Submission on the Queensland Electricity Distribution Regulatory Proposals 2015–16 to 2019–20 Issues Paper*, 30 January 2015, pp. 10-14.

period. As the AEMC notes, this underpins the incentive properties of the regulatory regime:⁷¹

The level, rather than the specific contents, of the approved expenditure allowances underpin the incentive properties of the regulatory regime in the NEM. That is, once a level of expenditure is set, it is locked in for a period of time, and it is up to the NSP to carry out its functions as it sees fit, subject to any service standards.

Therefore, as we stated in our draft decision and above, we provide service providers with a forecast that we are satisfied reasonably reflects the opex criteria. It is the responsibility of the service provider to decide how it will spend the revenue it recovers from consumers. If the service provider decides to spend more than it can recover from consumers it must seek alternative sources of funding to do so.

Redundancy costs

It submits that moving from its existing level of opex to an efficient level of opex will result in it incurring a significant organisational change and redundancy program and that this should be included in what it terms "expenditure allowances".⁷²

Consistent with our approach in our draft decision, we do not agree with this submission. We are not denying the ActewAGL the ability to transform its business and pay its staff their entitlements. These expenses are both 'legitimate costs' that ActewAGL would need to incur. However, we do not 'fund' service providers for these (or any specific) activities. We assess a service provider's revealed opex in order to form a view on whether it reasonably reflects the opex a prudent and efficient (objective) service provider would require in the future to comply with its obligations. Service providers have broad discretion about all contractual arrangements and the manner in which they carry out those obligations.

While a contractual arrangement may have been entered into in the previous period, this does not mean the associated costs should form the basis for the opex forecast (and, hence, the overall revenue allowance) in the next period. ActewAGL received its revenue allowance for the previous period and we are not taking any of it away. However, we are determining the appropriate starting point for the forecast period. New information and better assessment techniques reveal that ActewAGL's revealed opex is not the appropriate starting point.

If we estimated a forecast by reference to a provider in all the same circumstances as the service provider in question we would potentially need to make a decision that incorporated matters as specific as the service provider's staffing levels or car leasing arrangements, and other matters that are completely within the discretionary control of

⁷¹ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 93.

⁷² ActewAGL, *Revised Regulatory Proposal*, January 2015, p 68.

management. If the service provider entered into a long term inefficient contract, we would be required to include the associated costs in our forecast. These decisions are not part of our role and such an approach would be contrary to the incentive basis for the regulatory regime. Rather our role is to determine a forecast that we are satisfied reasonably reflects the opex criteria.

EMCa's independent review of labour and workforce practices found that ActewAGL relies predominantly on permanent staff employed under EBAs rather than contractors. This is due to it pursuing an internal resourcing strategy based on assumed future growth scenarios. ActewAGL also has not provided evidence of comprehensive, costed, strategic resourcing analysis that considered alternatives such as outsourcing. Further, ActewAGL's EBA provisions, while allowing forced redundancies, impose a very high associated cost. As a result, EMCa found evidence of inefficient management decisions in the past (such as restructuring) leading to redundancies but without evidence of net reductions in costs.⁷³

Our view is that this would not have been an efficient practice for a prudent service provider.

Rather, the need to incur redundancy costs is the outcome of ActewAGL's earlier labour related decisions. In line with the incentive regime, it is for ActewAGL to determine the appropriate response to excess labour needs and to bear the costs associated with its earlier decisions. ActewAGL could do this either within its regulated forecast by prioritising expenditure programs or with alternative sources of funding not recovered from customers.

Transition path

ActewAGL has submitted that the NEL and NER enable (and require) us to provide an amount for their transition to efficient expenditure in the event we make large reductions in opex. Their opinion is the NER provide us with sufficient discretion to include in their opex an amount for this transition or, in the alternative, the control mechanism provides a means of doing so. They further submit that to not provide such an amount would make their transition to efficient expenditure unachievable and not 'realistic' because they would need to immediately review and substantially reduce their opex, jeopardising the safety of the network.⁷⁴

We consider that a transition path is unnecessary when our forecast is sufficient to achieve the opex objectives. We have not been persuaded by any submissions that suggest it is more appropriate for the consumers, rather than service providers, to bear the cost of becoming more efficient. We have also received several submissions from

⁷³ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012–13*, April 2015.

⁷⁴ Ergon Energy, *Submission on the Queensland Electricity Distribution Regulatory Proposals 2015–16 to 2019–20 Issues Paper*, 30 January 2015, pp. 10-14; ActewAGL, *Revised Regulatory Proposal*, January 2015, pp. 257-267.

stakeholders that argue the opposite. That is, the type of approach advocated by service providers would be inconsistent with the NEL and NER.⁷⁵

If a transition is a "premium" above the efficient costs that a prudent operator would require, we cannot include that premium in our estimate of total forecast opex that we are satisfied reasonably reflects these opex criteria. Conversely, if a transition is included as part of a forecast that does reasonably reflect the opex criteria, no further premium is required or possible.

We also note that legal advice provided to ActewAGL contradicts the service providers' view. That advice states that if we applied a transition path pursuant to clause 6.12.1(11) of the NER we would likely be in error:⁷⁶

Although we think that the establishment of a "glide path" is open to the AER, having regard to the analysis above, there is a tension in this conclusion, in that it proceeds on the assumption that the NEO requires ActewAGL to be allowed forecast opex at a level which exceeds that which the AER has legitimately allowed to ActewAGL pursuant to clause 6.12.1(4)(ii) of the NER. In our view, it is difficult to imagine a circumstance in which that consequence might arise, without the AER's decision under clause 6.12.1(4)(ii) involving errors of the kind specified in section 71C of the NEL.

This legal advice suggests, in the alternative, that clause 6.12.1(4)(ii) allows the AER to use its discretion to take endogenous circumstances (such as the actual business structure vis-à-vis the prudent service provider's structure) into account because it would be inconsistent with the NEO for us to "presume, from the outset, that [our] discretion is circumscribed so that [we] must *only* consider the efficient costs that an objectively prudent distributor might incur. In particular, [it is asserted that] we have an obligation to consider the manner in which ActewAGL has structured its business in reliance on previous determinations made by [us], and its ability to transition to much lower levels of opex immediately."⁷⁷

⁷⁵ Origin Energy, *Submission to AER draft determination for NSW electricity distributors*, 13 February 2015, pp. 7-8; Energy Australia, *Submission to Australian Energy Regulator - Determination of allowable revenue for NSW electricity distribution networks*, 13 February 2015, p. 6; CCP, *Response to AER Draft Determination Re: ActewAGL Regulatory Proposal, 2014-19*, p. 10, 35-36; CCP, *Submission on NSW DNSPs regulatory proposals 2014-19, 15 August 2014*, p. 3; CCP, *Submission to AER- Responding to NSW draft determinations and revised proposals from electricity distribution networks*, February 2015, p. 55; EUAA, *Submission to Energex Revenue Proposal (2015/16 to 2019/20)*, 30 January 2015, pp. 22-29; EUAA, *Submission to Ergon Energy (Ergon) Revenue Proposal (2015/16 to 2019/20)*, 30 January 2015, pp. 22-29; QCOSS, *Understanding the long term interests of electricity consumers – Submission to the AER's Queensland electricity distribution determination 2015-2020*, pp. 57-69; Far North Queensland Regional Organisation of Councils, *AER Issues Paper - Queensland Electricity Distribution Regulatory Proposals 2015-16 to 2019-20*, 30 January 2015, pp. 3-4; Australian PV Institute, *APVI Submission to the AER on the Issues Paper on Ergon's and Energex's Network's Regulatory Proposals*, December 2014, pp. 5-6.

⁷⁶ Young and McClelland, *ActewAGL Distribution - AER draft decision on operating expenditure for 2015 to 2019 regulatory control period - memorandum of advice*, 13 February 2015, paras 95-105.

⁷⁷ Young and McClelland, *ActewAGL Distribution - AER draft decision on operating expenditure for 2015 to 2019 regulatory control period - memorandum of advice*, 13 February 2015, paras 68-94.

We have carefully considered this view and we are not convinced it is a sound interpretation of the NEO and the NER. It assumes that:

- service providers should expect that opex forecasts for future regulatory periods will be of the same order as opex forecasts for previous regulatory periods
- service providers are entitled to structure their business on that assumption.

Neither of these assumptions is correct. We determine the opex forecast (which forms part of the revenue which a service provider may recover from consumers) on the basis of the best information available to us at the time. If new benchmarking data shows that efficient costs are lower than previously thought, this information will be reflected in our determination.

The legal advice submitted by ActewAGL also assumes that we are requiring service providers to immediately change their circumstances. As set out above, this is not the case.

We consider that requiring service providers to bear their own transition costs is in both the short and long term interests of consumers. It will encourage service providers to make decisions that are prudent, reasonable and efficient in the long term. It will ensure consumers are not required to pay for inefficient expenditure or the consequences of inefficient expenditure. We consider that such incentives and consumer protections are likely to contribute substantially to the NEO.

This does not constrain service providers from taking time to transition to efficient levels or spend their opex forecasts on transition costs. As we explained in our draft decision, we do not prevent service providers from carrying out inefficient spending—including because of previous agreements, practices or arrangements. A service provider may have bound itself, contractually, to inefficient practices. However, the funds for inefficient spending should not be provided from a forecast which is assessed at the level of prudent and efficient spending. Accordingly, a service provider would need to fund any desired or required transition spending by:

- achieving greater efficiencies elsewhere in its practices; or
- paying lower dividends to shareholders.

These are the choices a competitive business must make, where efficiencies are revealed by a market.⁷⁸ These are the choices a regulated business, funded by consumers, should also make, where efficiencies are revealed by robust analysis. We consider that if this results in a disparity in profits between more and less efficient service providers, it indicates our approach is creating appropriate incentives and a better approximation of a workably competitive market.

⁷⁸ Second reading speech, National Electricity (South Australia) (National Electricity Law—Miscellaneous Amendments) Amendment Bill 2007, p 6.

7.5.3 Financeability

With its revised regulatory proposal, ActewAGL submitted a report from CEPA.⁷⁹ CEPA considered our draft decision alternative opex forecasts and the 'speed to reduce the efficiency gap' would put at risk the achievement of the NEO because it could impact on the service providers' financial viability.⁸⁰

The financeability implications of our decisions do not form part of our obligations under the NER. CEPA acknowledges this, but suggests that such an obligation may be implied into the NEO.⁸¹ Financeability is an underlying theme of ActewAGL's revised regulatory proposal. In particular, it raises the magnitude of our draft decision opex and capex adjustments as a driver of financeability concerns.⁸² As a result, we have examined CEPA's submission in the overview to this final decision and in Attachment 20.

We do not dispute CEPA's findings that ActewAGL may face financeability concerns under the restrictive assumptions that are used by CEPA in their analysis. CEPA undertook its analysis under the assumptions that ActewAGL will not make any changes to its level of opex or capex in response to our decision. The analysis also assumes that inefficient costs should be funded by consumers and not by shareholders through reduced returns. We do not find this to be appropriate.

In order to arrive at a more realistic conclusion on financeability we conducted our own analysis and tested various assumptions of ActewAGL achieving efficiencies over the regulatory period. In summary, our analysis demonstrates that our estimate of the total forecast opex that reasonably reflects the opex criteria will not adversely affect ActewAGL's financial viability.

7.6 Interrelationships

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

- The impact of cost drivers that affect both forecast opex and forecast capex. For instance forecast maximum demand affects forecast augmentation capex and forecast output growth used in estimating the rate of change in opex.
- The approach to assessing rate of return, to ensure there is consistency between our determination of debt raising costs and the rate of return building block.
- Changes to the classification of services from standard control services to alternative control services.

⁷⁹ ActewAGL, *Revised Regulatory Proposal, Attachment C3*, January 2015.

⁸⁰ CEPA, *Benchmarking and setting efficiency targets for the Australian DNSPs, (ActewAGL)*, 19 January 2015, p. 55.

⁸¹ CEPA *Benchmarking and setting efficiency targets for the Australian DNSPs, (ActewAGL)*, 19 January 2015, pp. ix-x.

⁸² For example, ActewAGL, *Revised Regulatory Proposal*, January 2015, pp. vii-vix, 260-266.

- Consistency with the application of incentive schemes - in particular our decision not to subject any expenditure to the EBSS during the 2015–19 regulatory control period.
- Concerns of electricity consumers identified in the course of its engagement with consumers.

While capex is the subject of a separate forecast, many service providers have made broad statements about the combined effect of opex and capex reductions on safety.⁸³ In addition, the extent to which costs are expensed or capitalised by a service provider, or the extent to which there may be appropriate substitution between capex and opex when developing forecasts, are important interrelationships that we take into account when making our decision.

7.7 Assessment of opex factors

In deciding whether or not we are satisfied the service provider's forecast reasonably reflects the opex criteria we have regard to the opex factors.⁸⁴ Table 7.6 summarises how we have taken the opex factors into account in making our final decision.

Table 7.6 Our consideration of opex factors

Opex factor	Consideration
<p>The most recent annual benchmarking report that has been published under rule 6.27 and the benchmark operating expenditure that would be incurred by an efficient Distribution Network Service Provider over the relevant regulatory control period.</p>	<p>There are two elements to this factor. First, we must have regard to the most recent annual benchmarking report. Second, we must have regard to the benchmark operating expenditure that would be incurred by an efficient distribution network service provider over the period. The annual benchmarking report is intended to provide an annual snapshot of the relative efficiency of each service provider.</p> <p>The second element, that is, the benchmark operating expenditure that would be incurred an efficient provider during the forecast period, necessarily provides a different focus. This is because this second element requires us to construct the benchmark opex that would be incurred by a hypothetically efficient provider for that particular network over the relevant period.</p> <p>We have used several assessment techniques that enable us to estimate the benchmark opex that an efficient service provider would require over the forecast period. These techniques include economic benchmarking, opex cost function modelling, category analysis and a detailed review of ActewAGL's labour and workforce practices and vegetation management. We have used our judgment based on the results from all of these techniques to holistically form a view on the efficiency of ActewAGL's</p>

⁸³ For example, Essential: *Attachment 1.1 [CONFIDENTIAL] Statement of Gary Humphreys Chief Operating Officer Essential Energy; Attachment 1.2 Asset System Failure Safety Risk Assessment; Attachment 1.9 Potential AER Impacts.*

⁸⁴ NER, clause 6.5.6(e).

Opex factor	Consideration
<p>The actual and expected operating expenditure of the distribution network service provider during any proceeding regulatory control periods.</p>	<p>proposed total forecast opex compared to the benchmark efficient opex that would be incurred over the relevant regulatory control period.</p> <p>Our forecasting approach uses the service provider's actual opex as the starting point. We have compared several years of ActewAGL's actual past opex with that of other service providers to form a view about whether or not its revealed expenditure is appropriate to rely on it as the basis for forecasting required opex in the forthcoming period.</p>
<p>The extent to which the operating expenditure forecast includes expenditure to address the concerns of electricity consumers as identified by the distribution network service provider in the course of its engagement with electricity consumers.</p>	<p>We understand the intention of this particular factor is to require us to have regard to the extent to which service providers have engaged with consumers in preparing their regulatory proposals, such that they factor in the needs of consumers.⁸⁵</p> <p>We have considered the concerns of electricity consumers as identified by ActewAGL in assessing its proposal.</p>
<p>The relative prices of capital and operating inputs</p>	<p>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 in the use of both capital and operating inputs with respect to the prices of capital and operating inputs.</p>
<p>The substitution possibilities between operating and capital expenditure.</p>	<p>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.</p> <p>In developing our benchmarking models we have had regard to the relationship between capital, opex and outputs.</p> <p>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.</p> <p>Further, we considered the different capitalisation policies of the service providers' and how this may affect opex performance under benchmarking.</p>
<p>Whether the operating expenditure forecast is consistent with any incentive scheme or schemes that apply to the distribution network service provider under clauses 6.5.8 or 6.6.2 to 6.6.4.</p>	<p>The incentive scheme that applied to ActewAGL's opex in the 2009–14 regulatory control period, the EBSS, was intended to work in conjunction with a revealed cost forecasting approach.</p> <p>In this instance, we have forecast efficient opex based on benchmark efficient service provider. We have considered this in deciding how the EBSS should apply to ActewAGL in the 2009–14 regulatory control period and the 2014–19 period.</p>

⁸⁵ AEMC, *Rule Determination*, 29 November 2012, pp. 101, 115.

Opex factor	Consideration
The extent the operating expenditure forecast is referable to arrangements with a person other than the distribution network service provider that, in our opinion, 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 who 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 6.6A.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 final decision.
The extent the distribution 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 decision.

Source: AER analysis.

The NER require that we notify the service provider in writing of any other factor we identify as relevant to our assessment, prior to the service provider submitting its revised regulatory proposal.⁸⁶ Table 7.7 identifies these factors.

Table 7.7 Other factors we have had regard to

Opex factor	Consideration
Our benchmarking data sets, including, but not necessarily limited to: <ol style="list-style-type: none"> 1. data contained in any economic benchmarking RIN, category analysis RIN, reset RIN or annual reporting RIN 2. any relevant data from international sources 3. data sets that support econometric modelling and other assessment techniques consistent with the approach set out in the Guideline as updated from time to time.	This information may potentially fall within opex factor in 6.5.6(e)(4). However, for absolute clarity, we are using data we gather from NEM service providers, and data from service providers in other countries to provide insight into the benchmark operating expenditure that would be incurred by an efficient and prudent distribution network service provider over the relevant regulatory period.
Economic benchmarking techniques for assessing benchmark efficient expenditure including stochastic frontier analysis and regressions utilising functional forms such as Cobb Douglas and Translog.	This information may potentially fall within opex factor 6.5.6(e)(4). For clarity, and consistent with our approach to assessment set out in the Guideline, we have regard to a range of assessment techniques to provide insight into the benchmark operating expenditure that an efficient and prudent service provider would incur over the relevant regulatory control period.

Source: AER analysis.

⁸⁶ NER, clause 6.5.6(e)(12).

A Base year opex

In this appendix, we present our detailed analysis of ActewAGL's base year opex. Base year opex is the starting point for our approach to developing an estimate of the total forecast opex we consider meets the requirements of the NER.⁸⁷ We use this approach to assess each of the service providers' total forecast opex proposals. If we are not satisfied the service providers' opex proposals reasonably reflect the opex criteria, our estimates form the basis of any adjustments we will make.⁸⁸ This approach is set out in the Guideline and is in accordance with principles that have been endorsed by the AEMC.⁸⁹

To ensure our estimate of total forecast opex reasonably reflects the opex criteria, we must be satisfied the starting point is an appropriate reflection of the ongoing efficient costs a prudent operator would require in the forecast period. If we use the service provider's revealed expenditure that includes, for example, inherent inefficiencies as the basis for a forecast, the forecast will also contain these inefficiencies. Therefore, if we find that the base year expenditure is inefficient or in some other way unrepresentative of the expenditure needed to achieve the opex objectives in the forecast period, we adjust it.

When presenting our detailed analysis of base opex in this appendix, we explain how we have taken account of the issues raised in the revised proposals and the submissions made by various stakeholders on our draft decision and the revised proposals. To the extent this involves additional analysis, we present it. The structure of this appendix is:

- Section A.1 sets out a summary of our findings and base year adjustments and the extent to which they have changed since our draft decision
- Section A.2 provides an exposition of ex ante incentive regulation and the role of benchmarking
- Section A.3 outlines our approach to assessing base opex
- Section A.4 presents the results of our benchmarking
- Section A.5 presents the results of our category analysis and qualitative review
- Section A.6 contains our assessment of operating environment factors
- Section A.7 explains our conclusions on base opex and whether we propose to make any adjustments to base year opex for the purposes of our constructing an alternative total opex forecast.

⁸⁷ As we explain in the opex attachment, this is the efficient total forecast opex we consider a prudent service provider would require to achieve the opex objectives in the forthcoming period.

⁸⁸ NER, clauses 6.5.6(c) and (d) and 6.12.1(4).

⁸⁹ AER, Expenditure forecast assessment guideline, November 2013, p 7; AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, p. 112.

A.1 Summary

In this section we provide a summary of our findings and our view of the base year opex that we are satisfied represents a starting point for total forecast opex that reasonably reflects the opex criteria.

A.1.1 Final decision adjustments

Table A.1 contains our final determination estimate of base year opex.

Table A.1 Final determination estimate of efficient base year opex (\$million 2013–14)

	ActewAGL
Revealed base opex (adjusted) ^a	67.2
AER base opex	45.1
Difference	22.1
Percentage base opex reduction	32.8%

Note: (a) This number is the revealed 2012–13 opex, so it differs from the starting number in Table 7.4, which is average opex over 2006–13. We have adjusted ActewAGL's revealed opex for its new CAM and jurisdictional schemes.

Source: AER analysis.

We are not satisfied that ActewAGL's revealed expenditure in 2012–13 is an appropriate starting point for determining our estimate of total forecast opex. We take this view based on quantitative and qualitative analysis using several assessment techniques, which include:

- review of ActewAGL's regulatory proposal
- four economic benchmarking techniques—three econometric and one index-based—including consideration of operating environment factors
- partial performance indicators
- category analysis
- targeted detailed review of certain types of expenditure.

We are satisfied that material inefficiency exists in ActewAGL's revealed expenditure in the base year. Therefore, and in accordance with the process we outlined in the Guideline, we have reduced ActewAGL's revealed expenditure to estimate a base year opex amount that we are satisfied would represent an appropriate starting point for developing our total opex forecast.

In this final decision, we have made two changes to our approach since our draft decision, which impact on the base year reduction we have made in developing our alternative forecast.

First, we have adjusted the benchmark comparison point for determining whether a service provider's revealed opex is materially inefficient. We explain our reasons for this change below and in detail in section A.7.

Second, we have modified our approach to determining the operating environment factor adjustments. This modification would usually increase the allowance for exogenous differences between ActewAGL and the benchmark comparison point. However, due to ActewAGL's change in capitalisation approach in the forecast period, a proportion of one of the key operating environment factors from the draft decision now forms part of our estimate of total forecast capex. This means the operating environment factor adjustment is 23 per cent, which is lower than the draft decision adjustment of 30 per cent. However, the combined opex and capex impact of this change is an increase to forecast expenditure. We explain our reasons for this change in section A.6.

Notwithstanding the lower operating environment factor adjustment, the reduced benchmark comparison point results in a smaller reduction to revealed opex than that from the draft decision.

A.1.2 Why ActewAGL's revealed opex is not an appropriate starting point for estimating total forecast opex

Our analysis shows that it would not be appropriate to rely on ActewAGL's revealed opex as the starting point for estimating total forecast opex that reasonably reflects the opex criteria. Our benchmarking demonstrates that ActewAGL's revealed opex is inefficient. Other quantitative techniques as well as the qualitative review of labour and vegetation management costs by Energy Market Consulting Associates (EMCa) support the benchmarking findings.

Our review

As set out in the Guideline, our preference is to rely on revealed expenditure as the basis for determining our estimate of total forecast opex that reasonably reflects the opex criteria.

However, we cannot simply assume that revealed expenditure for 2012-13 is reflective of the opex criteria for the 2014–19 period. We use benchmarking to test ActewAGL's revealed expenditure against that of its peers.⁹⁰ We then use category analysis and detailed review of significant cost categories to see if they are consistent with our

⁹⁰ AER, *Expenditure Forecast Assessment Guideline*, November 2013, pp. 7-8.

benchmarking findings. This approach is set out in the Guideline and in section A.3 (which details our assessment approach for base opex).

Benchmarking

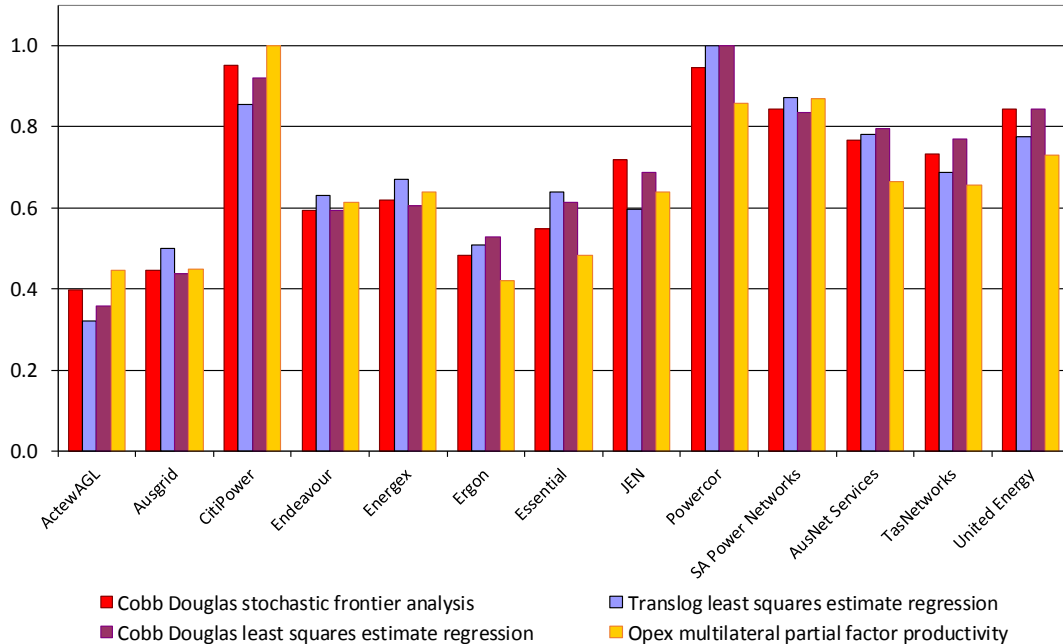
In the draft decision, we assessed ActewAGL's revealed expenditure using economic benchmarking and partial performance indicators (PPIs). We have not changed our approach to using benchmarking since the draft decision. The benchmarking techniques we rely on in this final decision are the same.

Economic benchmarking

For this final decision, we continue to rely on the economic benchmarking techniques developed by Economic Insights for assessing the relative efficiency of service providers compared to their peers. Economic Insights developed four benchmarking techniques that specifically compare opex performance, using data submitted by all service providers, over the period 2006 to 2013.

Figure A.1 presents the results of each of Economic Insights' opex models (stochastic frontier analysis (SFA), econometric regressions and opex MPFP) for each service provider in the NEM.

Figure A.1 Econometric modelling and opex MPFP results (average efficiency scores for 2006 to 2013)



Source: Economic Insights, 2014.

Each model differs in terms of estimation method or model specification and accounts for key operating environment factors (such as differences in customer density and degree of network undergrounding that may differentiate service providers) to differing

degrees. Accordingly, the results will never be identical. However, Figure A.1 demonstrates that the results of the four models are consistent. All models show that the efficiency of ActewAGL's revealed expenditure does not compare favourably with that of many of its peers.

Our preferred model is SFA (in red on the figure above) because it can directly estimate efficiency scores and has superior statistical properties.⁹¹ The best performing business under this model is CitiPower, with a score of 0.95. We refer to CitiPower as the 'frontier' firm throughout this appendix.

Section A.4 discusses economic benchmarking in more detail. Our benchmarking techniques and benchmarking results were the subject of submissions filed in response to our draft decision. In considering the various points raised in submissions, we have been able to further test the robustness of our approach. The submissions we received on benchmarking and the manner in which we have taken those submissions into account in our final decision is also discussed in section A.4. Economic Insights' final decision report provides further detail, including analysis of the positions and alternative models advanced by ActewAGL's consultants.⁹²

Partial performance indicators

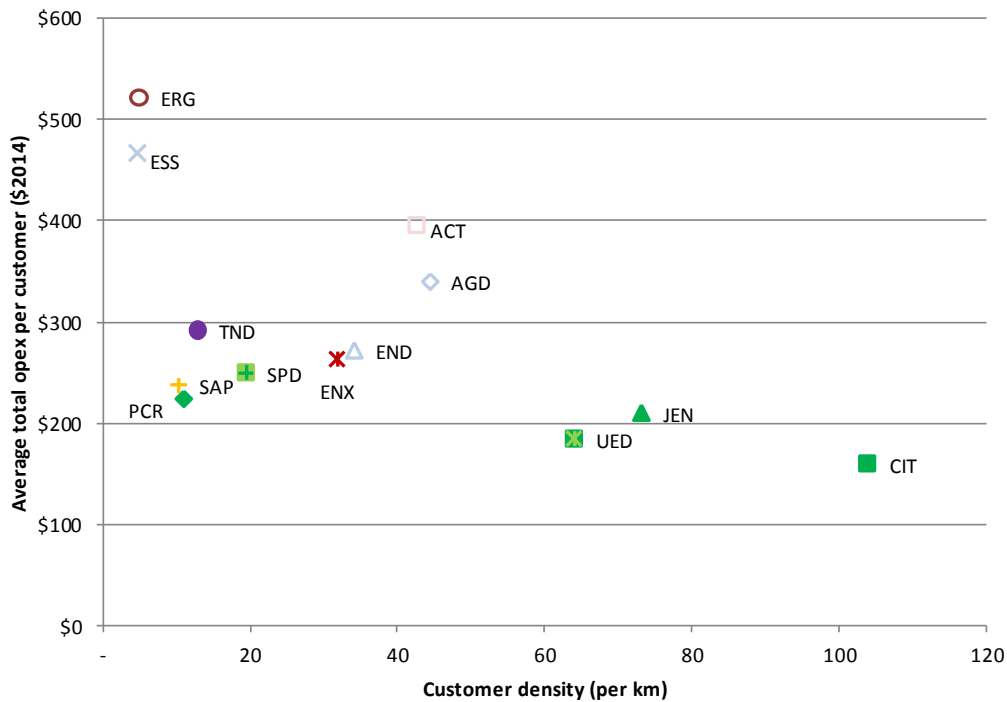
PPIs are a simplistic form of benchmarking. They measure the ratio of total output and one input factor. They are often used as they are easy to calculate and understand. However when used in isolation their results should be interpreted with caution because they are not as robust as our economic benchmarking techniques that relate inputs to multiple outputs using a cost function.

When examined in conjunction with other indicators they can provide supporting evidence of efficiency. We consider the PPI results do provide further evidence to support the results of our economic benchmarking techniques. Figure A.2, a key metric, compares average annual opex per customer for each service provider.

⁹¹ Economic Insights, Economic Benchmarking Assessment of Operating Expenditure for NSW and ACT Electricity DNSPs, November 2014, p. v. (Economic Insights, 2014).

⁹² Economic Insights, Response to Consultants' Reports on Economic Benchmarking of Electricity DNSPs, April 2015 (Economic Insights, 2015).

Figure A.2 Average annual opex per customer for 2009 to 2013 against customer density (\$2013-14)



Source: Economic benchmarking RIN data.

Note: ACT = ActewAGL, AGD = Ausgrid, CIT = CitiPower, END = Endeavour, ENX = Energex, ARG = Ergon, ESS = Essential, JEN = Jemena, PCR = Powercor, SAP = SA PowerNetworks, SPD = AusNet, TND = TasNetworks, UED = United Energy.

Figure A.2 demonstrates a clear demarcation between ActewAGL and all other distributors except Essential Energy and Ergon Energy.

'Per customer' PPIs tend to be less favourable towards rural service providers who typically operate more assets per customer. We must bear this in mind when we consider the results in Figure A.2. We would expect ActewAGL to compare more favourably to Powercor due to its higher customer density, but less favourably to CitiPower because CitiPower is very dense.

PPIs do not explicitly account for operating environment differences and examine only one output. However, bearing these limitations in mind, our PPI metrics (opex per customer and total user cost per customer) support the economic benchmarking results. We consider these PPIs remain useful tools of comparison if their limitations are understood. For example, bearing in mind the lower customer density of Essential Energy and Ergon Energy, ActewAGL's performance in Figure A.2 is consistent with the economic benchmarking results, which indicate that it has the lowest efficiency scores of all service providers. Further, our first annual benchmarking report contains

additional PPIs that examine different outputs. These PPIs similarly show ActewAGL generally performs poorly compared to its peers.⁹³ PPIs were the subject of some submissions from stakeholders. We consider PPIs in more detail in section A.4.

Incorporating differences between service providers

While Economic Insights' benchmarking models account for key differences between service providers—customer density, network line length and degree of network undergrounding, for example—they do not account for all differences. This is because accounting for too many differences in the model can lead to unstable results. The available data on operating environment differences is also a limiting factor,

Accordingly, in our draft decision, we conducted a detailed examination of the operating environment factors (OEFs) that might impact the benchmark performance of service providers. In the draft decision, we concluded that we needed to increase ActewAGL's efficiency score by 30 per cent to account for exogenous differences particular to its network. The most significant exogenous difference between the best performing service providers and ActewAGL is the proportion of subtransmission network over 66kV. We considered this difference would adversely impact ActewAGL's efficiency score and should not be interpreted as inefficiency.

Following further analysis, in this final decision, we have reviewed which factors we will adjust for and as a result of this analysis have decreased the adjustment from 30 per cent to 23 per cent. As explained above, this decrease is due to a proportion of one operating environment factor now forming part of our estimate of total forecast capex. However, the net impact of this change is an increase to our estimates of forecast expenditure. Our assessment of operating environment factors and how they contribute to a 23 per cent adjustment is set out in detail in section A.5.

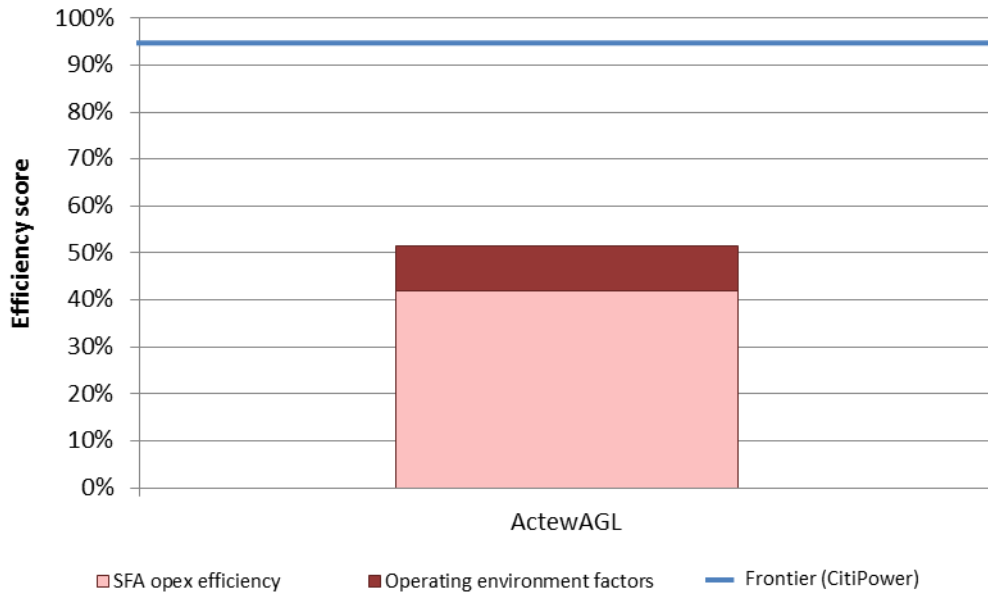
Figure A.3 shows the efficiency score for ActewAGL compared to the frontier distributor (CitiPower):

- using the Cobb Douglas SFA model (Economic Insights' recommended model for quantifying an adjustment to revealed opex) and
- incorporating the allowance for exogenous differences in operating environments.

Our operating environment factor adjustment is a percentage adjustment relative to the frontier. Therefore, the operating environment factor adjustment in Figure A.3 will not reflect the absolute percentage reported above. That is, the dark red proportion represents 23 per for the frontier efficiency score rather than an addition of 23 percentage points on top of the SFA opex efficiency score.

⁹³ AER, Electricity distribution network service providers—annual benchmarking report, November 2014, Appendix A.

Figure A.3 Comparison of ActewAGL's raw SFA efficiency score to the frontier, adjusted for operating environment factors



Source: AER analysis.

Note: The 'roll forward' is the process of adjusting average period efficiency (for 2006-2013) to reflect the 2012–13 base year. We explain this section A.7 in our discussion of the adjustment process.

Figure A.3 demonstrates that, even allowing for operating environment factors, ActewAGL has an efficiency score well below the frontier efficiency score of 95 per cent using our SFA benchmark model.

We used additional assessment techniques to see if they supported the benchmarking results and to help us understand what might be driving differences in benchmark performance.

Category analysis and qualitative assessment

In our draft decision, we used more granular assessment techniques in two stages as a means of understanding what drives the benchmarking results. In the first stage, we examined ActewAGL's regulatory proposal and conducted category analysis of key opex categories. We have also applied this assessment technique in making our final decision.

ActewAGL stated in its regulatory proposal that one of the reasons it overspent the opex forecast for the 2009–14 period was due to high labour expenditure. This suggested labour costs could be one of the drivers of ActewAGL's benchmarking performance. ActewAGL's regulatory proposal also attributed increased vegetation

management, following higher than average rainfall in prior years, as another reason it overspent against its opex forecast in 2012–13.⁹⁴

Further, category analysis showed ActewAGL had 'very high' costs on labour and vegetation management metrics compared to most of its peers.

Accordingly, (and because these categories account for a significant proportion of ActewAGL's opex—labour is approximately 80 per cent⁹⁵) for the second stage, we conducted detailed reviews of labour and vegetation management opex. Through our detailed review, we found significant issues in these categories of ActewAGL's opex, which we considered was evidence of base year inefficiency, supporting our benchmarking results.

For our final decision, we engaged EMCa to conduct an independent review of labour and vegetation management. EMCa has reviewed the material we examined in making our draft decision and ActewAGL's revised proposal response to our draft decision findings. EMCa's report also reflects and responds to comments on the draft version of its report that we provided to ActewAGL for comment.⁹⁶ EMCa's overall findings concur with our draft decision view that ActewAGL's labour and vegetation management practices are likely drivers of its poor benchmarking performance.⁹⁷

EMCa's detailed review findings

EMCa's overall findings for labour costs support the systemic issues we identified in our draft decision. EMCa considers:⁹⁸

- there is evidence that ActewAGL's work practices, processes and systems in 2012–13 were ineffective. EMCa considered that this led to inefficient use of labour in the office and field. This inefficiency is characterised by duplication of effort in work planning and scheduling, loss of field productivity through ineffective works management and through ineffective data and information management
- ActewAGL's labour levels were not reasonably efficient in 2012–13, noting that ActewAGL has steadily increased its ASL based on assumed future growth scenarios and adopting an internal resourcing strategy. EMCa considered that if ActewAGL had outsourced more of its work, it would likely have benefited from increased labour flexibility and reduced operating costs.
- there was a lack of compelling evidence to demonstrate that ActewAGL's labour costs in 2012–13 were reflective of an efficient service provider. EMCa consider

⁹⁴ ActewAGL, Regulatory Proposal, pp. 214–218.

⁹⁵ ActewAGL Annual Reporting RIN 2012-13, tab 12 'Cost Categories.' Note that 'Other' expenditure category consists mainly of corporate management overheads per email received on 13 October 2014.

⁹⁶ ActewAGL, Response to request AER ACTEW 060 of 18 February 2015, received 4 March 2015.

⁹⁷ EMCa, Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13, April 2015, pp. i-iii.

⁹⁸ EMCa, Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13, April 2015, pp. i-iii.

this was evident by the relatively high level of internal resources used and the extent to which work was outsourced on an hourly rate bases for the urgent clearance of vegetation.

EMCa's overall findings for vegetation management are:⁹⁹

- ActewAGL did not act prudently and efficiently to manage costs associated with increased vegetation growth that occurred prior to 2012–13 because its vegetation management practices and its strategic and tactical responses were inadequate;
- evidence of inefficient vegetation management costs in 2012–13 exists due to the manual processes between the office and field and the extent of clearance work that was deemed to be urgent, and which was therefore undertaken with a resultant higher cost. It is EMCa's view that a service provider acting to efficiently minimise costs would have incurred a lower level of urgent clearance work.

We discuss our labour and vegetation management review findings in more detail in section A.5.

Adjustments to revealed opex

We consider the evidence shows that there is a gap between the revealed costs in the base year and the benchmark opex that an efficient provider would incur. In these circumstances we may need to make an adjustment to ActewAGL's revealed base opex. Making an adjustment involves consideration of the appropriate technique, the appropriate benchmark comparison point and the appropriate manner in which to make the adjustment. Our approach of using benchmarking as a basis for making adjustments to opex is consistent with Ofgem's approach.¹⁰⁰

The best technique for the adjustment

Consistent with our draft decision approach, we continue to adopt Economic Insights' recommendation to rely on the Cobb Douglas SFA model as the preferred technique upon which we base an adjustment to revealed opex. This technique directly estimates efficiency scores and has superior statistical properties.¹⁰¹

The benchmark comparison point

In our draft decision, we adopted a benchmark comparison point based on the weighted average efficiency scores of all service providers with efficiency scores

⁹⁹ EMCa, Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13, April 2015, pp. ii–iii.

¹⁰⁰ Noting that Ofgem now assesses total expenditure rather than capex and opex separately. See, for example, Ofgem, RIIO-ED1–Final determinations for the slow-track electricity distribution companies-Overview, 28 November 2014, Chapter 4.

¹⁰¹ Economic Insights, Economic Benchmarking Assessment of Operating Expenditure for NSW and ACT Electricity DNSPs, November 2014, p. v.

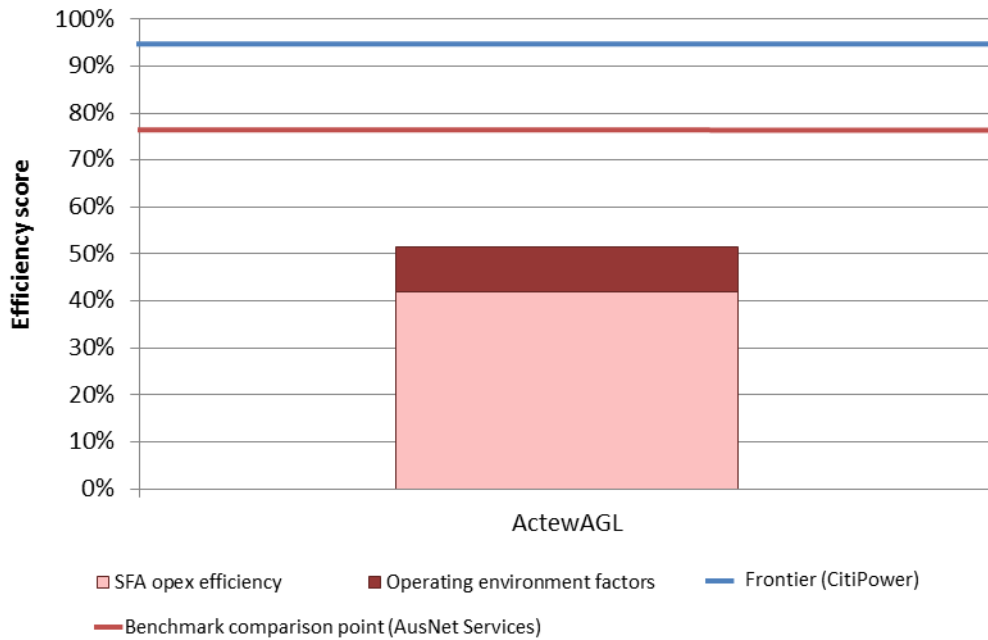
greater than 0.75 to account for potential data and modelling issues. This weighted average reduced the efficiency target from 0.95 (the frontier firm) to 0.86.

For the reasons we outline in detail in section A.7, we have reconsidered the benchmark comparison point in our final decision. We have decided that, on balance, a more appropriate benchmark comparison point is the efficiency score for the business at the upper third (top 33 per cent) of companies in the benchmark sample (represented by AusNet Services). It reduces the benchmark comparison point from 0.86 (used in the draft decisions) to 0.77. We have done this because:

- this recognises that more than a third of the service providers in the NEM, operating in varied environments, are able to perform at or above our benchmark comparison point. We are confident that a firm that performs below this level is therefore spending in a manner that does not reasonably reflect the opex criteria. An adjustment back to this appropriately conservative point is sufficient to remove the material over-expenditure in the revealed costs while still incorporating an appropriately wide margin for potential modelling and data errors for the purposes of forecasting
- given it is our first application of benchmarking, it is appropriate to adopt a cautious approach
- our draft decision averaging approach produced an unusual result for service providers ranked in the top quartile of efficiency scores, but below the average of that top quartile. These service providers would require an efficiency adjustment to reach the average benchmark comparison point (because their scores are below the average) despite being efficient enough to be ranked in the top quartile and, hence, included in the average. We consider this approach better achieves the NEO and RPP because it is sufficiently conservative to avoid the risks associated with undercompensating the service provider but also promotes efficiency incentives.

Figure A.4 shows the efficiency score using our SFA model for ActewAGL compared to our benchmark comparison point, represented by the red line (AusNet Services). The blue line represents the frontier firm (CitiPower).

Figure A.4 Comparison of ActewAGL's raw SFA efficiency score to the benchmark comparison point, adjusted for operating environment factors



Source: AER analysis.

Note: (1) The raw SFA efficiency scores displayed are 'rolled forward' from a period-average basis (for 2006-2013) to the 2012–13 base year. We explain this in section A.7 in our discussion of the adjustment process.
 (2) As explained above, our operating environment factor adjustment is a percentage adjustment relative to the benchmark comparison point. Therefore, the operating environment factor adjustment in Figure A.4 (in dark red) will not reflect the adjustment of 23 per cent to the frontier.

Figure A.4 demonstrates the difference between the frontier firm and our modified benchmark comparison point. Despite this lower target, a substantial gap remains between ActewAGL's efficiency score, adjusted for operating environment factors, and the benchmark comparison point. This is explained in more detail in section A.7.

The adjustment process

The adjustment process involves using the SFA model (our most robust benchmarking technique) to estimate average efficiency over the 2006–13 period. We then adjust the SFA result to take into account the reduced benchmark comparison point and operating environment factor allowance that we discussed above. Because we compare average efficiency, we must 'roll forward' the average efficient opex to the 2012–13 base year, because that is the relevant starting point for estimating total forecast opex that reasonably reflects the opex criteria. We do this by applying the

measured rate of change, which accounts for the difference between output, price and productivity in the 2012–13 base year and at the period average (2006 to 2013).¹⁰²

A key reason we use average period efficiency scores is because they reduce the impact of year–specific fluctuations not under the control of the service provider (such as weather conditions). Given the sample period is only eight years, Economic Insights considers the average is sufficiently recent to avoid potential loss of current relevance.¹⁰³

Average efficiency results also provide us with an estimate of underlying recurrent expenditure not influenced by year on year changes, which we require for the Guideline approach to estimating total forecast opex.

We discuss our adjustment in detail in section A.7.

A.1.3 Summary responses to ActewAGL's submissions

In its revised regulatory proposal, ActewAGL submitted a large amount of material commenting on our draft decision approach to assessing opex. Key submissions made by ActewAGL that are relevant to base year opex include:

- our approach "gave primacy to...benchmarking analysis" and, therefore, is inconsistent with the NEL and the NER
- our benchmarking is "fundamentally flawed" and not supported by our other assessment techniques
- we did not adequately consider ActewAGL's regulatory proposal or its individual circumstances.

Throughout this appendix, we respond to the submissions put forward by ActewAGL and other stakeholders in the course of explaining our approach and findings. This section provides an overview of our response to the above three key submissions.

Reasonable weight placed on benchmarking

ActewAGL consider that we have placed undue weighting on the benchmarking results to set its allowance, which is not in line with international best practice.¹⁰⁴ ActewAGL submits our decision on forecast opex relies exclusively on benchmarking to both reject the companies' proposed forecast opex and as the basis for its substituted opex. In so doing, ActewAGL submits that our draft decision has not properly addressed the requirements of the opex criteria, having regard to the 11 opex factors under the NER.

¹⁰² This differs slightly from the rate of change we apply in Appendix B. While the approach is the same, to trend base opex forward over the forecast period, we apply forecast growth. When rolling forward average efficient opex, we apply measured growth because we can observe what has actually changed between the period average and the base year.

¹⁰³ Economic Insights, Response to Consultants' Reports on Economic Benchmarking of Electricity DNSPs, April 2015, section 4.

¹⁰⁴ ActewAGL Revised regulatory proposal, pp. 126, 133–134.

Additionally, it considers using benchmarking in preference to revealed costs is inconsistent with the regulatory incentive regime. This, ActewAGL submits, amounts to effectively disregarding our 2009–14 distribution determination of efficient forecast opex.¹⁰⁵

We do not agree. As outlined in the Guideline, in our draft decision and in this final decision, we have relied on several assessment techniques, both quantitative and qualitative to assess ActewAGL's proposed forecast opex. In doing so, we have used the same techniques as the basis for determining substitute opex. We have used our discretion to give benchmarking prominent, but appropriate weight based on its robustness and utility.

We have assessed ActewAGL's proposal using the techniques outlined in the Guideline. We have engaged with the details ActewAGL's proposal to the extent it is relevant to our assessment of base opex. It was the starting point for our assessment. Ultimately, however, we must form a view on the amount of a service provider's forecast, not the specific contents of the proposal.¹⁰⁶

Further, since our 2009–14 determination, we have developed new techniques that give us better insight into assessing expenditure and have new information that we are able to take into account. All stakeholders should expect us to use new techniques and information when they become available.¹⁰⁷ This new information demonstrates that ActewAGL's revealed costs are inefficient. However, we have not moved away from revealed costs—we use them when it is appropriate to do so. Rather, we have used new techniques to ensure that we are better able to make a decision that reasonably reflects the opex criteria for the future. Our approach represents a refinement of our longstanding approach to assessing opex.

We discuss these issues in detail in section A.3.

Benchmarking is robust, reliable and reasonable

ActewAGL has submitted (and used consultants to support its view) that our benchmarking is fundamentally flawed due to, for example:¹⁰⁸

- mechanistic application
- unjustified model selection
- data comparability and reliability

¹⁰⁵ ActewAGL, Revised Regulatory Proposal, pp. 119-125, 134-139.

¹⁰⁶ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, p. 93.

¹⁰⁷ We have indicated in previous decisions and in defending those decisions our preference to use up to date information where possible. The Tribunal has endorsed this approach and indicated a similar preference: see for example Application by Ergon Energy Corporation Limited (Labour Cost Escalators) (No 3) [2010] ACompT 11 at [61] to [62].

¹⁰⁸ ActewAGL, Revised Regulatory Proposal, pp. 125–181.

- an incorrect approach to establishing and adjusting the efficiency frontier.

Our view is that Economic Insights' benchmarking is robust and reliable. The model specification and estimation methods are superior to the alternatives proposed by the service providers and their consultants. In addition, the Australian data we are using are robust because we have gathered, tested and validated it over three years of consultation with service providers and other interested stakeholders. The international data Economic Insights has used (to improve the precision of the models) has been used by the electricity regulators in the respective jurisdictions in recent regulatory decisions.¹⁰⁹

Economic Insights responds to ActewAGL's and other service providers' submissions in detail in its final decision report.¹¹⁰ We also discuss this further in section A.4.

Regulatory proposals and exogenous circumstances are considered

ActewAGL submits that by relying on benchmarking as part of our assessment approach, we have:

- not started our assessment with its regulatory proposal, which is contrary to the statutory scheme established by the NER¹¹¹
- used only one environmental variable in our preferred model despite recognising the importance of exogenous factors; as a result, important environmental variables have been omitted¹¹²
- made arbitrary and unsubstantiated adjustments post-modelling.¹¹³

Benchmarking is a tool we use to assess regulatory proposals. We also use it in setting a substitute forecast if we are not satisfied that a service provider's proposed forecast reasonably reflects the opex criteria. We have considered ActewAGL's proposal in significant detail in conducting our assessment. We have conducted detailed reviews and analysed ActewAGL's forecasting approach. We also have had regard to ActewAGL's individual circumstances through our review of operating environment factors (see section A.6) to the extent required by the NER and in accordance with the intent of the AEMC.

We disagree with ActewAGL's view that the NER require us to consider its endogenous circumstances. The AEMC is clear that while exogenous circumstances

¹⁰⁹ Economic Insights, Response to Consultants' Reports on Economic Benchmarking of Electricity DNSPs, April 2015, section 3.2.

¹¹⁰ Economic Insights, Response to Consultants' Reports on Economic Benchmarking of Electricity DNSPs, April 2015, section 3.10.

¹¹¹ ActewAGL, Revised proposal, pp. 123–125.

¹¹² ActewAGL Revised Regulatory Proposal, pp. 153–166.

¹¹³ ActewAGL Revised Regulatory Proposal, pp. 153–166.

are relevant and should be accounted for, endogenous circumstances should not be considered.¹¹⁴

We discuss these issues in detail in section A.3.

¹¹⁴ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, p. 113. See also pp. viii, 25, 98, 107-108.

A.2 Ex ante incentive regulation and the role of benchmarking

In its revised proposal, ActewAGL has questioned our approach and our interpretation of our role under the NEL and NER. This section explains ex ante regulation, and how our approach to benchmarking fits appropriately within the legal and regulatory framework.

A.2.1 Ex ante incentive regulation

Network services are ‘natural’ monopolies with little scope in any given location for a competitor to duplicate the network efficiently.¹¹⁵ Monopoly businesses do not have an incentive to set prices at an efficient level because there is no competitive discipline on their decisions. They do not need to consider how and whether or not rivals will respond to their prices. Monopolies’ profits depend only on the behaviour of consumers, their cost functions, and their prices or the amount supplied.¹¹⁶

Without regulation, the resulting market power would lead to high prices and probably insufficient investment. Accordingly, we must regulate the prices and other aspects of these services to ensure reliable and affordable electricity.¹¹⁷

Information asymmetries make it difficult for the AER to accurately assess the efficiency of the network businesses’ proposals. We need to make judgements about ‘efficient’ costs.¹¹⁸

Incentive regulation is used to partially overcome information asymmetries. We apply incentive-based regulation across all energy networks we regulate—consistent with the NER.¹¹⁹ This is a fundamental aspect of the regime. As stated by the AEMC:

Set out in Chapter 6 of the NER, the incentive regulation framework is designed to encourage distribution businesses to spend efficiently and to share the benefits of efficiency gains with consumers. Specifically, it is designed to encourage distribution businesses to make efficient decisions on when and what type of expenditure to incur in order to meet their network reliability, safety, security and quality requirements.¹²⁰

¹¹⁵ Productivity Commission, Electricity Network Regulatory Frameworks, inquiry report no. 62, 2013, p. 65.

¹¹⁶ ACCC, Submission to the Productivity Commission’s inquiry into the economic regulation of airport services, March 2011, p. 8.

¹¹⁷ Productivity Commission, Electricity Network Regulatory Frameworks, inquiry report no. 62, 2013, p. 65.

¹¹⁸ Productivity Commission, Electricity Network Regulatory Frameworks, inquiry report no. 62, 2013, p. 190.

¹¹⁹ Clause 6.2.6(a) of the NER states that for standard control services, the control mechanism must be of the prospective CPI minus X form, or some incentive-based variant of the prospective CPI minus X form, in accordance with Part C (Building Block Determinations for standard control services). Further, the RPPs state a regulated network service provider should be provided with effective incentives in order to promote economic efficiency with respect to direct control network services the operator provides.

¹²⁰ AEMC, Consultation paper: National Electricity Amendment (Demand Management Incentive Scheme) Rule 2015, February 2015, p. 3.

Broadly speaking, incentive regulation is designed to align the commercial goals of the business to the goals of society or, in the case of energy regulation, the NEO.¹²¹ It relies on the principle that the network businesses' objective is to maximise profits.¹²² Businesses that are able to improve their efficiency are rewarded with higher profits.¹²³ Businesses that allow their efficiency to deteriorate earn lower-than-expected profits. The actual revenue allowance set by the regulator should not influence the basic incentive of network businesses to minimise costs and, thereby, maximise profits.

To elaborate, the regime requires the AER to forecast and lock-in opex at the start of each five-year regulatory period that an efficient and prudent business would require.¹²⁴ The business is then given financial rewards when it improves its efficiency and spends less than the forecast during the regulatory period—while maintaining or improving its service standards. If the business spends less than the forecast it will still earn revenue to cover the total forecast amount. Hence it can 'keep the difference' between the forecast and its actual expenditure until the end of the regulatory control period. Conversely, if its spending exceeds the forecast, it must carry the difference itself until the end of the period.

Over time, incentive regulation should in theory allow the regulator to use the information revealed by businesses to develop better forecasts of efficient expenditure—consistent with the opex criteria. This will reduce the scope for the businesses to earn excessive rents and allow the regulator to apply stronger incentives for further cost reduction.¹²⁵

However, using a network business' past information to set future targets can reduce the incentives of the business to lower costs since the business knows that any cut in its expenditure will decrease its revenue allowance in the future. Although the current regulatory approach allows the business to retain the benefit of any reductions in expenditure for a period of time, setting the appropriate level of incentive is difficult as it involves judgments about businesses' reactions to the incentive regime.¹²⁶ Moreover, the achievement of best-practice can be costly from the standpoint of managerial effort.¹²⁷

¹²¹ Productivity Commission, Electricity Network Regulatory Frameworks, inquiry report no. 62, 2013, p. 188.

¹²² Put simply, it is assumed that shareholders want the business to maximise profits because the greater the profits, the greater their income.

¹²³ As stated by the AER in its Expenditure Forecast Assessment Guideline explanatory statement, 'the ex-ante incentive regime provides an incentive to improve efficiency (that is, by spending less than the AER's forecast) because network businesses can retain a portion of cost savings made during the regulatory control period.' (p. 42).

¹²⁴ This takes into account the realistic expectations of demand forecasts and cost inputs, to meet and manage the demand for network businesses' services, comply with their regulatory obligations and maintain the safety of the system.

¹²⁵ Productivity Commission, Electricity Network Regulatory Frameworks, inquiry report no. 62, 2013, p. 192.

¹²⁶ Productivity Commission, Electricity Network Regulatory Frameworks, inquiry report no. 62, 2013, p. 190.

¹²⁷ ACCC & Public Utility Research Centre University of Florida, Infrastructure regulation and market reform: Principles and practice, May 1998, p. 39.

Therefore, the incentives created by the regime can be somewhat mixed.¹²⁸ But, as a first principle, energy regulation in Australia is intended to be incentive-based where possible.¹²⁹ This can be contrasted with a pure cost of service model.

A.2.2 Contrast with a cost of service regime

Cost of service regulation, as its name implies, compensates businesses for the costs incurred to provide services. If a business reduces its costs, the benefits of cost efficiency accrue to consumers in the form of lower prices, not to the business as profits. On the other hand if costs increase then so do prices.

Cost of service regulation creates an environment that provides greater assurance to businesses that investments in sunk assets will be recovered. However, a pure cost of service approach provides low-powered incentives for cost reductions because actual costs are fully passed through to consumers. Joskow states:

Since the regulator compensates the firm for all of its costs, there is no “rent” left to the firm as excess profits. This solves the adverse selection problem. However, this kind of cost of service recovery mechanism does not provide any incentives for the management to exert optimal (any) effort. If the firm’s profitability is not sensitive to managerial effort, the managers will exert the minimum effort that they can get away with. While there are no “excess profits” left on the table since revenues are equal to the actual costs the firm incurs, consumers are now paying higher prices than they would have to pay if the firm were better managed and some rent were left with the firm and its managers.

¹³⁰

Such low-powered incentives created by a pure cost of service model are typically not observed in competitive markets. This is an important distinction between incentive and cost of service regulation.

In our view, the NEO and the supporting incentive-based regime seek to emulate workably competitive market outcomes. Incentive regulation is designed to impose the pressures of competition on natural monopolies. The AEMC states:

The role of incentives in regulation can be traced to the fundamental objective of regulation. That is, to reproduce, to the extent possible, the production and

¹²⁸ Joskow finds incentive-based regulation applies elements of cost of service regulation in practice: ‘This basic price-cap regulatory mechanism used to regulate electricity, gas and water distribution and transmission companies in the UK, is often contrasted with characterizations of cost-of-service or “cost plus” regulation that developed in the U.S. during the 20th century. However, I believe that there is less difference than may first meet the eye. The UK’s implementation of a price cap based regulatory framework is best characterized as a combination of cost-of-service regulation, the application of a high powered incentive scheme for operating costs for a fixed period of time, followed by a cost-contingent price ratchet to establish a new starting value for prices. (Joskow, Incentive regulation in theory and practice: electricity distribution and transmission networks, 2005, pp. 70–71.)

¹²⁹ AER, Overview of the Better Regulation reform package, April 2014, p. 4.

¹³⁰ Joskow, Incentive regulation in theory and practice: electricity distribution and transmission networks, 2005, pp. 10–11.

pricing outcomes that would occur in a workably competitive market in circumstances where the development of a competitive market is not economically feasible.¹³¹

Competition generally places downward pressure on prices and can act as an impetus for cost reductions and quality improvements. In a competitive market, businesses have a continuous incentive to respond to consumer needs at the lowest cost to increase demand for their services and, thereby, maximise shareholder returns.¹³² Businesses that are less efficient are unable to pass their full costs onto consumers and ultimately pay lower returns to their shareholders.

Consistent with competitive market outcomes, the AEMC considers shareholders, by seeking a commercial return on investment, create incentives within the business to encourage efficient outcomes.¹³³ Moreover, the AEMC finds that shareholders should ultimately bear the risk of business inefficiencies:

... the return on debt estimate should reflect the efficient financing costs of a benchmark efficient service provider. It should try to create an incentive for service providers to adopt efficient financing practices and minimise the risk of creating distortions in the service provider's investment decisions. If a service provider is run inefficiently then its shareholders, and not its customers, should bear the financial consequences of inefficient financing practices.¹³⁴

Although the AEMC is referring to return on debt in the above quote, the same principle applies to opex. Risk should generally be borne by the party that is best able to manage it. Consumers of network energy services are not in a position to influence the network businesses strategy to manage opex, such as staffing decisions. And they do not have the choice of changing energy suppliers. Shifting the risk of business inefficiencies away from the managers and shareholders of the networks would create negative incentives:

It is also in present and future consumers' interests that the regulatory framework does not provide excess returns, reward inefficiency or effectively 'bail out' a network company that has encountered financial difficulty as a result of its own actions (or inaction); for example because of an inappropriate financial structure or poor management. To do so would weaken or even remove the disciplines that capital markets place on all companies, reducing or removing the effectiveness of the incentives we place on network companies under the regulatory regime to the detriment of consumers. The primary

¹³¹ AEMC, Rule Determination: National Electricity Amendment (Economic Regulation of Transmission Services) Rule 2006 no. 18, November 2006, p. 93.

¹³² ACCC, Submission to the Productivity Commission's inquiry into the economic regulation of airport services, March 2011, pp. 8–9.

¹³³ AEMC, Rule Determination: Economic Regulation of Network Service Providers, November 2012, p. 34.

¹³⁴ AEMC, Rule Determination: Economic Regulation of Network Service Providers, November 2012, p. 73.

responsibility for the financial integrity of a network company lies firmly with that company's management and owners.¹³⁵

A.2.3 How benchmarking helps manage incomplete information about efficient costs

Incentive regulation relies on effective assessment tools to overcome information asymmetries. The 'revealed cost approach' and benchmarking are our two main tools.

As outlined in the Guideline, the AER typically uses the 'base-step-trend' forecasting approach to assess most opex categories. That is, we:

- assess whether base opex reasonably reflects the opex criteria
- assess the prudence and efficiency of forecast cost increases or decreases associated with new regulatory obligations and capex/opex trade-offs (step changes)
- apply trend analysis to forecast future expenditure levels.¹³⁶

The revealed cost approach is a way to determine an efficient base. It relies on the principle that the primary objective of a business is to maximise its profits. The regulatory framework allows network businesses to keep the benefit of any cost reductions for a period of time (as discussed above). The AER may apply various incentive schemes, such as the EBSS in conjunction with the STPIS, to provide the business with a continuous incentive to improve its efficiency in supplying electricity services—while maintaining or improving service standards.

The drive to maximise shareholder returns should in theory push the businesses to become more efficient and productive over time. Actual past expenditure should therefore be a good indicator of the efficient expenditure the business requires in the future.

So, where incentive regulation is effective, the revealed cost approach can at least partially overcome information asymmetries that exist between the business and relevant stakeholders about the efficient opex base. We prefer to use revealed (past actual) costs as the starting point for assessing and determining efficient forecasts.¹³⁷ It allows us to leave the minutiae of input and output decision-making to the businesses.¹³⁸

¹³⁵ Ofgem, *Regulating Energy Networks for the Future: RPI-X@20: Emerging Thinking – Embedding financeability in a new regulatory framework*, Parallel consultation paper, 20 January 2010, p. 4.

¹³⁶ AER, *Expenditure Forecast Assessment Guideline for Electricity Distribution*, 2013, pp. 22–24.

¹³⁷ AER, *Expenditure Forecast Assessment Guideline explanatory statement*, 2013, p. 42.

¹³⁸ Productivity Commission, *Electricity Network Regulatory Frameworks*, inquiry report no. 62, 2013, pp. 27–28.

However, we cannot automatically assume the network businesses will respond to the efficiency incentives.¹³⁹ The businesses' objectives may not align with the incentives of the regime.¹⁴⁰ We undertake an assessment of whether the base year opex reasonably reflects the opex criteria to determine if it is appropriate for us to rely on a business' revealed costs to forecast future expenditure needs.

In recent years, we have expanded our regulatory toolkit to make greater use of benchmarking, which is a way of determining how well a network business is performing against its peers and over time, and provides valuable information on what is 'best practice' (see Box 1). Benchmarking:

- improves the effectiveness of the regulatory process by enhancing the information available to us
- gives us an alternative source of comparative information about the costs of operating a business in the national electricity market to test the businesses' proposals
- allows us to gain some insight into whether or not there are material inefficiencies in a business' base opex and, therefore, represent a good basis for forecasting future opex.

We use benchmarking to investigate whether an adjustment to base opex is required—that is, we look for evidence of 'material inefficiencies' in a network business' base opex. If the business is materially inefficient compared to its peers, the revealed cost approach may not be appropriate.¹⁴¹ Reliance on historic costs in these circumstances could yield an outcome inconsistent with the opex criteria and, more broadly, the NEO and RPPs which give effect to incentive regulation.

¹³⁹ The NER require us to be satisfied that a business' total opex forecast reasonably reflects the expenditure criteria (NER, cl. 6.5(c)). Further, we must consider the actual and expected expenditure of the service provider during preceding regulatory control periods, and whether expenditure is consistent with our incentive schemes (NER, cl. 6.5.6(e)(5) and (8)).

¹⁴⁰ ACCC & Public Utility Research Centre University of Florida, Infrastructure regulation and market reform: Principles and practice, May 1998, p. 39.

¹⁴¹ AER, Expenditure Forecast Assessment Guideline explanatory statement, 2013, p. 93.

Box 1 AER benchmarking techniques

Benchmarking is just one way of assessing whether a business' expenditure proposal is efficient.¹⁴² We use multiple benchmarking techniques to inform our assessment of efficient opex. This includes 'economic benchmarking', partial performance indicators and category-based techniques. In addition, we undertake detailed reviews to investigate the drivers of, or potential explanations for, high expenditure indicators.

Specifically, our consultant, Economic Insights used a stochastic frontier analysis (SFA) model to estimate efficient base year opex and calculate the trend in opex going forward. Economic Insights used two other econometric models as well as multilateral total factor productivity (MTFP) and multilateral partial factor productivity (MPFP) indexes to cross-check the findings of the SFA model. Further, Economic Insights used international data to improve the robustness and precision of the models, but not to benchmark Australian networks against those operating overseas.

Stochastic frontier analysis

SFA is an extended econometric method that can be used in cost benchmarking analysis. SFA enables the estimation of a cost frontier, from which actual costs incurred by businesses can be compared. SFA is similar to other econometric cost models in that it specifies a cost function that relates costs to outputs, input prices, and environmental factors.

However, it differs from traditional econometric approaches in two main ways. First, SFA focuses on estimating the cost frontier representing the minimum costs ('best practice') rather than estimating the cost function representing the 'average' business. Second, SFA aims to separate the presence of random statistical noise from the estimation of inefficiency. SFA also has the advantage that it allows for economies and diseconomies of scale and can include environmental factors.

A.2.4 Benchmarking is part of the regulatory framework

The NER has always required us to have regard to benchmark opex that would be incurred by an efficient network business (cl. 6.5.6(e)(4)). The AEMC's November 2012 network regulation rule changes promote the AER's use of benchmarking for assessing and determining opex forecasts. The new NER stipulate that the AER will undertake and publish regular benchmarking reports, and that we must have regard to these reports in assessing whether networks' proposed opex forecasts reasonably reflect the opex criteria. Further, the AEMC removed potential constraints in the NER on the way the AER may use benchmarking.¹⁴³

Benchmarking promotes the revenue and pricing principles (RPPs), which we are required to take into account when making our decisions. The principles include that a service provider should be provided with: (1) a reasonable opportunity to recover at

¹⁴² Productivity Commission, Electricity Network Regulatory Frameworks, inquiry report no. 62, 2013, p. 27.

¹⁴³ AEMC, Rule Determination: Economic Regulation of Network Service Providers, November 2012.

least its efficient costs; and (2) effective incentives to promote economic efficiency in the provision of its direct control services.

First, benchmarking allows us to more accurately assess whether networks' proposed opex forecasts are efficient. It gives us an additional source of evidence about the networks' performance. Indeed, the AEMC considered that benchmarking is a critical exercise in assessing the efficient costs of a network business and approving its opex forecast.¹⁴⁴

Our use of benchmarking may mean we forecast a business' future opex requirements at a lower level compared to its historical costs to reflect the opex criteria. A prudent operator would not discount the possibility that we could better detect inefficient costs over time. Each network knows that their revenue allowance may be reduced if it is shown that other networks are operating more efficiently.

The revenue allowance determined by the AER does not set a business' actual operating budget. We predict the operating expenditure required for each network business acting as a prudent operator, incurring efficient costs. The business should attempt to outperform it. The business is expected to organise itself efficiently to make the most efficient use of its resources.¹⁴⁵ Management should attempt to minimise costs in an effort to maximise shareholder value.

That is, a prudent operator is expected to respond to the incentives of the regime—consistent with the NEO and competitive market outcomes.¹⁴⁶ The incentive regime is designed to provide the impetus for the business to deliver safe, reliable and secure services to its customers.

Second, energy regulation in Australia is intended to be incentive-based where possible. Benchmarking strengthens incentives for network businesses to minimise costs—it creates effective incentives to promote: efficient investment, the efficient provision of services and the efficient use of the distribution system, consistent with the NEO.

Benchmarking creates a form of competitive pressure on the networks, whereby information about the relative performance of a business can be an important incentive for improvement.¹⁴⁷ Benchmarking is widely used by private sector firms to identify opportunities for operational efficiencies and other improvements.

¹⁴⁴ AEMC, Rule Determination: Economic Regulation of Network Service Providers, November 2012, p. 112.

¹⁴⁵ Productivity Commission, Electricity Network Regulatory Frameworks, inquiry report no. 62, 2013, pp. 170–171.

¹⁴⁶ In a competitive market environment, various forces keep managers from deviating from profit-maximising objectives behaviour. If a competitive business is run inefficiently and unprofitably, it could be driven out of business or taken over by rivals/new entrants that do maximise profits. Managers who lose their jobs in these circumstances can find it difficult to obtain new jobs. Incentives such as stock ownership and other performance bonuses also motivate managers to maximise profits.

¹⁴⁷ AER, Expenditure Forecast Assessment Guideline explanatory statement, 2013, p. 42.

A.2.5 Benchmarking is a common regulatory tool

The use of benchmarking in economic regulation of energy networks is well-established. The AER/ACCC undertook two studies in 2012 on how benchmarking is applied around the world. These studies cover the key methods, relevant literature and regulatory practices, as well as the major technical and implementation issues in benchmarking energy networks.¹⁴⁸¹⁴⁹ The studies carefully list the advantages and disadvantages of each benchmarking method in the context of energy network regulation. We also commissioned a thorough analysis of benchmarking approaches in some European countries.¹⁵⁰

The Productivity Commission found utility regulators around the world use static (and dynamic) benchmarking to encourage regulated businesses to achieve the long-run efficiency outcomes of decentralised, workably competitive, markets.¹⁵¹ Benchmarking has been used by:

- Australian regulators, including state based electricity regulators and the AER
- international regulators such as OFGEM (United Kingdom), CER (Ireland), NZCC (New Zealand), and OEB (Ontario Canada)
- various academics in the Australian, European, American and other contexts.¹⁵²

Unlike some industries, electricity network distribution businesses are good candidates for benchmarking opex. All network businesses use a similar set of assets, such as poles, wires, transformers and cables, to provide network services to customers. Indeed, Bain & Company states '... in some ways, utilities are one of the most straightforward industries to benchmark because they perform essentially the same tasks wherever they are.'¹⁵³

This commonality means that economic benchmarking of costs can be used to measure the economic efficiency of a network business by comparing its performance not only to other businesses, but also to its own past performance.¹⁵⁴ Historically, electricity distribution has exhibited low technology change in comparison to, for example, communications where the pace of technology change is more dynamic.¹⁵⁵

However, it is important to recognise that network businesses do not operate under exactly the same operating environment conditions. Further, distribution businesses

¹⁴⁸ ACCC/AER, Benchmarking Opex and Capex in Energy Networks, ACCC/AER Working Paper no. 6, May 2012.

¹⁴⁹ ACCC/AER, Regulatory Practices in Other Countries: Benchmarking Opex and Capex in Energy Networks, May 2012.

¹⁵⁰ Schweinsberg, Stronzik, and Wissner, Cost Benchmarking in Energy Regulation in European Countries, Wik Consult, December 2011.

¹⁵¹ Productivity Commission, Electricity Network Regulatory Frameworks, inquiry report no. 62, 2013, p. 148.

¹⁵² Productivity Commission, Electricity Network Regulatory Frameworks, inquiry report no. 62, 2013, p. 148.

¹⁵³ Bain & Company, Sustained cost reduction for utilities, 2013, p. 2.

¹⁵⁴ AER, Expenditure Forecast Assessment Guideline explanatory statement, 2013, p. 132.

¹⁵⁵ Coelli, Estache, Perelman, Trujillo, A Primer on Efficiency Measurement for Utilities and Transport Regulators, 2003, p. 11.

can vary in the scope of electricity distribution services they provide. Benchmarking needs to properly account for these differences so that when comparisons are made across networks, we are comparing 'like-with-like' to the greatest extent possible.¹⁵⁶ As stated by the AEMC:

... when undertaking a benchmarking exercise, circumstances exogenous to a NSP should generally be taken into account, and endogenous circumstances should generally not be considered. In respect of each NSP, the AER must exercise its judgement as to the circumstances which should or should not be included.

...

If there are some exogenous factors that the AER has difficulty taking adequate account of when undertaking benchmarking, then the use to which it puts the results and the weight it attaches the results can reflect the confidence it has in the robustness of its analysis.

Our benchmarking models account for key differences in operating environment factors (section A.6). This is followed by our review of a large set of operating environment factors to determine whether it is necessary to provide further allowance for operating environment differences.

We undertook an extensive research and consultation process to develop the benchmarking used in the annual benchmarking report and in the determinations. This has been in conjunction with Economic Insights, which is an internationally recognised expert consultant on benchmarking. As discussed in section A.3, we released a significant benchmarking study in 2012 and consulted heavily on both the Guideline (including through an issues paper, draft guideline and workshops) and regulatory information notices. We have further developed our benchmarking models through this determination process.

¹⁵⁶ AER, Expenditure Forecast Assessment Guideline explanatory statement, 2013, p. 132.

A.3 Assessment approach

In section 7.3, we presented a diagram explaining the five steps in our approach to assessing a service provider's total forecast opex.

This section explains our approach to assessing base opex, which covers Step 1 and Step 2 of this overall approach.

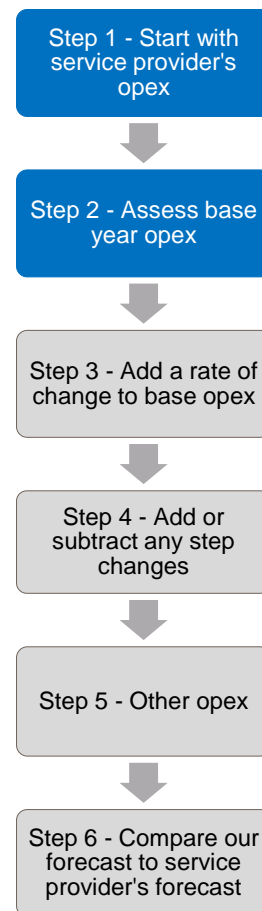
Assessing base opex is a crucial part of our overall assessment approach because it is the foundation upon which we build our own estimate of total forecast opex that we consider reasonably reflects the opex criteria. We use our estimate to:

- determine whether to either accept or not accept a service provider's total forecast opex proposal by reference to the opex criteria,¹⁵⁷ and
- in the event we must reject a service provider's proposal¹⁵⁸ (that is, if it does not reasonably reflect the opex criteria) replace that proposed forecast.

The starting point for developing our estimate is the service provider's revealed costs (in this case, opex for the 2012–13 financial year). This is base opex, represented by Step 1, above. Base opex has been audited, and is used by ActewAGL as an agreed starting point.¹⁵⁹

As foreshadowed in the Guideline¹⁶⁰, we use the following techniques to assess whether the base opex is suitable as a starting point for determining an estimate of total forecast opex that reasonably reflects the opex criteria (represented by Step 2, above):

- economic benchmarking—more complex techniques that use applies economic theory to measure the efficiency of a distributor's use of inputs to produce a number of different outputs, having regard to operating environment factors
- partial performance indicators—simplistic techniques that relate total opex and total user cost to one cost driver, such as line length or customer density (known as aggregated category benchmarks in the Guideline)



¹⁵⁷ NER 6.5.6(c), considered in more detail below.

¹⁵⁸ NER 6.5.6(d), considered in more detail below.

¹⁵⁹ ActewAGL, Regulatory proposal, 2014, p. 223.

¹⁶⁰ AER, Expenditure forecast assessment guideline, November 2013, p. 22.

- category analysis—that compares, across service providers, the cost of delivering a particular category of opex (such as maintenance, vegetation management, etc.) to identify areas for detailed review
- detailed review—targeted, qualitative, examination of particular categories of expenditure, such as labour costs and vegetation management, conducted with the assistance of industry experts.

Benchmarking is particularly important in Step 2 of our approach because it enables us to compare the relative efficiency of the total opex of different service providers.¹⁶¹ The NER give us discretion as to how we use benchmarking in our assessment.¹⁶²

As part of our application of economic benchmarking, we consider differences in service providers' operating environments that could account for some differences in the relative efficiency scores. Based on this review we make appropriate adjustments to efficiency scores.

We have a preferred benchmarking model, which is Cobb Douglas stochastic frontier analysis (SFA).¹⁶³ This model creates an efficiency score for all service providers in the NEM. In the event we make an adjustment to base opex, we use this model as the starting point.

If a service provider performs well on our economic benchmarking techniques, we consider it is unnecessary for us to review base opex in further detail. No adjustment is required because we consider the service provider's base opex is not materially inefficient and, therefore, an appropriate starting point for our estimate of total forecast opex that reasonably reflects the opex criteria. Conversely, if our economic benchmarking techniques indicate that a service provider's opex is not efficient, we then review base opex in further detail and consider whether it is necessary to adjust base opex.

Theoretically, all service providers who rank below the service provider with the highest efficiency score on our preferred technique could be considered inefficient. If we decided to apply benchmarking deterministically, we could simply determine the degree of a service provider's inefficiency against the efficiency score of the most efficient service provider and adjust their opex accordingly.

However, we are not applying benchmarking deterministically. As we demonstrate in the diagram below, we have regard to a number of sources of evidence in forming a view on base opex efficiency, consistent with the approach we outlined in the Guideline. If it is clear that base opex is inefficient, we depart from revealed costs. When we do so, we rely on the most robust benchmarking model as the basis for adjustment.

¹⁶¹ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, p. 97.

¹⁶² AEMC, Final Rule Determination, 29 November 2012, pp. 112–113.

¹⁶³ Economic Insights, 2014, p. iv.

In doing so, however, we rely on the concept of material inefficiency introduced in the Guideline. Because our preference (as stated in the Guideline) is to rely on the revealed cost approach to determine the starting point for our estimate of total forecast opex, we depart from revealed costs only when we consider base opex is *materially* inefficient.¹⁶⁴ The concept of material efficiency recognises that efficiency is a relative term, and one which properly does not adjust a service provider's revealed costs for immaterial inefficiency.

Therefore, in deciding what is materially inefficient, we consider it is appropriate to provide a margin for the effect of potential modelling and data limitations. To give effect to this consideration, we do not compare service providers to the frontier business. We consider the appropriate "benchmark comparison point" is the lowest of the efficiency scores for service providers in the top quartile of possible scores on our preferred SFA model. This is equivalent to the efficiency score for the business at the bottom of the upper third (top 33 per cent) of companies in the benchmark sample (represented by AusNet Services).¹⁶⁵ Our approach of using benchmarking as a basis for making adjustments to opex is consistent with Ofgem's approach.¹⁶⁶

This means that we will not adjust the base year opex of a service provider unless its efficiency score (taking into account operating environment factors) is below the service provider with the lowest of the efficiency scores in the top quartile of possible scores. We have done this because:

- given it is our first application of benchmarking, it is appropriate to adopt a cautious approach, allowing a margin for potential modelling and data issues and other uncertainties

Step 2
Assess base year opex

Step 2a
Using several sources of evidence, form a view about the efficiency of base opex:

- Economic benchmarking techniques, adjusted for operating environment factors
- Detailed reviews
- Partial performance indicators
- Category analysis

Step 2b
Determine the appropriate adjustment using the most robust benchmarking technique (SFA) and a benchmark comparison point that reflects 'materially inefficient' rather than the efficient frontier

¹⁶⁴ AER, Expenditure forecast assessment guideline, November 2013, p. 32–33.

¹⁶⁵ This approach is a departure from our draft decision approach to determining the benchmark comparison point. We discuss this further in section A.7.

¹⁶⁶ Noting that Ofgem now assesses total expenditure rather than capex and opex separately. See, for example, Ofgem, RIIO-ED1–Final determinations for the slow-track electricity distribution companies-Overview, 28 November 2014, Chapter 4.

- we consider this approach is consistent with the NEO and RPP because it is sufficiently conservative to avoid the risks associated with undercompensating the service provider but also promotes efficiency incentives.

This has the effect of significantly reducing the target against which we compare and (if necessary) adjust service providers' base opex. Our detailed consideration of adjustments to base opex is set out in section A.7.

A.3.1 Our approach to benchmarking since May 2012

We released a working paper on benchmarking in May 2012, and commenced work on the Guideline in December 2012, following the November 2012 Rule change. We finalised the Guideline in November 2013. We subsequently engaged in an extensive process of information gathering that culminated in our first Annual Benchmarking Report in November 2014. Service providers and any other interested parties have had access to the benchmarking RIN data since we published it on our website in May 2014. For the past three years, we have consulted widely with service providers and other stakeholders on our approach and its legal and economic underpinnings. Stakeholders also participated in the rule change process. Table A.2 (further below) sets out this consultation process.

We have, therefore, consulted widely with stakeholders regarding our approach to assessing expenditure forecasts. These consultations have included discussions on how we should use benchmarking in our analysis. During this process, some service providers raised concerns similar to those filed in their responses to our draft decisions. These include submissions that:

- our approach is inconsistent with the NEL and NER
- we have placed excessive weight on benchmarking in our approach¹⁶⁷
- we must give primacy to service provider's regulatory proposals in assessing or determining an opex forecast
- we are required to (and have not) had regard to the service providers' individual circumstances
- our benchmarking approach is flawed
- our approach ignores the constraints and obligations the distributors face so the result is unrealistic.

Some service providers have also raised additional issues subsequent to the consultation process, the RINs, our annual benchmarking report and the draft decisions.¹⁶⁸ This includes material prepared as early as 2012 which was,

¹⁶⁷ For example. Huegin Consulting, Submission on the AER Expenditure Guidelines: A Review of the Benchmarking Techniques Proposed, 20 September 2013, p. 10 and p. 13.

¹⁶⁸ For example, in the explanatory statement to our expenditure forecast assessment guideline, we ask no less than 24 questions on economic benchmarking. In their submission on the explanatory statement the NSW distributors

unfortunately, not provided to us by service providers until after we had published our draft decisions.¹⁶⁹ Issues raised in this material include:

- the sensitivity of data envelopment analysis to input and output specifications and sample size
- there is additional benchmarking data and variables that should be considered by us in making our assessments.

We acknowledge that many aspects of our decision making relate to forward looking, technical and difficult matters, on which reasonable minds can differ. However, it is important to distinguish different decisions which we potentially could have made in exercising our discretion from a substantive reason why our decision is or would be unreasonable or incorrect. As the Tribunal has noted:¹⁷⁰

It is axiomatic that there will be no one correct or best figure derived from a forecast that in terms of cl 6.5.6(c) 'reasonably reflects' the opex criteria – the very nature of forecasting means that there can be no one absolute or perfect figure. Different forecasting methods are more likely than not to produce different results. Simply because there is a range of forecasts and a distributor's forecast falls within the range does not mean it must be accepted when, as here, the AER has sound reason for rejecting the forecast.

We have had careful regard to the new submissions and concerns raised by service providers. We encourage all stakeholders to actively, transparently and cooperatively participate in our consultation processes as that assists all stakeholders in delivering the best outcomes in accordance with the legislative framework.

A.3.2 How our approach is consistent with NER requirements

We consider that our assessment approach is consistent with the requirements of the NER. That is, we consider that our approach to assessing and, if required, substituting a service provider's proposal is consistent with:

- the opex criteria¹⁷¹
- the opex objectives
- the opex factors
- the revenue and pricing principles.

did not address any of these questions despite having multiple reports that were relevant. AER, Better Regulation, Expenditure forecast assessment guidelines for electricity distribution and transmission, Issues paper, December 2012, pp 88–91.

¹⁶⁹ For example: Evans & Peck, Review of factors contributing to variations in operating and capital costs structures of Australia distributors, Final Report, November 2012; Huegin Consulting, Distribution benchmarking study, 2012.

¹⁷⁰ Application by Ergon Energy Corporation Limited (Labour Cost Escalators) (No 3) [2010] ACompT 11 at [69].

¹⁷¹ The opex criteria broadly reflect the NEO as noted by the AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, p. 113.

Fundamentally, we consider that our decision is likely to contribute to the achievement of the NEO by incentivising and funding efficient, prudent and realistic expenditures. We take this view because our approach:

- ensures that the opex forecast reasonably reflects the efficient costs a prudent service provider requires to safely and reliably provide electricity services; and
- encourages service providers to efficiently invest and operate electricity services, by ensuring that service providers (and not consumers) bear the cost of expenditure in excess of prudent and efficient levels.¹⁷²

Incentives can only be effective if the service providers, rather than consumers, bear the burden of funding spending that does not reasonably reflect the opex criteria.

Opex criteria

The opex criteria in clause 6.5.6(c) of the NER require the AER to assess a service provider's proposal to decide whether it reasonably reflects:

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

We consider that the opex criteria work together as a single overall requirement.¹⁷³ Prudence and efficiency are complementary.¹⁷⁴ The Australian Competition Tribunal refers to them as a unified concept, and has described them as a single "prudent and efficient requirement".¹⁷⁵

In turn, "prudent and efficient" costs can only be sensibly given meaning by reference to the demand forecast for the services the service provider provides and the realistic cost inputs that a prudent and efficient provider would require to achieve its opex objectives. When we refer to prudent and efficient costs, we mean costs that a prudent and efficient provider would require, having regard to realistic expectations of cost inputs and the demand forecast to achieve its objectives.

¹⁷³ The Tribunal has applied the term in this fashion in at least the following matters: Application by Ergon Energy Corporation Limited (Non-system property capital expenditure) (No 4) [2010] ACompT 12; Application by EnergyAustralia and Others [2009] ACompT 8; Application by Ergon Energy Corporation Limited (Labour Cost Escalators) (No 3) [2010] ACompT 11; Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14; Application by United Energy Distribution Pty Limited [2012] ACompT 1; Re: Application by ElectraNet Pty Limited (No 3) [2008] ACompT 3; Application by DBNGP (WA) Transmission Pty Ltd [2012] ACompT 6.

¹⁷⁴ AEMC, Draft rule determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, p 76.

¹⁷⁵ Application by ElectraNet Pty Limited (No 3) [2008] ACompT 3 at 199; ¹⁷⁵ Application by EnergyAustralia and Others [2009] ACompT 8 at 141, citing reports prepared by service providers and the NER from 2008.

Importantly, the demand forecast and cost inputs are for those of a prudent and efficient service provider operating that network. They are not the cost inputs which result from previous inefficient decision making. This does not mean that we do not take account of circumstances or factors which are beyond the control of a service provider when making our assessment.

It is inherent in the opex criteria, each criterion being concerned with the costs of achieving the opex objectives, that we must have regard to an objective prudent and efficient service provider. However, in doing so, we must also have regard to the differing exogenous circumstances of the service provider we are assessing when making our decisions. This includes costs that arise due to the individual circumstances affecting the manner in which the service provider operates, but over which it does not have control. Such circumstances include geographic factors, customer factors, network factors and jurisdictional factors.¹⁷⁶

However, the costs that reasonably reflect the opex criteria do not include costs that result from prior inefficient or imprudent spending. These costs may relate to the quality of management or financial decisions. Such factors are within a service provider's control and are inconsistent with costs that a prudent and efficient service provider would incur. This remains the case where a service provider has used revenue recovered by consumers in previous regulatory periods, consistent with our previous decisions, to make such decisions. This view is consistent with the incentive based aims of the regulatory scheme when read as a whole.

It is also consistent with the rationale provided by the AEMC for removing the phrase "individual circumstances" from the opex criteria.¹⁷⁷ Accordingly, we disagree with an interpretation of the opex criteria that a forecast which reflects a "realistic expectation of cost inputs" must take account of past discretionary decisions made by a service provider that bind the service provider, but do not reflect the efficient costs that an objectively prudent operator would incur. This is the case even if, as discussed below, those costs are contractually fixed.

Our approach also satisfies the requirement in the opex criteria that we determine a *total* forecast opex.¹⁷⁸ We are not required to assess individual projects or components of a forecast because such an approach would de-incentivise efficient and prudent discretionary spending and would effectively result in a cost of service regime.¹⁷⁹

The total forecast opex is forward looking and directed towards the requirements of an objectively efficient and prudent operator in the future, which will then be funded by consumers through the building block revenue model established under the NER.

¹⁷⁶ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, p. 113. See also pp. viii, 25, 98, 107-108.

¹⁷⁷ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp 107, 113.

¹⁷⁸ NER 6.5.6(a).

¹⁷⁹ AEMC, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012 No.9 at 93.

We must estimate a total forecast which we are satisfied *reasonably reflects* the opex criteria. We use this estimate as a comparator for the service provider's proposal and as a substitute if required. As the AEMC and the Tribunal have identified, the NER gives us broad discretion in how we perform this task.¹⁸⁰

In this context, we take the view that the opex criteria should be understood as applying an objective test—albeit a test that applies to a particular network and must therefore incorporate certain individual circumstances of that network. The intention behind the regulatory regime is to determine an objective forecast for the operating costs of the network that should be funded by consumers. If a service provider can better this forecast in its actual spending it is rewarded with the cost savings. If it overspends the forecast it bears the costs.

We therefore consider that an appropriate application of the opex criteria involves us making an assessment about what objectively would be:

- the efficient costs of achieving the opex objectives, rather than the actual costs a service provider has spent or intends to spend
- the costs that a prudent service provider for that network would require (rather than the actual costs the actual service provider in question intends or is contractually obliged to provide given all their circumstances and past decision making)
- a realistic expectation of the demand forecast (rather than the service provider's own demand forecast) and
- a realistic expectation of the cost inputs to achieve the objectives (not the actual cost inputs that the provider might incur, or have committed itself to spend money on, to achieve the opex objectives).

It follows, as the Tribunal has noted, there is unlikely ever to be one unique "correct" total forecast. Reasonable minds may differ as to the data and techniques.¹⁸¹ The AEMC has also recognised this.¹⁸² We expect and observe service providers and their consultants to disagree with aspects of our decision.

Opex objectives

Our assessment approach ascertains the total forecast opex for a prudent and efficient service provider, informed by a realistic expectation of the demand forecast and cost inputs, to achieve the opex objectives. One of these objectives is the applicable 'regulatory obligations or requirements' that the service provider must meet that are associated with the provision of standard control services.¹⁸³ Service providers are also

¹⁸⁰ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp 165.

¹⁸¹ Application by Envestra Limited (No 2) [2012] ACompT 3 at [146], approved of in Application by APA GasNet Australia (Operations) Pty Limited (No 2) [2013] ACompT 8 at [232].

¹⁸² AEMC, Economic Regulation of Transmission Services, Rule Determination, 16 November 2006 at 50, 52, 53.

¹⁸³ NER 6.5.6(1).

expected to comply with regulatory obligations under the RPP in the NEL.¹⁸⁴ The other opex objectives relate to safety, demand and, to the extent they are not regulatory obligations, reliability and security levels. We discuss the service providers' concerns with safety and reliability separately in section 7.5.

In acting to fulfil the opex objectives and having regard to the RPP, we therefore have close regard to the definition of 'regulatory obligation or requirement' in the NEL.¹⁸⁵ This definition is exhaustive. That is, only matters within the terms of the definition constitute 'regulatory obligations or requirements'.

To fall within the NEL definition, a regulatory obligation or requirement must be attributable to one of the following categories:

- distribution system safety duties
- distribution reliability standards
- distribution service standards
- obligations under the NEL, NER, NERL and NERR
- obligations under legislation in a participating jurisdiction levying tax, regulating the use of land or protecting the environment
- an Act or instrument of a participating jurisdiction that materially affects the provision of electricity network services.

A participating jurisdiction is defined as a jurisdiction which has, in force, a version of the NEL.¹⁸⁶

Accordingly, it is clear that the definition of 'regulatory obligations or requirements' is limited in application.¹⁸⁷ We have assessed claims by service providers in a manner consistent with this definition and our draft decision. Because this definition in the NEL is limited to the matters set out above, we do not consider that the following constitute 'regulatory obligations or requirements' as defined in the NEL:¹⁸⁸

- obligations at common law, tort and contract (such as common law duties of care in negligence)
- obligations to comply with legislation that is not from a participating jurisdiction
- obligations to comply with legislation that is from a participating jurisdiction, but which does not fall into the categories identified in the definition in the NEL.

¹⁸⁴ NEL 7A(2)(b).

¹⁸⁵ NER chapter 10, definition of 'regulatory obligation or requirement' and NEL, s2D.

¹⁸⁶ NEL s 5. This means that only jurisdictions which have passed a version of the NEL are participating jurisdictions.

¹⁸⁷ See Second reading speech, National Electricity (South Australia) (NEL -Miscellaneous Amendments) Bill 1996, p 6.

¹⁸⁸ Although these obligations may be informed by other requirements that do meet the definition.

For example, all legal persons (including corporations such as service providers) are required to comply with the requirements of the Australian Consumer Law.¹⁸⁹ These requirements are imposed by participating jurisdictions as well as by the Commonwealth. However, they do not fall into the NEL definition outlined above.

We therefore disagree with submissions which assert that a variety of requirements are 'regulatory obligations or requirements' under the NEL. For example, 'laws of general application to corporations and individuals, such as the Competition and Consumer Act, Corporations Act, Privacy Act, intellectual property legislation or motor traffic legislation'¹⁹⁰ are not 'regulatory obligations or requirements'.

It is unclear whether or not these submissions consider obligations to comply with laws of general application fall within the categories defined in the NEL. Regardless, for the reasons set out above, we do not consider that any of these obligations are a 'regulatory obligation or requirement' within the meaning of section 2D (and, by extension, section 5) of the NEL.

We also disagree with the service providers' submissions that compliance with the terms of their own EBAs¹⁹¹ is a 'regulatory obligation or requirement'. For example, service providers have referred to redundancy costs 'required to be paid as a regulatory obligation'.¹⁹²

First, of the six possible (and exhaustive) categories of obligations or requirements mentioned above, EBAs could conceivably only fall with an Act or instrument made or issued that 'materially affects a service provider's provision of electricity network services'. This is because the terms of an EBA could plausibly materially affect a service provider's provision of standard control services. However, that Act or instrument must be made by a 'participating jurisdiction'. Given a participating jurisdiction must have passed a version of the NEL, an EBA made under the Commonwealth's *Fair Work Act 2009* appears to be imposed by a law other than of a participating jurisdiction.¹⁹³ Further, the terms of an EBA itself are not contained in the *Fair Work Act 2009*.

Second, the consequences of breaching the *Fair Work Act 2009* are a separate and narrower subset of the potential consequences of a distributor breaching its EBA.

¹⁸⁹ Schedule 2 to the Competition and Consumer Act 2010 (Cth), various equivalents in state legislation identical terms.

¹⁹⁰ ActewAGL Revised proposal at 2, 4.

¹⁹¹ Pursuant to the *Fair Work Act 2009* (Cth).

¹⁹² Essential Energy, Revised Regulatory Proposal, p. 7; also implied by ActewAGL, Revised Regulatory Proposal, p. 68.

¹⁹³ The Commonwealth has not passed a version of the NEL so it is not a participating jurisdiction for the purposes of section 5 (and hence, section 2D) of the NEL. Commonwealth laws are 'regulatory obligations or requirements' if they fall within section 2D(1)(a). These relate to safety duties, reliability and service standards. However, commonwealth laws that fall within section 2D(1)(b), insofar as it refers to a 'participating jurisdiction', do not.

Third, we consider that the interpretation advocated by submissions is contrary to the requirement in clause 6.5.6(a) for a proposal to include the total forecast opex for a regulatory control period. It is important to note that when we determine total forecast opex, we do so within an overall incentive framework that requires the service provider to decide how to spend its allowed revenue requirement. As we mention above, a requirement that we consider the terms of EBAs when forming a view on total forecast opex would be more akin to a cost of service regime than an incentive regime.

Fourth, we note that while contractual or other obligations which do not fall within the definition are not regulatory obligations or requirements so defined, a service provider can still direct the revenue it recovers from customers (or from other sources) to comply with such obligations. The costs of compliance with obligations that are not within the definition of 'regulatory obligation or requirement' are treated like any other costs a service provider incurs.

Service providers have broad discretion about the contractual arrangements they enter into, and often have discretion about the manner in which they carry out their legal obligations. This discretion often includes whether to enter into particular legal obligations, such as employment contracts or arrangements with contractors.

We do not seek to interfere in the discretion a service provider has as to how and when to spend its total opex forecast to run its network. The service provider is free to decide how to manage its activities in light of the revenue recovered from consumers that we approve. Equally, the service provider bears the consequence of imprudent or inefficient decisions, including those relating to cost inputs or its response to demand forecasts. When a service provider enters into an agreement of any kind, it does so in the full knowledge that the forecast will apply for five years, without any guarantee that the same or a similar forecast will be approved for the following five year period.

As the AEMC notes, this underpins the incentive properties of the regulatory regime:¹⁹⁴

The level, rather than the specific contents, of the approved expenditure allowances underpin the incentive properties of the regulatory regime in the NEM. That is, once a level of expenditure is set, it is locked in for a period of time, and it is up to the NSP to carry out its functions as it sees fit, subject to any service standards.

Accordingly, where a service provider has entered into an EBA which requires it to incur expenditure that, objectively, would be viewed as inefficient or imprudent or involving cost inputs that an objectively prudent provider would not be realistically expected to incur, it is for the service provider to bear the costs of its decisions.

Once we determine the opex forecast we are satisfied reasonably reflects the opex criteria, it is for a service provider to manage its business as it sees fit. It is for the service provider to decide whether or not to fund particular projects, strategies or

¹⁹⁴ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, p. 93.

commitments to meet the demand for standard control services, comply with regulatory obligations and maintain safety and reliability. Our role is not to dictate how service providers spend money to comply with their broader obligations. We fund service providers so that if they are efficient and prudent, they will have sufficient opex to achieve the objectives.

Opex factors

We must take the opex factors into account in making our assessment of whether a service provider's proposed forecast reasonably reflects the opex criteria. In this way, they function similarly to the revenue and pricing principles. That is, they require us to have regard to matters, but give us discretion as to the weight we should apply to each.¹⁹⁵

Our approach has regard to each of the opex factors set out below:

- the most recent annual benchmarking report that has been published under clause 6.27 and the benchmark operating expenditure that would be incurred by an efficient distribution network service provider over the relevant regulatory control period
- the actual and expected operating expenditure of the distribution 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 distribution 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 distribution network service provider under clauses 6.5.8 or 6.6.2 to 6.6.4
- the extent the operating expenditure forecast is referable to arrangements with a person other than the distribution network service provider that, in our opinion, 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 6.6A.1(b)
- the extent to which the distribution network service provider has considered and made provision for efficient and prudent non-network alternatives

¹⁹⁵ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp 101.

- any relevant final project assessment conclusions report published under 5.17.4(o),(p) or (s)
- any other factor we consider relevant and which we have notified the distribution network service provider in writing, prior to the submission of its revised regulatory proposal under clause 6.10.3, is an operating expenditure factor.

However, for assessing base opex, we have exercised our discretion to emphasise the following factors specified in clause 6.5.6(e):

- the benchmark opex that would be incurred by an efficient service provider—we have had regard to the analysis and techniques used in our recent annual benchmarking report but we have also used other techniques in addition to those discussed in that document
- recent operating expenditure—we use the operating expenditure of the service provider in previous periods, particularly the most recent as a key input into our approach
- the relative prices of operating and capital inputs—we use input prices to trend base opex such that the total forecast opex allowances reasonably reflect a realistic expectation of demand forecast and cost inputs.

We also have regard to the following opex factors which we consider relevant (and which we notified service providers of in our draft decisions):

- 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) any relevant data from international sources
 - (c) data sets that support econometric modelling and other assessment techniques consistent with the approach set out in the Guideline
 as updated from time to time.
- Economic benchmarking techniques for assessing benchmark efficient expenditure including stochastic frontier analysis and regressions utilising functional forms such as Cobb Douglas and Translog.

We identified our preference for using econometric techniques in our explanatory statement to the Guideline.¹⁹⁶

The NER were specifically amended to allow us to take account of additional factors.¹⁹⁷ Service providers were on notice of our intention to use benchmarking from the 2012 rule change. We consider that these factors are particularly relevant to our approach

¹⁹⁶ AER, Expenditure Forecast Assessment Guideline—Explanatory Statement, November 2013, p. 131.

¹⁹⁷ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp 101.

to assessing the service provider's opex forecast and, if necessary, substituting our own opex forecast.

We have used our discretion to give weight to the opex factors which we consider are most relevant to our approach. The AEMC has recognised our discretion in this regard:¹⁹⁸

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.

We have received submissions stating that we have placed unreasonable weight on benchmarking and "almost solely" relied on it as a deterministic or mechanistic tool.¹⁹⁹ They consider benchmarking is but one of the opex factors relevant to forming a view on whether total forecast opex proposals reasonably reflect the opex criteria. Additionally, they consider the NER seek we undertake a broader examination of a service provider's proposal, but that we did not do this in the draft decision.²⁰⁰ Some submissions also state that the purpose of the benchmarking factor is:²⁰¹

...for the AER to consider whether available benchmarking information can provide a partial indicator of the efficiency of the forecast expenditure, and if so the investigations and weight that should be ascribed to that data.

We disagree and consider we have had appropriate and reasonable regard to benchmarking, together with other techniques in assessing the revised proposals.

We agree that benchmarking is one of several opex factors that we are required to 'have regard to'. However, as we explain above, we have discretion as to how we have regard to each opex factor, including how much weight we attach to them. Indeed, the AEMC has stated that we may decide certain factors are not relevant.²⁰² We explained this in our draft decision²⁰³ and the explanatory statement to the Guideline.²⁰⁴

We consider it appropriate to give prominent, but not overwhelming weight to benchmarking base opex based on the robustness of the data and techniques and its utility in overcoming information asymmetry and in providing comparisons amongst firms in the NEM. Many stakeholders agree with this approach.²⁰⁵ Our decision to use

¹⁹⁸ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp 115.

¹⁹⁹ Ausgrid, Revised Regulatory Proposal, January 2015, pp. 15, 134-139.

²⁰⁰ Ausgrid, Revised Regulatory Proposal, January 2015, pp. 15, 134-139.

²⁰¹ Ausgrid, Revised Proposal, January 2015, p. 126; Endeavour Energy, Revised Regulatory Proposal, January 2015, p. 100; Essential Energy, Revised Regulatory Proposal, January 2015, p. 107.

²⁰² AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, p. 115.

²⁰³ AER, Draft Decision, Attachment 7, November 2014, pp. 7-10 to 7-11.

²⁰⁴ AER, Expenditure Forecast Assessment Guideline—Explanatory Statement, November 2013, p. 22.

²⁰⁵ For example, Consumer Challenge Panel, Response to AER Draft Determination Re: ActewAGL Regulatory Proposal 2014-19, February 2015, pp. 10, 26-34; Origin Energy, Submission to Queensland Electricity Distributors'

benchmarking techniques in our assessment of opex is consistent with the recommendations of the Productivity Commission,²⁰⁶ the Australian Government's response to those recommendations²⁰⁷ and the AEMC's intent.²⁰⁸

The Commission considers that benchmarking is a critical exercise in assessing the efficiency of a NSP and approving its capital expenditure and operating expenditure allowances.

Neither the NER nor the AEMC's Final Rule Determination requires us to use benchmarking only as a means of identifying issues for further investigation, as some service providers have suggested.²⁰⁹

We also consider that our benchmarking approach is well supported by the available evidence. We have had regard to the criticisms of this approach, in their proper context of a proposed model followed by subsequent analysis and critique.

Some submissions consider that our reliance on benchmarking in the draft decision would amount to an error of law which ought to result in the invalidity of our decision should we maintain that approach in the final decision.²¹⁰

We disagree with this view because the NER specifically require that we undertake benchmarking, not just arising from the benchmarking opex factor, but also from the opex criteria themselves. As we mention above, the criteria require that we examine efficient costs that an objectively prudent operator would require to achieve the opex objectives.²¹¹ This invites a comparison of service providers. Additionally, the AEMC highlighted the importance of benchmarking in its changes to the NER in November 2012.²¹²

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

By benchmarking a service provider's expenditure we can compare its efficiency over time, and relative to the efficiency of other service providers.

Regulatory Proposals, 30 January 2015, pp. 11-15; AGL, Energex Regulatory Proposal: July 2015 to June 2020 - AGL submission to the Australian Energy Regulator, 30 January 2015, pp. 7-9; Consumer Challenge Panel, CCP2 Panel Submission on Energex and Ergon Energy Capex and Opex Proposals, 30 January 2015, pp. 16-26.

²⁰⁶ Productivity Commission, Electricity network regulatory frameworks – inquiry report, Volume 1, 9 April 2013, pp. 2–3, 187.

²⁰⁷ Australian Government, The Australian Government response to the Productivity Commission inquiry report – Electricity Network Regulatory Frameworks, June 2013, pp. i–ii, 3–9.

²⁰⁸ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp. viii, 107, 113.

²⁰⁹ For example, Frontier Economics, Review of the AER's econometric benchmarking models and their application in the draft determinations for Networks NSW, January 2015, p 10.

²¹⁰ For example, ActewAGL Revised Regulatory Proposal, 2.3.1, when read with section 2.2.4.

²¹¹ NER, clause 6.5.6(c).

²¹² AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. 97.

In previous regulatory periods, we have applied a revealed cost methodology to forecast opex. We have previously not been in a position to assess the efficiency of base opex when applying the revealed cost methodology because we did not have reliable benchmarking data and techniques to make that assessment.²¹³

In this decision, we also use revealed costs. However, we now have reliable and robust data that allow us to assess relative efficiency and, where that assessment demonstrates that revealed costs are materially inefficient, to develop an alternative forecast. In this decision, we have been able to benchmark service providers' opex using various benchmark modelling techniques. We have also applied a range of other quantitative and qualitative techniques to test the validity and consistency of the results. We have:

- used category analysis, which allows us to examine specific key cost drivers between businesses
- conducted detailed reviews of certain historical and proposed opex, such as labour costs.

These approaches are set out in more detail in section A.5.

We have also decided to change the benchmark comparison point, which takes the lowest efficiency score of the service providers in the top quartile of possible efficiency scores rather than the frontier performer (CitiPower). Lowering the benchmark comparison point is an option suggested in response to our draft decision.²¹⁴

We do not agree that adjusting base opex through benchmarking constitutes an unfair post hoc review or disregards our past decisions.²¹⁵ Submissions to this effect misunderstand the purpose of our forecasting approach. The purpose of adjusting revealed costs for benchmarking is not to take back funding allocated in a previous regulatory period. It is to properly assess whether the proposed forecast for the upcoming regulatory control period reasonably reflects the opex criteria. That adjustment is based on an assessment of actual historic costs we know have been sufficient to enable service providers to achieve the opex objectives.

Our economic benchmarking models suggest that there has been a longstanding efficiency gap between the NSW, ACT and QLD service providers and those in other parts of the NEM.²¹⁶

If our benchmarking indicated that the proposed base year opex was relatively efficient, those revealed costs would remain the starting point for assessing future expenditure. Where benchmarking reveals that base opex costs are not a good proxy

²¹³ See AER, Explanatory Statement, Expenditure Forecast Assessment Guideline, p 11.

²¹⁴ For example, PEG, Statistical Benchmarking for NSW Power Distributors, 19 January 2015, p 64.

²¹⁵ For example, Essential, Revised Regulatory Proposal p 29; ActewAGL, Revised Regulatory Proposal p 50.

²¹⁶ See, for example, AER, Draft Decision, Attachment 7, section A.3; AER, 2014 Annual Benchmarking Report, November 2014.

for future forecasts, we are able to take account of this information and adjust the base opex accordingly.

Some service providers suggested that our decision to adjust base opex means that we have not had regard to our previous decisions, or that a step change had occurred from revealed costs to benchmarking.²¹⁷

We do not consider that taking account of further information, which we have collected in compliance with an express requirement in the NER, constitutes a lack of regard to our past decisions. Nor do we consider it a step change. It is not an unavoidable change in activity due to an external obligation.²¹⁸ As set out above, we do not require service providers to spend revenue they recover from consumers on any particular activity, nor do we limit or require their spending to this amount.

All stakeholders should expect us to use new techniques and information when they become available.²¹⁹ We have not moved away from revealed costs. Rather, we have used new techniques to ensure that we are better able to make a decision that reasonably reflects the opex criteria for the future. Our approach represents a refinement of our longstanding approach to assessing opex.

As set out above, our intention to use benchmarking has been the subject of an AEMC rule change and extensive consultation. The results of our benchmarking indicate that previous incentive signals and schemes used to motivate service providers were not sufficient.

Our approach gives due regard to the service providers' proposals and individual circumstances

Broadly, service providers have submitted that by relying on benchmarking as part of our assessment approach, we have:

- not started our assessment with their regulatory proposals or examined which aspects of their proposals involve inefficient expenditure in any level of detail²²⁰
- failed to comply with the NER requirements to have regard to their individual circumstances.²²¹

²¹⁷ ActewAGL, Revised Regulatory Proposal p 50; Ergon Energy Submission on Draft Decision p 9.

²¹⁸ See Application by Ergon Energy Corporation Limited (Labour Cost Escalators) (No 3) [2010] ACompT 11 at [194](d).

²¹⁹ We have indicated in previous decisions and in defending those decisions our preference to use up to date information where possible. The Tribunal has endorsed this approach and indicated a similar preference: see for example Application by Ergon Energy Corporation Limited (Labour Cost Escalators) (No 3) [2010] ACompT 11 at [61] to [62].

²²⁰ Ausgrid, Revised Regulatory Proposal, pp. 27, 122, 134-136; Networks NSW, NSW distributors' submission on the AER's draft determinations, 13 February 2015, pp. 6-9.

²²¹ Ausgrid, Revised Regulatory Proposal, pp. 10, 151-153.

The service providers' proposals

We consider that we have had due regard to the service providers' opex proposals. As outlined by the AEMC,²²² in our draft decision and in our assessment approach, we start by looking at the service provider's proposal. Our assessment approach is built around a mechanism to assess the proposal to determine whether it reasonably reflects the opex criteria. Where we find the service provider's proposal does not reasonably reflect the opex criteria, we use that same mechanism to determine an alternative forecast.

As we discussed in the explanatory statement to the Guideline, information asymmetry and the inherent incentive to inflate expected expenditure needs means that we must test the service providers' proposals robustly.²²³ Benchmarking is, in our view, an appropriate means of doing this and is consistent with the AEMC's intent.²²⁴

Importantly, though, [the NSP's proposal] should be only one of a number of inputs. Other stakeholders may also be able to provide relevant information, as will any consultants engaged by the AER. In addition, the AER can conduct its own analysis, including using objective evidence drawn from history, and the performance and experience of comparable NSPs. The techniques the AER may use to conduct this analysis are not limited, and in particular are not confined to the approach taken by the NSP in its proposal.

Further, as is clear from our draft decision and this final decision, we have engaged closely with the assumptions and submissions in the proposal. For example, we have engaged in a detailed assessment of operating environment factors (see section A.6). We also explicitly examined ActewAGL's proposal and undertook detailed reviews of labour practices and vegetation management (see section A.5). Finally, a key step in our overall opex assessment approach is to assess the service provider's proposed forecasting approaches (see section 7.4.1).

Individual circumstances

Our base opex assessment approach gives extensive regard to the service providers' circumstances, as required by the NER and in accordance with the intent of the AEMC. The individual circumstances of a service provider can be exogenous (beyond their control) such as topography and climate, or endogenous (within their control) such as their approach to contracting. The AEMC expressed how it envisaged benchmarking would be applied as follows.²²⁵

²²² AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp 90, 95, 96, 111. See also: AER, Explanatory Statement, Expenditure Forecast Assessment Guideline, p 7.

²²³ AER, Expenditure Forecast Assessment Guideline—Explanatory Statement, November 2013, pp. 27-28.

²²⁴ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp. 111-112.

²²⁵ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, p. 113. See also pp. viii, 25, 98, 107-108.

The final rule gives the AER discretion as to how and when it undertakes benchmarking in its decision-making. However, when undertaking a benchmarking exercise, circumstances exogenous to a NSP should generally be taken into account, and endogenous circumstances should generally not be considered. In respect of each NSP, the AER must exercise its judgement as to the circumstances which should or should not be included.

Individual circumstances are taken into account throughout our approach (including benchmarking):

- First, the benchmarking techniques which we use to compare service providers take into account many of their individual circumstances, most notably their key network characteristics²²⁶ and their actual operating expenditure.
- Second, this process disaggregates those circumstances which we consider reflect inefficiency from those which are exogenous or uncontrollable factors.
- Third, we make appropriate adjustments to the benchmarking results based on findings from other techniques such as detailed review and analysis of operating environment factors. This is consistent with our discretion to make appropriate and transparent decisions on a case by case basis.²²⁷

We disagree with those service providers who submit that having regard to their circumstances preclude us from giving substantial weight to benchmarking. The clear intention of the AEMC was to remove restrictions on the AER's use of benchmarking.²²⁸

The Commission considers that the removal of the "individual circumstances" phrase will clarify the ability of the AER to undertake benchmarking. It assists the AER to determine if a NSP's proposal reflects the prudent and efficient costs of meeting the objectives.

Our approach gives substantial weight to the individual circumstances of the service provider that are relevant to our task, whilst allowing us to use benchmarking as part of our approach.

A.3.3 Our approach is consistent with the incentive regime

Some service providers have submitted that they developed their current business structure in good faith reliance on our prior determinations on what is efficient opex. They submit, therefore, that if they are required to align expenditure with a reduced level of opex determined by a new and substantially different method, then the

²²⁶ Depending on the technique, we account for line length, customer density, energy density, demand density, reliability, degree of undergrounding etc.

²²⁷ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp 10.

²²⁸ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp 107, 113.

reasonable costs incurred in the course of doing so must be considered to be efficient.²²⁹

In making this statement, these service providers appear to misunderstand the basis of our forecasting approach. We do not determine that past spending against a previous forecast is inefficient if it is below the forecast total opex we previously approved. Rather, we reward this lower actual expenditure through the EBSS.

However, that does not mean that a past level of expenditure is appropriate for making a forecast of costs against the opex criteria for a future regulatory control period. The NER is an incentive framework. The opex forecast we approve, together with the relevant schemes, provide bonuses for improving efficiency while maintaining or improving service standards, beyond the previous period's revealed costs. This regime encourages businesses to be as efficient as is prudent to beat the total opex forecast and continuously improve their efficiency. In that context, a network business should not be expecting to receive historical costs whenever a new forecast of total opex is assessed.

The AER makes decisions on the basis of the relevant evidence it has before it at the time. In 2009, on the basis of the evidence before us, and also having regard to the circumstances in which we made our decision, we determined what we considered to be an appropriate basis for forecasting total opex for the period 2009–14.

We have additional evidence now, through more detailed benchmarking. As we note above, our benchmarking results indicate that several service providers spend considerably more on a standardised basis than other businesses in the NEM to provide services in a manner that achieves the opex objectives. In assessing future forecasts we need to have regard to this new information.

One of benchmarking's positive attributes is that it increases the incentive to reduce opex. This is something that HoustonKemp acknowledges.²³⁰ We consider that this increased incentive reflects a decision that is in the long term interests of consumers and reflects the opex objectives.

Despite this, HoustonKemp considers that our approach is inconsistent with the NEO.²³¹ We disagree. If benchmarking shows a distributor's revealed opex is materially inefficient, it is not possible to set an opex forecast based solely on revealed expenditure that is consistent with the opex criteria. Such an approach would ignore relevant considerations and techniques which we regard as robust and important. The AEMC agrees.²³² In such circumstances, therefore, benchmarking will deliver an

²²⁹ For example, ActewAGL, letter to Paula Conboy, 4 March 2015, p. 2.

²³⁰ HoustonKemp, AER Determination for ActewAGL Distribution - Contribution to NEO and preferable NEO decision, 13 February 2015, pp. 26-27.

²³¹ HoustonKemp, AER Determination for ActewAGL Distribution - Contribution to NEO and preferable NEO decision, 13 February 2015, pp. 26-27.

²³² AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp 107, 113.

alternative forecast that achieves the NEO to a greater degree than revealed expenditure.

A.3.4 The benchmarking we rely on in our approach is robust, reliable and reasonable

Service providers have submitted that our benchmarking is fundamentally flawed because:²³³

- our analysis is not robust
- we have made errors in the application of our models
- we should have regard to conceptual limitations of benchmarking, particularly given the heterogeneity of Australian service providers
- the RIN data used in the benchmarking contains problems
- there has been a lack of testing and peer review.

Economic Insights responds to these submissions in detail in its report, and we explain in section A.2 why benchmarking is appropriate in the context of our ex ante regulatory framework. We also outline why our benchmarking is robust, reliable and reasonable in section A.4. Further, we demonstrate the alternative approaches proposed by the distributors are not robust. For example, some of the alternative approaches proposed by the distributors:²³⁴

- misunderstand the rationale for using international data and, consequently, the manner in which Economic Insights has used it
- include outputs that reflect secondary cost drivers rather than functional outputs, which can reward inefficient practices
- exclude key functional outputs—CEPA, for example, presents a function with only one or two outputs, which is not adequate to accurately model distributor cost characteristics
- inappropriately incorporate some operating environment variables without considering their potential effect on the model—depending on the estimation method used, the 'capital intensiveness' (or equivalent) variable, for example, overstates the opex efficiency of the ACT, NSW and QLD distributors simply because they own assets with a capacity of more than 66kV
- suggest the inclusion of many unjustified operating environment variables, which can undermine the ability of a model to explain the relationship between inputs and outputs

²³³ For example, Ausgrid, Revised Regulatory Proposal, pp. 129-153.

²³⁴ Economic Insights, Response to Consultants' Reports on Economic Benchmarking of Electricity DNSPs, April 2015, section 3.

- use estimation methods that are not robust because of the underlying assumptions they make about the nature of inefficiency.

In this section, we set out some general principles regarding the nature of benchmarking.

This decision is the first time that we have had sufficient information to conduct rigorous benchmarking analysis. However, we have done so over a long consultation period, using data provided and cross-checked by the service providers themselves. We have used benchmarking analysis in a way that acknowledges benchmarking cannot produce a single "right" answer—but we also rely on benchmarking as an important technique for assessing base opex.

Frontier Economics agree that no single "right" answer exists. It acknowledges both the power of benchmarking and the impressive knowledge the AER's expert (Economic Insights) brings to the subject matter.²³⁵ Huegin makes the same point.²³⁶ Huegin also notes that "the approach that appears to be most common in regulatory jurisdictions around the world is to use a combination of results from different benchmarking techniques to arrive at relative levels of efficiency between businesses."²³⁷

Accordingly, the level of confidence we require to use benchmarking is that which assists us in being satisfied or dissatisfied that a proposal or comparative estimate reasonably reflects the opex criteria. We are confident that our approach provides us with the necessary comfort to use benchmarking in this way. We therefore disagree with the submission by Frontier Economics that we have placed undue reliance on our benchmarking approach.²³⁸ We do not agree with suggestions by service providers that:²³⁹

- Australian data is unreliable
- international data is inapplicable, and
- our benchmarking results do not accord with sensibility checks.²⁴⁰

The Australian data was supplied by the service providers themselves, in accordance with our compulsory information gathering powers. We required Australian data

²³⁵ Frontier Economics: Review of the AER's econometric benchmarking models and their application in the draft determinations for Networks NSW (January 2015) p vii.

²³⁶ Huegin, Huegin's response to Draft Determination on behalf of NNSW and ActewAGL Technical response to the application of benchmarking by the AER, 16 January 2015, pp. 7, 13.

²³⁷ Huegin, Huegin's response to Draft Determination on behalf of NNSW and ActewAGL Technical response to the application of benchmarking by the AER, 16 January 2015, p 11.

²³⁸ Frontier Economics: Review of the AER's econometric benchmarking models and their application in the draft determinations for Networks NSW (January 2015).

²³⁹ Frontier Economics: Review of the AER's econometric benchmarking models and their application in the draft determinations for Networks NSW (January 2015) pp vii, ix.

²⁴⁰ Endeavour, Revised Regulatory Proposal, p. 179. Ausgrid, Revised Regulatory Proposal, pp. 150–153. Essential, Revised Regulatory Proposal, p. 189.

provided by service providers to be audited and certified by statutory declaration by the CEOs of the service providers. We obtained international data from comparable jurisdictions where similar analysis had previously been conducted.²⁴¹

As we explain in section A.4 we have conducted detailed review of the Australian data, and the international data has been used by the regulators in the respective jurisdictions for determinations. Therefore, we consider that the data we have used for benchmarking is robust for this purpose. Economic Insights also considers that the data is sufficiently robust for benchmarking. The approach taken by Economic Insights produced a functional data set which is both consistent across benchmarking techniques, is dataset insensitive and has undergone significant testing and cross-checking.²⁴²

It is true that as service providers continue to provide audited information, the dataset will improve still further. However, this does not mean that we are not sufficiently confident at this stage to use benchmarking to assess base operating expenditure. We reject the suggestion that the EI approach is unreliable. The results it has produced are consistent with our other analyses, such as our detailed review of base year opex and our cross checking of our benchmarking results.

We have also considered our modelling in light of the service providers' operating environment factors and the potential for data and modelling issues. We have reviewed the operating environment circumstances that service providers proposed, or which we independently considered, might explain differences in costs compared to other jurisdictions. We have also conducted analysis using other techniques to cross-check the benchmarking results. We disagree, therefore, that we have not conducted 'sensitivity checks' of our benchmarking.

Indeed, we have ultimately made cautious adjustments to the SFA benchmarking results to ensure that any adjustments to base opex:

- exclude differences caused by factors other than inefficiency
- appropriately account for potential data and modelling issues that could adversely affect the service providers.

The expert reports prepared for the service providers indicate distinct areas where the authors disagree with Economic Insights' draft decision report. However, benchmarking is something that reasonable minds will invariably differ on. As identified above, Frontier Economics and Huegin acknowledge this. Economic Insights' view is that its models are more robust than those produced by the service providers' consultants.

Therefore, for the reasons set out in section A.4 and Economic Insights' final decision report, we do not consider that these criticisms do more than identify alternative

²⁴¹ Economic Insights, 2014, p. 29.

²⁴² Economic Insights, 2014, p. 32.

possible answers to the benchmarking question. We are not persuaded that Economic Insights' approach is materially affected by the issues raised by the service providers' consultants. We remain satisfied that, despite expected disagreement about outcomes, our use of benchmarking in our assessment approach is consistent with the NER and the NEL.

A.3.5 Procedural fairness matters

In its revised regulatory proposal, ActewAGL submitted that it had not been afforded procedural fairness. In particular, ActewAGL submitted:²⁴³

- By publishing our first annual benchmarking report two months late, we have limited their time to make a detailed response to the issues contained within for the purposes of their revised proposals
- The models we used in the draft decision are not consistent with those set out in the Guideline
- We did not consult with the technical regulator in the ACT
- We either provided certain documents under embargo or did not provide certain information on confidentiality grounds.

As noted above and set out in Table A.2 below, we have been engaged in a lengthy consultation process with the service providers dating back several years. This program of consultation has involved staff interactions with the service providers and their officers and employees. Our consultation process provided service providers with an extension of time and limited the reach of its regulatory information notices under the NEL.

ActewAGL nevertheless now submits that we failed to provide them with procedural fairness. We disagree with these submissions.

Table A.2 Full process of the development of benchmarking data set

Milestone	Date
ACCC/AER working paper on benchmarking in electricity networks released. This report provides a comprehensive list of data that had been used in previous energy benchmarking studies.	May-12
AER releases issues paper on expenditure forecast assessment guideline. Issues paper includes: <ul style="list-style-type: none"> • detailed description of benchmarking techniques • data on the inputs and outputs for benchmarking electricity networks • potential applications of benchmarking techniques 	Dec-12

²⁴³ ActewAGL, Revised Regulatory Proposal, pp. 79-81, 106-107, 116-122

Milestone	Date
AER workshop – general Guideline consultation - Initiation roundtable	Feb-13
Economic benchmarking workshop on outputs	Mar-13
Economic benchmarking workshop on inputs	Mar-13
Economic benchmarking workshop on measurement of outputs and environmental factors	Apr-13
Economic benchmarking techniques workshop on network input measurement	May-13
Preliminary RIN templates circulated for comment	Jun-15
Revised preliminary RIN templates circulated for comment	Jul-13
Draft Economic benchmarking RINs released	Sep-13
Draft Guideline released	Aug-13
Workshop RIN auditing requirements & economic benchmarking data requirements	Oct-13
Final Guideline released	Nov-13
Final RINs for economic benchmarking released	Nov-13
AER answers questions regarding how the economic benchmarking RIN templates are to be completed.	Nov 14
<p>Unaudited RIN responses received AER initiates comprehensive review of RIN data. Review includes:</p> <ul style="list-style-type: none"> • Comparing RIN information with information previously reported by distributors to ensure consistency such as regulatory proposals, previous RIN responses and distributor annual reports • reviewing time series data to identify any anomalous data points • Reviewing basis of preparation to ensure that data has been prepared in accordance with EBT RIN instructions and definitions • Comparing data across distributors to identify potential anomalies. 	Mar-14
Final audited RIN responses received	Apr-14
Benchmarking data released for public consultation	May-14
Draft benchmarking report and data circulated to NSPs and other stakeholders	Aug-14

Provision of the annual benchmarking report

We prepared an annual benchmarking report (Report) consistent with the requirements of the NER and the NEL.²⁴⁴ We undertook an extensive process of consultation and data collection and validation as part of this process. Service providers were intricately involved in the design and validation of the Report and the underlying data per Table A.2.

We published the Report in November 2014, rather than September 2014 as contemplated in the NER.²⁴⁵ However, service providers had access to our methodology and underlying data and (from August 2014) a draft report that was largely reflected in the Report that was published.

We are required to have regard to the annual benchmarking report, in reaching our decision, which we have done.²⁴⁶ We have built on our annual benchmarking report and used additional techniques and analysis in having regard to the benchmark opex of an efficient provider for the purposes of this decision. We are not required to apply the methodology from the most recent benchmarking report in reaching our final decision.²⁴⁷ We have, as contemplated by the NER, included other factors in our approach.²⁴⁸

Some service providers have made two, somewhat contradictory claims about the above process:²⁴⁹

- First, they say that not being served with the final report meant that they were deprived of the opportunity to be heard in relation to the Report before the publication of our draft decision; and
- Second, they say that we have departed from the Report in our draft decision by adopting different economic benchmarking techniques.

We acknowledge that the final Report was provided outside the time specified in the NER. ActewAGL submits that this caused it to suffer a lack of procedural fairness. The requirements of procedural fairness "are essentially practical and depend upon the legislative framework and the circumstances of the particular case."²⁵⁰ Here, those circumstances included:

- service providers having access to a draft of the Report and all the data used in the Report itself, as well as an extensive period of consultation;

²⁴⁴ NER 6.27(a).

²⁴⁵ NER 6.27(a) required the chapter to be published by 30 September 2014.

²⁴⁶ NER 6.6.5(e)(4).

²⁴⁷ NER 6.27(a).

²⁴⁸ NER 6.5.2(e)(12).

²⁴⁹ ActewAGL Revised Regulatory Proposal pp 81, 106-107, 116-122.

²⁵⁰ *CPCF v Minister for Immigration and Border Protection* [2015] HCA 1 at [306].

- the AER publishing a further, detailed report which set out our approach to assessing the benchmark opex of an efficient provider for the purposes of the draft decision.²⁵¹

The criticisms of our approach to benchmarking in the draft decision are, understandably, focused on our approach in the draft decision rather than the Report.

ActewAGL has not identified any practical difficulties or injustice occasioned by the late publication of the Report. We do not consider the late publication of the Report amounts to a lack of procedural fairness for the purposes of the decision we must make about the service providers' forecast opex proposals.

Consistency of benchmarking models used in draft decision

A number of submissions note that we indicated that we would apply data envelopment analysis (DEA) in the Guideline. At the time of developing the Guideline, we had not received data from service providers so we considered DEA may be another technique we could apply. However, given the data quality and the availability of international data, we have been able to apply SFA (stochastic frontier analysis). This is a superior technique to DEA due to its direct estimate of opex cost efficiency relative to an estimated frontier.²⁵²

To the extent that this represents a departure from the approach specified in the Guideline, clause 6.2.8(c) of the NER states:

Except as otherwise provided in this Chapter, a guideline is not mandatory (and so does not bind the AER or anyone else) but, if the AER makes a distribution determination that is not in accordance with the guideline, the AER must state, in its reasons for the distribution determination, the reasons for departing from the guideline.

Accordingly, the above explanation constitutes our reason for departing from the Guideline.

We disagree that we have caused an "injustice" to the service providers by not consulting more than nine days prior to the draft decision on the benchmarking techniques we have used that are not also included in our benchmarking report.²⁵³ We consider ActewAGL has not demonstrated practical unfairness given that it responded in detail to our draft decision. Further, the consultation process we undertook for Better Regulation, the Guideline, and the explanatory statement to the Guideline all foreshadowed our intention to use econometric modelling if possible.

For the above reasons, we consider that our decision is not affected by any lack of procedural fairness or natural justice.

²⁵¹ Economic Insights, 2014.

²⁵² Economic Insights, 2014, p. 28.

²⁵³ ActewAGL, Revised Regulatory Proposal, pp.116-122.

Consultation with technical regulators

ActewAGL submits that we did not consult on our benchmarking with the ACT technical and safety regulator. While we may not have stated this in our draft decision, we did consult with all relevant technical and safety regulators while preparing our first annual benchmarking report. This is a requirement of clause 8.7.4(b)(2) of the NER.

Provision of documents under embargo and confidentiality

Our provision of documents under embargo was consistent with our Confidentiality Guideline and was standard practice. ActewAGL has failed to identify any way in which having embargoed access to some documents (which are not identified), caused it to suffer any procedural unfairness. Service providers have relied on our Confidentiality Guideline to protect their own confidential information in their proposals.

We are not required to provide confidential information to service providers simply on the basis of requests. We treat confidential information seriously and in accordance with our Confidentiality Guideline. No service provider has identified any way in which a lack of access to this material caused it to suffer material or substantive unfairness of any kind.

A.4 Our benchmarking is robust, reliable and reasonable

In this section we set out our analysis of the benchmarking techniques we have used to test whether base year opex of the service providers is efficient. In particular, we reiterate why our approach and results are robust, reliable and reasonable. In doing so, we explain why our approach is preferable to those proposed by the service providers and their consultants.

In this section we set out our benchmarking metrics that examine the efficiency of opex as a whole.²⁵⁴ Category analysis metrics are considered separately in section A.5.

A.4.1 Position

Our decision is to rely on the same benchmarking analysis that we applied in our draft determination to test the efficiency of the service providers' revealed opex. In coming to this view, we have considered the submissions of the service providers, their consultants and legal advisors, consumer representatives and other stakeholders.

We consider our benchmarking—including the data we have used—is robust, reliable and reasonable. In reviewing the alternatives put forward by the service providers' consultants we have identified shortcomings. Issues identified with the consultant's models include.²⁵⁵

- only using the Australian data set which has inadequate variation to support robust model estimation
- including inappropriate operating environment factors (such as a 132kV line variable) leading to inefficiency gaps being understated
- applying models that make inappropriate assumptions about the nature of inefficiency and hence allocate persistent inefficiency to operating environment differences
- applying models that will misleadingly find service providers to be 'efficient by default'

We summarise the key concerns and provide our responses in Table A.3. Economic Insights provides detailed responses in its report.²⁵⁶

²⁵⁴ These include our partial performance indicators, opex MPFP, and Econometric models.

²⁵⁵ Economic Insights, Response to Consultants' Reports on Economic Benchmarking of Electricity DNSPs, April 2015, p. 53. (Economic Insights, 2015).

²⁵⁶ Economic Insights, 2015.

Table A.3 Summary of service providers' key benchmarking submissions and our response

Service provider submission	Our response	Reference
	Conceptual limitations do not exist:	
'Conceptual limitations' with benchmarking exist including: ²⁵⁷		
1. the inability to differentiate between observed cost differences due to inefficiency or something else	1. we have extensively examined the extent to which the efficiency gap could be driven by other factors in our operating environment factor assessment, to identify and quantify the impact of factors that are relevant and not already accounted for in the model	We discuss these submissions in section A.4.3 under:
2. the heterogeneity of Australian service providers make it impossible to normalise for differences, leading to bias in the models	2. Australian service providers are comparable in using opex and capital input in providing electricity distribution services to customers. To the extent that operating environments are different, we have considered this under our ex-post operating environment factor assessment	1. Model specification, estimation methods 2. Model specification, estimation methods
3. previous doubts about data quality and the scope to apply benchmarking by the AEMC, the PC, the AER and Economic Insights.	3. prior comments about data quality and limitations of benchmarking are outdated. Our review and Economic Insights' review of the database indicates that it is sufficiently robust for the application of benchmarking techniques.	3. Data.
Errors exist in the application of benchmarking, including:	We have used a robust, reliable and reasonable approach that is not in error:	We discuss these submissions in section A.4.3 under:
1. using an untested and non-peer reviewed model ²⁵⁸	1. Economic Insights' models are informed by economic theory, engineering knowledge and industry. The draft decision provided for the service providers to engage their own experts to review Economic Insights model, and we have considered these reports.	1. Model specification
2. inconsistent results ²⁵⁹		2. Efficiency results
3. use of a false frontier ²⁶⁰		3. We discuss this in the adjustments section.
4. poor variable selection ²⁶¹		4. Model specification and data
5. use of a dummy variable ²⁶²	2. The approaches taken by the service providers' consultants to criticise the model results are not sound	5. Data
6. insufficient data preparation ²⁶³		6. Data
7. post model adjustments ²⁶⁴	3. We consider Economic Insights' approach is more reasonable than the alternatives proposed by the service providers.	
8. no reasonableness check of results. ²⁶⁵		

²⁵⁷ Ausgrid, Revised Regulatory Proposal, pp. 130-142; ActewAGL, Revised Regulatory Proposal, pp. 125-134, attachment C12.

²⁵⁸ Ausgrid, Revised Regulatory Proposal, p. 143; ActewAGL Revised Regulatory Proposal, pp. 150-153.

²⁵⁹ Ausgrid, Revised Regulatory Proposal, p. 143; ActewAGL Revised Regulatory Proposal, pp. 146-149, 175-181.

²⁶⁰ Ausgrid, Revised Regulatory Proposal, pp. 143-144.

²⁶¹ Ausgrid, Revised Regulatory Proposal, pp. 144-147; Herbert Smith Freehills, AER Draft Decision – Forecast Operating Expenditure (confidential), 13 February 2015, pp. 8-9.

²⁶² Ausgrid, Revised Regulatory Proposal, p. 147.

²⁶³ Ausgrid, Revised Regulatory Proposal, pp. 143-150 and Herbert Smith Freehills, AER Draft Decision – Forecast Operating Expenditure (confidential), 13 February 2015, pp. 10-11; ActewAGL, Revised Regulatory Proposal, pp. 140-146.

²⁶⁴ Ausgrid, Revised Regulatory Proposal, p. 150; ActewAGL Revised Regulatory Proposal, pp. 153-166.

Service provider submission	Our response	Reference
	<p>4. The variables included in the models are appropriate and international data is required for accurately estimating parameter estimates</p> <p>5. The service providers' consultants have misunderstood the purpose of the international data and the role of country dummy variables.</p> <p>6. The data is robust and reliable and the concerns raised by the service providers are misplaced.</p> <p>7. Economic Insights' two stage approach is appropriate and indeed much more reasonable than alternatives proposed by the service providers' consultants.</p> <p>8. We have conducted several reasonableness checks of the results including PPIs, category analysis and detailed review.</p>	<p>7. Model specification</p> <p>8. Efficiency results.</p>

Advice from Herbert Smith Freehills specifically comments on Economic Insights' use of international data. Key comments include:²⁶⁶

- Economic Insights' model is heavily reliant on overseas data
- overseas data is not comparable with Australian data
- Economic Insights does not adequately account for differences between countries
- Economic Insights' data contains errors.

The service providers, their consultants and Herbert Smith Freehills have misunderstood how Economic Insights has used international data. Economic Insights has used the international data only to more accurately estimate parameter estimates, not as comparators for the Australian service providers. Further, Economic Insights considers submissions on the international data quality are misguided given that international regulators have used it for benchmarking and have undertaken similar testing and validation to the AER.²⁶⁷

We address these matters as part of our discussion on data in section A.4.3.

Our PPIs do not support the economic benchmarking results because:

- we have not acknowledged the inherent limitations.²⁶⁸
- per-customer metrics are biased against rural service providers and do not show relative efficiency.²⁶⁹

Our view remains that PPIs are complementary to economic benchmarking and are an appropriate means crosschecking validity.

We address this submission in our discussion on PPIs in section A.4.3.

²⁶⁵ Ausgrid, Revised Regulatory Proposal, p. 151; Herbert Smith Freehills, AER Draft Decision – Forecast Operating Expenditure (confidential), 13 February 2015, p. 9.

²⁶⁶ Herbert Smith Freehills, AER Draft Decision – Forecast Operating Expenditure (confidential), 13 February 2015, pp. 6-8.

²⁶⁷ Economic Insights, 2015, pp. 20, 26.

²⁶⁸ ActewAGL, Revised Regulatory Proposal, pp. 181-187.

²⁶⁹ Essential revised proposal, pp. 201-202.

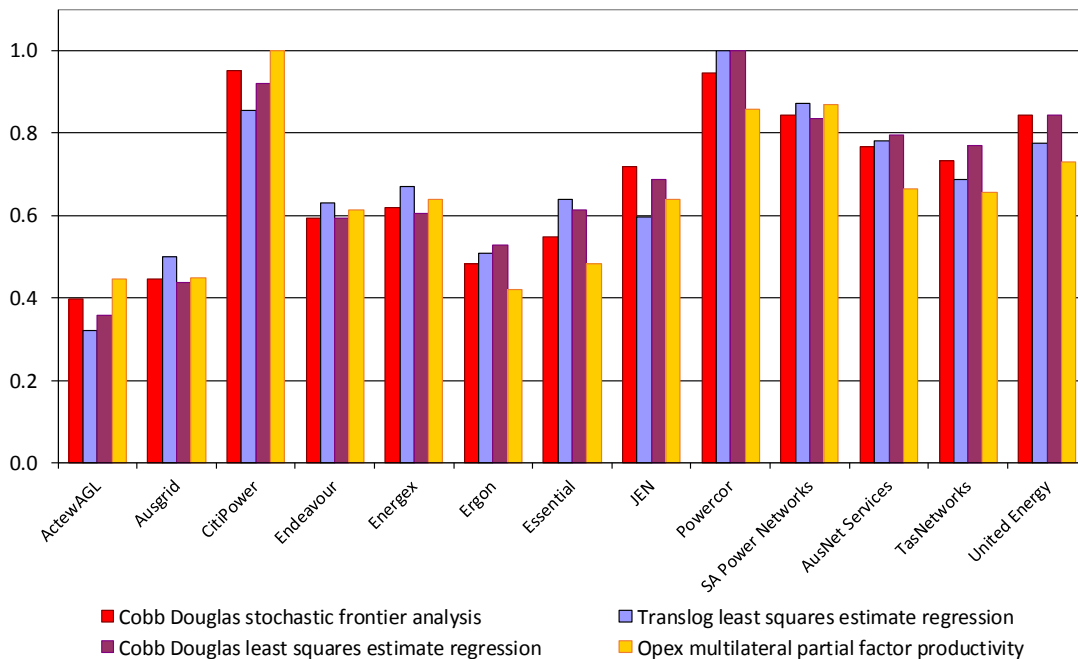
A.4.2 Draft position

In our draft determination we applied six benchmarking techniques to assess the efficiency of the service provider's revealed expenditure. Four of these techniques (which were developed by Economic Insights) enable us to assess relative opex efficiency. On the basis of advice from Economic Insights, we relied on Economic Insights' Cobb Douglas SFA model as the preferred technique for this purpose.

Figure A.5 presents the results of each of Economic Insights' four opex models (stochastic frontier analysis (SFA), econometric regressions and opex MPFP) for each service provider in the NEM. A score of 1 is the best score.

The red bars in Figure A.5 represent the SFA results. The best performing service provider under this model is CitiPower, with a score of 0.95. We refer to CitiPower as the 'frontier' firm.

Figure A.5 Econometric modelling and opex MPFP results (average efficiency scores for 2006 to 2013)



Source: Economic Insights, 2014.

Each model may differ in terms of estimation method or model specification and accounts for operating environment circumstances (factors that may differentiate service providers) to differing degrees. Accordingly, the results will never be identical. However, Figure A.5 demonstrates that the results of the four models are consistent. The models show that the efficiency of ActewAGL's revealed expenditure does not compare favourably with that of many of their peers.

The Cobb Douglas SFA model, being a statistical technique, directly estimates the efficient opex cost function. In doing so it takes into account economies of scale, density and the relationship between opex and the multiple outputs service providers face. Further the Cobb Douglas SFA model has a random error term that separates the effect of data noises or random errors from inefficiency.²⁷⁰ It is, therefore, the most sophisticated of Economic Insights' economic benchmarking techniques.

We considered the two other econometric models (Cobb Douglas LSE and Translog LSE) provided useful cross checks for the Cobb Douglas SFA model. The Translog LSE model allows for a more flexible opex cost functional form incorporating second order coefficients. If the Translog LSE model had produced inconsistent results it might indicate that one of the other models was inappropriately capturing the opex cost function. The LSE and SFA Cobb Douglas models both estimate efficiency using slightly different techniques. By running both methods we could observe whether the efficiency measurement technique made a material difference to relative efficiency performance.

Economic Insights found that all three econometric techniques produced consistent results.²⁷¹

The efficiency scores across the three econometric models are relatively close to each other for each DNSP [distributor] and they are, in turn, relatively close to the corresponding MPFP score. This similarity in results despite the differing methods used and datasets used reinforces our confidence in the results.

Additionally, we used opex MPFP and MTFP (index-based techniques) as a different means of checking the more sophisticated econometric models.

As an opex specific technique, opex MPFP provided a means of using a relatively less data intensive approach—capable of incorporating five outputs and four inputs and some operating environment factors—with an Australian-only service provider dataset.

MTFP played an important role as the overarching indicator of total productive efficiency and, consequently, as a check on the techniques that examine opex efficiency. This is necessary because a service provider could, for example, appear to be inefficient in the use of opex alone, but be efficient overall.

Economic Insights found the MTFP and opex MPFP results supported the econometric models.²⁷²

Finally, we used PPIs, which are simple, intuitive metrics to provide another perspective on the relative efficiency of service providers. The PPIs only focus on one aspect of a service provider's performance and do not specifically capture operating environment differences. However, bearing these limitations in mind, we considered they were consistent with the other, more sophisticated benchmarking results.

²⁷⁰ Economic Insights, 2014, p. 7.

²⁷¹ Economic Insights, 2014, pp. 46-47.

²⁷² Economic Insights, 2014, p. 46-47.

A.4.3 Revised proposals and submissions

In response to our draft decision for the NSW service providers and ActewAGL, these service providers submitted a large amount of material expressing concerns with our approach to benchmarking and the results. This included reports from the following consultants:

- Frontier Economics²⁷³
- Huegin²⁷⁴
- Cambridge Economic Policy Associates (CEPA)²⁷⁵
- Pacific Economics Group Research (PEGR)²⁷⁶
- Advisian (formerly Evans and Peck)²⁷⁷
- Pricewaterhouse Coopers (PwC).²⁷⁸

In addition to submissions from other stakeholders, on 13 February 2015 we received from service providers further legal opinion and consultant reports on benchmarking from:

- Herbert Smith Freehills (submitted by the NSW service providers)
- Young and McClelland (submitted by ActewAGL)
- Huegin (two reports, submitted by Ergon Energy)
- Synergies (two reports, submitted by Ergon Energy)
- Frontier Economics (submitted by Ergon Energy)
- Ernst & Young (EY) (submitted by Ergon Energy).

Economic Insights addresses this material in the report it has prepared for this final decision. In this section, we have grouped the key benchmarking issues raised by the service providers and their consultants into:

- model specification
- data

²⁷³ Ausgrid, Revised Regulatory Proposal, Attachment 1.05.

²⁷⁴ Ausgrid, Revised Regulatory Proposal, Attachment 1.06; ActewAGL, Revised Regulatory Proposal, Attachment C4.

²⁷⁵ Ausgrid, Revised Regulatory Proposal, Attachment 1.07; ActewAGL, Revised Regulatory Proposal, Attachment C3.

²⁷⁶ Ausgrid, Revised Regulatory Proposal, Attachment 1.08.

²⁷⁷ Ausgrid, Revised Regulatory Proposal, Attachment 1.09; ActewAGL, Revised Regulatory Proposal, Attachment C2.

²⁷⁸ Ausgrid, Revised Regulatory Proposal, Attachment 1.10.

- estimation methods
- efficiency results.

We discuss each topic below. Consistent with our approach in the draft decision, we have adopted Economic Insights' approach and recommendations on the basis of its expertise in economic benchmarking, including the application of economic benchmarking in the regulatory context. Accordingly, to the extent we refer to 'our approach' or 'our model', this should be interpreted as the approach and models recommended by Economic Insights' and applied in its analysis. Economic Insights' final decision report contains detailed analysis and explanation of its approach and results in light of the information submitted by the service providers and their consultants.

Model specification

Model specification relates to the specification of the outputs, inputs and operating environment variables that Economic Insights has used in its benchmarking model.

In this sub-section, we compare Economic Insights' model specification to the alternatives proposed by the service providers' consultants. First, we reiterate why Economic Insights' modelling approach is robust and reliable. Second, we restate why the inputs, outputs and operating environment factors Economic Insights has chosen are appropriate. Finally, we explain why the alternative models proposed are not robust or reliable.

Our approach is robust and reliable

Economic Insights' model specification has been developed using a logical, structured and consultative approach. We set out this approach below.

The first step we took in developing our benchmarking data base was to consult criteria for selecting input, output and operating environment factors. We set out our initial selection criteria in our issues paper we released for the Guideline.²⁷⁹ Our final selection criteria are set out in the explanatory statement to the Guideline.²⁸⁰

We also developed a broad data set for benchmarking. In developing this data set we considered the model specifications applied in other service provider benchmarking studies.²⁸¹

As part of the Better Regulation reform program we hosted open workshops which were chaperoned by Economic Insights. In these workshops we consulted on engineering, accounting and economic aspects of the model specification with service providers and other interested stakeholders. We published numerous papers on the

²⁷⁹ AER, Issues paper, expenditure forecast assessment guideline, December 2012, pp. 82–136.

²⁸⁰ AER, Explanatory statement, expenditure forecast assessment guideline, 2013, November 2013, pp. 145–146.

²⁸¹ AER, Issues paper, expenditure forecast assessment guideline, December 2012, p. 77.

inputs, outputs and operating environment circumstances of service providers and how these should be measured.

In light of the selection criteria and workshops Economic Insights developed a preliminary model specification which we stated we would test once we collected data.²⁸² Once we received data Economic Insights ran a number of different model specifications including the preliminary model specification.²⁸³ Economic Insights identified a preferred MPFP model specification on the basis that this specification was not biased towards a particular type of service provider unlike the other model specifications they ran.²⁸⁴ We circulated the results of the preferred model specification and other specifications that were run by Economic Insights in consultation on our draft annual benchmarking report. Economic Insights modified the MPFP model specification in light of comments received from stakeholders and produced a report based on these considerations which we had regard to in making our draft determination.²⁸⁵

We released the benchmarking model and underlying data for consultation with our draft determination. We have considered submissions on the model specification, including alternative models that have been developed, and consider that Economic Insights' model specification is the most appropriate. Their model specification has been developed through extensive consultation, drawing on industry knowledge and expertise, economic theory and their econometric experience. The reasons for not adopting alternative model specifications proposed in submissions below.

Outputs, Inputs and operating environment factors

Model specification comprises the input, outputs and operating environment variables relevant to the networks operated by the service providers. In this section we separately outline why their inputs, outputs and operating environment factors are appropriate. Economic Insights sets out its reasoning for its model specification in section 2 of its report.²⁸⁶

Outputs

The outputs that we applied in our Cobb Douglas SFA model are:

- Ratcheted maximum demand
- Customer numbers
- Circuit line length

²⁸² AER, Explanatory statement, expenditure forecast assessment guideline, 2013, November 2013, pp. 141–142.

²⁸³ Economic Insights, Memorandum - DNSP MTFP Results, 2014.

²⁸⁴ Economic Insights, Memorandum - DNSP MTFP Results, 2014.

²⁸⁵ AER, Electricity distribution network service providers Annual benchmarking report, November 2014, p. 47.

²⁸⁶ Economic Insights, 2015, pp. 2–19.

Economic Insights considers that this output specification captures the key elements of service providers' functional outputs that are valued by customers. Also, the ratcheted maximum demand variable introduces an important demand side element to the measurement of system capacity outputs required.²⁸⁷ PEGR applied these variables, as well as energy delivered, in its economic benchmarking analysis undertaken for the Ontario Energy Board.²⁸⁸

This specification has the advantage of incorporating all of a service provider's main outputs. A service provider needs to provide the capacity necessary to meet demand. This capacity output is better captured by the ratcheted maximum demand variable.²⁸⁹ Fixed components of distribution output (such as providing access for each customer) are captured by the customer numbers output. The distance over which service providers have to distribute electricity, and the number of assets required to do so, is likely to be captured by the circuit line length variable.

Inputs

Our benchmarking model only includes one input, which is opex. This is appropriate as the purpose of the model is to consider the efficiency of the service providers in using opex to deliver their outputs.

Operating environment factors

Our opex modelling directly accounts for a number of operating environment factor differences. Economic Insights' model specification directly accounts for the main density factors such as customer density and demand density. This is because, as noted by Economic Insights, customer numbers, line length and ratcheted maximum demand are included as outputs.²⁹⁰

The model specification also accounts for the effect of underground lines by including an operating environment variable for the proportion of underground lines. Underground lines will require less maintenance and no vegetation management. Further, underground lines are less exposed to exogenous factors that may cause network interruptions.

²⁸⁷ Economic Insights, 2015, p. 3.

²⁸⁸ Pacific Economics Group Research, Empirical Research in Support of Incentive Rate Setting in Ontario: Report to the Ontario Energy Board, Report prepared for the Ontario Energy Board, Madison, 2013.

²⁸⁹ An alternative measure to ratcheted maximum demand could be substation capacity. In consultation on the output specification there was some debate as to whether substation capacity or maximum demand should be used. It was noted that, substation capacity would capture the effect of investment in capacity in excess of requirements. We consider that the use of ratcheted peak demand reaches a balance between these two perspectives. Ratcheted maximum demand is the highest level of demand observed over the benchmarking period. As such, it is reflective of the capacity that was required to meet demand over the period.

²⁹⁰ Economic Insights, 2015, pp. 10–11.

To capture the effect of cross country operating environment differences Economic Insights also includes dummy variables for Ontario and New Zealand service providers.²⁹¹

We separately estimated the effect of operating environment factors that could not be directly incorporated into Economic Insights' Cobb Douglas SFA model. Our analysis of these adjustments is detailed in section A.6.

Some of service providers' consultants submit that we should have made adjustments to the data prior to undertaking the modelling for operating environment factors.²⁹² We consider that making ex-post adjustments for operating environment factors, as advised by Economic Insights, is an effective, reasoned and practical approach.

To adjust for operating environment factors prior to modelling we would need to adjust each data point in the sample for the presumed effect of each operating environment factor. This is impractical with the numerous operating environment factors we have considered. To do this would involve considerable judgement regarding the effect of operating environment factors to the 68 service providers in the sample.

Other consultants have argued that we need to directly incorporate more operating environment factors into the model.²⁹³ We consider this approach is inappropriate as:

- only a limited number of variables can be included in economic benchmarking analysis²⁹⁴
- Economic Insights has captured a number of important operating environment factors directly in its model²⁹⁵
- The availability of data on operating environment factors is a constraint on the number of operating environment factors that can be directly incorporated into the model²⁹⁶

Given these points we consider that accounting for operating environment factors not directly incorporated in the modelling through post-model adjustments is a preferable approach. Economic Insights supports this conclusion.²⁹⁷

Proposed alternative approaches are not appropriate

We prefer our benchmarking model specification to alternatives proposed by the service providers. The model specification that Economic Insights has applied is an

²⁹¹ Economic Insights, 2015, p. 14 (section 2.2.4).

²⁹² Frontier, Taking account of heterogeneity between networks when conducting economic benchmarking analysis, February 2015, p. xii. CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, pp. 17–18.

²⁹³ PEG, 2015, pp.52, 54. Huegin, 2015a, p.47.

²⁹⁴ Economic Insights, 2015, p. 12.

²⁹⁵ Economic Insights, 2015, p. 12.

²⁹⁶ Economic Insights, 2015, p. 12.

²⁹⁷ Economic Insights, 2015, p. 18.

appropriate approach to measuring outputs and inputs for Australian distributors in the current context. This specification was developed the model through a rigorous consultation process, and has been informed by industry knowledge, economic theory and econometric expertise. As noted above, the model specification incorporates key service provider functional output variables valued by customers.

A number of submissions have proposed alternative approaches to incorporating outputs, inputs and operating environment factors into our benchmarking modelling.

We consider the alternative specifications proposed by consultants in the sections below.

The inclusion of a variable for lines with a voltage of 132 kV and above

CEPA, PEG and Frontier all include a variable for lines above 66kV in their model.²⁹⁸

As noted by Economic Insights, in the benchmarking data set, only service providers in NSW, Queensland and the ACT have significant lengths of lines above this voltage.²⁹⁹ There is therefore a risk that this variable may pick up other characteristics that are shared by distributors in these states relative to distributors in the other states. This appears to be the case.³⁰⁰

A useful comparison point is the costs that Ausgrid actually allocates to these assets in its regulatory accounts which we have used to develop our operating environment factor adjustment for these assets. Ausgrid reports its costs for 66kV and above assets separately (as they are predominantly classified as dual function assets). In its category analysis RIN AusGrid allocated 7.5 per cent of its opex to 132 kV lines. However:

- CEPA's modelling implies that 31 per cent of AusGrid's opex would be allocated to these assets
- PEG's model implies that 44 per cent of AusGrid's opex would be allocated to these assets
- Frontier's model implies 34 per cent of AusGrid's opex would be allocated to these assets³⁰¹

Incorrect output specification

²⁹⁸ CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, p. 20. PEG, 2014, pp. 22–23.

²⁹⁹ Economic Insights, 2015, p. 48.

PEG uses a sample of Australian and US data to model the efficiency of the US service providers. This data set is different to that applied by Economic Insights which used service providers from New Zealand and Ontario.

However as none of the US service providers have 132 kV line lengths this variable has a similar effect to including the 66kV plus variable in the Australian, Ontario and New Zealand benchmarking models.

³⁰⁰ Economic Insights, 2015, pp. 48–49.

³⁰¹ Economic Insights, 2015, p. 50.

We consider that a number of the alternative models have an incomplete output specification. For instance, CEPA develops a benchmarking model with only one primary output.³⁰² We consider that it is necessary to incorporate several output variables to adequately represent the functional outputs of service providers, and Economic Insights agrees.³⁰³

Huegin run a number of models using the outdated output specifications proposed by the AER and Economic Insights when consulting on the development of benchmarking models.³⁰⁴ However, Huegin did not address the issues identified by Economic Insights when Economic Insights ran these specifications (like the multiplicative nature of the lines and transformer capacity variable).³⁰⁵ These concerns were set out in the memorandum Economic Insights developed on its MTFP benchmarking.³⁰⁶ We consider that these alternative output specifications have been superseded and Economic Insights agrees.³⁰⁷

Incorrect input specification

In a number of instances we have identified issues with the approach taken to incorporate inputs into alternative benchmarking models. We detail these below.

Synergies applies a DEA model with three inputs: opex, MVA of transformer capacity and the user cost of capital of distribution lines (the value used to weight capital inputs under Economic Insights' benchmarking model).³⁰⁸ We consider that the addition of the user cost of capital of distribution lines means that the modelling cannot be used to draw conclusions in regards to opex efficiency.³⁰⁹

McKell's model only models a subset of opex, composed of maintenance, repair, inspection, vegetation management and similar 'upkeep' costs.³¹⁰ The upkeep costs exclude overhead costs.³¹¹ These are a significant proportion of service provider costs. Because costs are excluded from McKell's model it does not measure the efficiency total opex (which also includes overhead costs and service provider operating costs). We prefer Economic Insights' benchmarking modelling because it estimates total opex.³¹² We note that the Energy Supply Association of Australia also notes this limitation of McKell's analysis.³¹³

³⁰² Economic Insights, 2015, pp. 7, 51.

³⁰³ Economic Insights, 2015, pp. 7, 51.

³⁰⁴ Huegin, 2015a, pp. 35–36.

³⁰⁵ Economic Insights, Memorandum – DNSP MTFP results, 2014.

³⁰⁶ Economic Insights, Memorandum – DNSP MTFP results, 2014.

³⁰⁷ Economic Insights, 2015, p. 51.

³⁰⁸ Synergies, 2015, p. 42.

³⁰⁹ Economic Insights, 2015, p. 51.

³¹⁰ The McKell Institute, Nothing to gain, plenty to lose: why the government, households and businesses could end up paying a high price for electricity privatisation, 2014, p. 34.

³¹¹ ESAA, Lies, damn lies and statistics - comparing networks, 2015.

³¹² Economic Insights, 2015, p. 53.

³¹³ ESAA, Lies, damn lies and statistics - comparing networks, 2015.

PEG submits that it is necessary to levelise opex prices across service providers.³¹⁴ By 'levelising' prices, PEG means that we should not use a common opex price index. Instead, PEG submits that we should make allowance for possible different price levels across service providers.³¹⁵

Economic Insights explains that assuming a common annual opex price level and growth rate across service providers provides a more accurate and unbiased approach. This is because the mining boom in Australia has led to a high demand for field staff of the type employed by service providers right across Australia over the last several years. This has had the effect of greatly reducing any pre-existing labour price differences for field staff across the country.³¹⁶

Economic insights also observes that there is inadequate information to levelise Australian service provider opex prices and that PEG's attempts to introduce differences in opex price levels and price growth rates across distributors is likely to create errors.³¹⁷

Data

In this sub-section we explain, in response to the service providers' criticisms, why our data is robust, reliable and used appropriately. First, we explain why we have used international data and our approach to incorporating it. In doing so, we address the approaches proposed by the service providers. Second, we emphasise the comparability of the data we have used. Third, we respond to the service providers' submissions on the quality of the data. Finally, we explain why our approach to conducting post-modelling adjustments is preferable to alternatives put forward by the service providers.

International data

We explained in our draft decision that Economic Insights included international data in the econometric models. Specifically, Economic Insights used databases of service providers from New Zealand and Ontario.³¹⁸ Economic Insights also investigated including data from the US but decided against doing so. This was due to the US data not being of consistent quality, incorporating data from vertically integrated monopolies (which introduces cost allocation issues) and lacking consistent data on variables such as line length and maximum demand.³¹⁹

In response to our draft decision, the service providers and their consultants raised several concerns with Economic Insights' inclusion of international data including:

³¹⁴ PEGR, 2015, p.52 and p.55.

³¹⁵ Economic Insights, 2015, pp. 8–9.

³¹⁶ Economic Insights, 2015, pp. 8–9.

³¹⁷ Economic Insights, 2015, pp. 8–9.

³¹⁸ Economic Insights, 2015, p. 26.

³¹⁹ Economic Insights, 2015, pp. 25–26.

- the model is heavily reliant on overseas data
- overseas data is not comparable with Australian data
- Economic Insights does not adequately account for differences between countries
- Economic Insights' data contains errors.

The first three issues appear to be based on a misunderstanding of how Economic Insights has used the international data. The concerns with data quality are also misplaced. Economic Insights discusses international data in detail in its report in section 3.1. We highlight the key responses below.

Rationale for including international data

As set out in the draft decision, the rationale for Economic Insights incorporating international data into its econometric modelling is not to undertake international benchmarking.³²⁰ Rather, by including these extra data in the sample, Economic Insights can improve the precision of the results for the Australian service providers.

It is necessary to include international data because while the Australian database is robust and reliable for economic benchmarking, it is small. In particular, it shows little time-series variability—a common situation in utilities benchmarking.³²¹ Unlike index-based techniques such as MTFP and MPFP, econometric cost functions require a large number of observations to produce robust results.³²²

Consequently, as Economic Insights explained in its draft decision report, econometric analysis using the Australian-only data set did not produce sufficiently stable results.³²³

After a careful analysis of the economic benchmarking RIN data we concluded that there was insufficient variation in the data set to allow us to reliably estimate even a simple version of an opex cost function model...the time series pattern of the data is quite similar across the 13 DNSPs. Hence, in this case, there is little additional data variation supplied by moving from a cross-sectional data set of 13 observations to a panel data set of 104 observations. As a consequence we are essentially trying to use a data set with 13 observations to estimate a complex econometric model. The 'implicit' degrees of freedom are near zero or even negative in some cases, producing model estimates that are relatively unstable and unreliable.

The lack of time-series variation in the Australian dataset has also affected some models developed by the service providers' consultants. CEPA, for example, acknowledge that it was unable to accurately estimate SFA models robustly and consistently using the Australian only data.³²⁴

³²⁰ Economic Insights, 2015, p. 20.

³²¹ Economic Insights, 2015, pp. 20–21.

³²² Economic Insights, 2015, pp. 20–21.

³²³ Economic Insights (2014), pp. 28-29.

³²⁴ CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, p. 19.

Therefore, to robustly estimate the relationship between opex and outputs using an econometric opex cost function, additional cross-sectional data—that is, more service providers—provides a means of increasing the number of observations. This is an approach PEG agrees with and has indeed undertaken.³²⁵ Economic Insights concluded:³²⁶

...to obtain robust and reliable results from an econometric opex cost function analysis we needed to look to add additional cross sectional observations which meant drawing on overseas data, provided largely comparable DNSP data were available.

By including the NZ and Ontario data, Economic Insights produced econometric results with significantly more accurate parameter estimates. Accurate parameter estimates are essential because they enable more robust opex efficiency comparisons among the Australian distributors.³²⁷ Further, they are important given the results are applied to our trending to forecast output changes and productivity changes. Parameter estimates must be accurate to account for the effect of forecast output change on opex. More precise parameter estimates allow more accurate accounting for output change in forecasts of future opex productivity.³²⁸

Importantly, the efficiency rankings produced by the SFA model with Australian-only data are consistent with the rankings produced by the three-country database. This demonstrates that rather than influencing the results, the international data simply (albeit significantly) increases our confidence in the results.³²⁹

The similarity in Australian service provider rankings using both approaches is discussed below in 'Efficiency results'. It is, therefore, misleading for the service providers to contend that the model is heavily reliant on overseas data.

Approach to incorporating international data

The approach Economic Insights has taken to incorporate international data is to:

- select purpose-built economic benchmarking databases used in recent regulatory decisions which have comparable and consistent data
- explicitly account for jurisdictional differences where possible.

As we explain above, the purpose of this approach is to strengthen the confidence in the results rather than compare Australian service providers to international service providers. For this reason, many of the concerns raised by the service providers' consultants are misplaced.

Purpose-built databases

³²⁵ PEG, 2014, pp. 53-57.

³²⁶ Economic Insights (2014), pp. 28-29.

³²⁷ Economic Insights (2014), p. 31.

³²⁸ Economic Insights, 2015, p. 20.

³²⁹ Economic Insights, 2015, p. 25.

Economic Insights has only used databases with a long history of productivity measurement and which the regulators of the respective jurisdictions have recently used in their determinations. Further, Economic Insights ensured the databases contain similar variable coverage.³³⁰

The New Zealand database, for example, is similar in construction to the Australian database and includes consistent data from 1996 to 2013. The NZCC has used productivity studies for regulatory determinations since 2003 with the most recent (2014) using a similar output and input specification to that used by Economic Insights for this determination.³³¹

Similarly, the Ontario database contains most of the same outputs as the Australian database and includes consistent data from 2002 to 2013. The OEB used this dataset in its most recent determination in 2013, following a study conducted by PEGR.³³²

Economic Insights was, therefore, satisfied that these two databases were appropriate candidates for inclusion. In contrast, upon examination of the US database prepared by PEG, Economic Insights was not satisfied that (among other things) it included enough of the key quantity variables that are fundamental to productivity measurement. Accordingly, Economic Insights did not use this database.³³³

Economic Insights observes that the NZCC and OEB undertook testing and validation of the international databases such that they were comfortable with relying on them for benchmarking in their regulatory determinations. The views of Huegin and Frontier Economics that the data contains errors or that Economic Insights has failed to apply due diligence to the data³³⁴ are, therefore, not convincing.

Accounting for differences

Economic Insights was explicit in identifying differences between the New Zealand and Ontario databases and the Australian database. In particular, Economic Insights made adjustments for:³³⁵

- differences in the composition of the international databases by choosing a dataset that balanced the number of small service providers with the number of possible observations
- possible cross-country differences and inconsistencies in accounting definitions, price measures, regulatory and physical operating environments (such as the impact of harsher winter conditions in Ontario) by using country dummy variables.

³³⁰ Economic Insights (2014), pp. 29-31.

³³¹ Economic Insights (2014), pp. 29-31.

³³² Economic Insights (2014), pp. 29-31.

³³³ Economic Insights (2014), pp. 29-31.

³³⁴ Frontier Economics, (NSW/ACT), 2015, p. vii. Huegin, (NSW), 2015, p.15.

³³⁵ Economic Insights (2014), pp. 29-32.

Limitations in the Ontario database meant Economic Insights included one operating environment variable and no capital input variable. However, Economic Insights was satisfied that these omissions would unlikely significantly influence the results.³³⁶ Subsequent testing of significance levels and monotonicity properties by Economic Insights revealed this to be the case in the three models used in our decision.³³⁷

Despite this approach, one of the key concerns raised by the service providers' consultants is that Economic Insights does not appropriately account for differences between countries. In particular, they do not agree that the dummy variables are adequate.³³⁸

CEPA agrees that the dummy variables control for level differences between databases but considers they do not account for cost relationship differences.³³⁹ Similarly, Frontier Economics and PEG submit that each service provider's costs are influenced by factors not captured by the explanatory variables in Economic Insights' model.³⁴⁰

In response to this, Economic Insights considers for such differences to have a material impact on the model results, significant differences in the technology to distribute electricity would need to exist. Economic Insights notes the international service providers deliver the same services using poles, wires and transformers so it does not agree that such a fundamental difference exists.³⁴¹ Economic Insights is, therefore, confident that the dummy variables are robust and reasonable.³⁴²

Because our objective was not to undertake international benchmarking as such but, rather, to improve the precision of parameter estimates to facilitate opex efficiency measurement across the Australian DNSPs only, there is no need for the coverage of opex in each jurisdiction to be identical nor for operating environment conditions to be identical...

It is hence invalid to interpret the country dummy coefficients as differences in efficiency levels as FE has done or reflections of cost disadvantages as Synergies has done.

A detailed discussion of Economic Insights' approach to incorporating international data is in section 3 of the report attached to this decision.

³³⁶ Economic Insights (2014), p. 32;

³³⁷ Economic Insights was not satisfied, following this testing, that the SFA Translog model was robust or reliable enough to be useful.

³³⁸ PEG, 2015, p. 55; Frontier, (NSW/ACT), pp. 40, 43; Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, p. 17.

³³⁹ CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, p. 17.

³⁴⁰ Frontier, (NSW/ACT), p. 18; PEG, p. 55.

³⁴¹ Economic Insights (2014), p. 14.

³⁴² Economic Insights (2014), p. 17.

Inappropriate alternatives to Economic Insights' use of international data proposed by the service providers

Some of the service providers' consultants have proposed alternative approaches to using international data in the manner Economic Insights has. For example, PEG advocates using US data³⁴³ and others, including Frontier Economics³⁴⁴ and CEPA³⁴⁵ suggest discarding the international data and relying only on Australian data.

As we explain above and Economic Insights addresses in its report, the US database is unusable because the lack of sufficient data fundamental to productivity measurement makes it inconsistent with the Australian database. The alternative of relying only on Australian data is also not feasible due to the lack of time-series variation that may lead to unstable results, which PEG and CEPA recognise.³⁴⁶

Frontier Economics' 'strong' recommendation that we completely discard Economic Insights' model is also not feasible given the NER requirements that we conduct benchmarking.³⁴⁷ Further, for the reasons outlined in this report, we consider that Economic Insights' data and modelling is robust.

Comparability of data

Our draft decision view was that the data we have relied on for economic benchmarking is robust, reliable and comparable.

We collected consistent data from all service providers using the same reporting requirements, following extensive consultation with the service providers and other stakeholders. The RIN requirements allowed some reporting flexibility, including the ability to estimate data if actual data were not available. However, the requirements and definitions were clear. Further, we required the RIN responses to be independently audited and also certified by the service providers' CEOs. Therefore, we were satisfied the data is sufficiently comparable across service providers.

In addition, on the recommendation of Economic Insights, our draft decision adjustments incorporated an allowance in favour of the service providers to allow for potential data and modelling issues:³⁴⁸

[I]t is prudent to adopt a conservative approach to choosing an appropriate benchmark for efficiency comparisons. Adopting a conservative approach allows for general limitations of the models with respect to the specification of outputs and inputs, data imperfections and other uncertainties...

³⁴³ PEG, 2014, pp. 57-63.

³⁴⁴ Frontier, (NSW/ACT), pp. xviii-xix, 100-102.

³⁴⁵ CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, pp. 16-22.

³⁴⁶ PEG, 2015, pp. 53-57; CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, p. 19.

³⁴⁷ Frontier, (NSW/ACT), pp. vii-viii.

³⁴⁸ Economic Insights, 2014, pp. 47-48.

Rather than adopt the frontier DNSP as the benchmark for efficiency comparisons, we are of the view that it would be prudent to instead adopt a weighted average of the efficiency scores in the top quartile of the efficiency score range... This is equivalent to allowing an additional margin on the frontier DNSP's input use of 10 per cent in calculating the benchmark for the NSW/ACT DNSPs ($0.95/1.1 = 0.86$) and is thus a relatively generous allowance.

The service providers raised a number of concerns about the robustness of the Australian data and the comparability of service providers. In particular, submissions considered that:

- Australian service providers are among the largest in the benchmarking sample, especially Essential Energy and Ergon Energy³⁴⁹
- many variables in the economic benchmarking RIN were not provided by service providers on a consistent basis³⁵⁰
- we have not taken into account certain differences between services providers, including related party arrangements.³⁵¹

Relative size of service providers

With reference to the appropriateness of international service providers, several consultant reports consider that the Australian service providers are disadvantaged because they have some of the longest circuit lengths in the benchmarking sample. They consider Essential Energy and Ergon Energy are particularly disadvantaged because they have the longest circuit length and the lowest customer density of all service providers.³⁵² They also noted that Ausgrid and Energex have a high customer numbers and ratcheted maximum demand relative to the sample average.

We disagree that the size of the Australian service providers are not a comparative disadvantage to other providers in the sample.

Rural providers with very low customer density

Economic Insights considers that the long circuit length of Essential Energy and Ergon Energy does not underestimate their efficiency. Economic Insights states that if Essential Energy and Ergon Energy were genuine outliers, it would expect the flexible translog function to give them much higher efficiency scores than the less flexible Cobb Douglas function. The results, however, are very similar.³⁵³

³⁴⁹ Frontier Economics, (NSW/ACT) 2015, pp. 25–31. Synergies, (Ergon) 2015, pp. 4–5; Huegin, (NSW), 2015, pp.58–59.

³⁵⁰ PwC, Jan 2015, pp. 24-32.

³⁵¹ PwC, Jan 2015, pp. 33-37.

³⁵² Frontier Economics, (NSW/ACT) 2015, pp. 25–31. Synergies, (Ergon) 2015, pp. 4–5; Huegin, (NSW), 2015, pp.58–59.

³⁵³ Economic Insights, 2015, p. 30.

Economic Insights acknowledges that it would be desirable to have more 'large' rural providers in the sample, but considers these two service providers are unusual with no service providers in comparable countries with accessible data having the same extent of lines.³⁵⁴ Economic Insights did not consider there was justification to adjust Essential Energy's and Ergon Energy's efficiency scores on the basis of their very low customer density.

While comforted by Economic Insights' reasoning, we also engaged EMCa to consider whether—from an engineering perspective—the relationship between opex and customer density changes at the very low densities of Essential Energy and Ergon Energy. EMCa found it is feasible to compare sparse rural distributors (like Essential Energy and Ergon) with other rural distributors included in the benchmarking data set.³⁵⁵ As such, the findings for our benchmarking model are applicable to the sparse rural service providers.

In any event, the service providers used to derive the benchmark frontier (that we compared Essential Energy to in the draft decision) contains three rural providers—Powercor, SA Power Networks and AusNet Services. Further, we have changed the benchmark comparison point to AusNet services, who is at the bottom of the top quartile of observed scores, which means we have given more weight to (among other things) the characteristics of these rural providers. In our view, this significantly mitigates any perceived disadvantage Essential Energy and Ergon Energy face due to their low customer density.

Customer numbers and demand

While Ausgrid and Energex may have high customer numbers and ratcheted maximum demand relative to the sample average, we do not consider they are comparatively disadvantaged. Economic Insights advises that there are sufficient comparably sized service providers to conclude that Ausgrid and Energex are not significantly distant from other observations such that they would be considered outliers.³⁵⁶

The consistent results of the benchmarking models, including consistency with the MPFP model (which does not include the international data) provides comfort that Ausgrid and Energex are sufficiently comparable to other service providers in the sample.

Consistency of variables

Some submissions considered that service providers may not have provided several variables in the economic benchmarking RIN on a consistent basis.³⁵⁷ We do not consider these concerns are valid, or are sufficiently significant for us to not to conduct benchmarking. Economic Insights, as an economic benchmarking expert, is well

³⁵⁴ Economic Insights (2015), p. 30 (section 3.3).

³⁵⁵ EMCA, 2015, p. 1.

³⁵⁶ Economic Insights, 2015, p. 30.

³⁵⁷ PwC, Jan 2015, pp. 24-32.

qualified to form an opinion on the appropriateness of data for economic benchmarking. As we explained in our draft decision, Economic Insights considered the Australian database to be robust and suitable for economic benchmarking.³⁵⁸

Given the extensive process that has been gone through in forming the AER's economic benchmarking RIN database to ensure maximum consistency and comparability both across DNSPs and over time, the database is fit for the purpose of undertaking economic benchmarking to assess DNSP opex efficiency levels and to estimate models that can be used to forecast future opex partial productivity growth rates.

The econometric models require only six aggregate variables from the service providers to function effectively (network services opex, energy delivered, customer numbers, ratcheted maximum demand, circuit length and proportion of underground cables). Many submissions on data comparability do not actually relate to these variables. Accordingly, we consider concerns raised about the following matters are not relevant to our findings:

- RAB values³⁵⁹ – these are not included in the opex modelling
- differences in opex category reporting, including treatment of metering costs – Economic Insights' model's use total network services opex, which excludes metering
- revenue data – our benchmarking models do not rely on revenue
- route line length – we have not used route line length in the opex models³⁶⁰
- inconsistency in energy density and customer density calculations – these measures are not central to our analysis but, in any case, we rely on our own calculations, which are on a consistent basis
- system and operating model changes – the aggregate nature of the required variables and our precise definitions for these variables mitigate the impact of such changes
- weather adjusted maximum demand – we do not use this data

³⁵⁸ Economic Insights, 2014, p. 3.

³⁵⁹ RAB data is relevant to our MTFP model and opex MPFP model. We use RAB data to weight the volume of inputs and outputs. However, because MTFP is an index-based benchmarking method, the outcomes of the MTFP model will be less sensitive to the weighting of inputs than they will be to the amounts of the inputs themselves. Therefore, any purported comparability concerns with RAB data will have only a very minimal impact on the MTFP results. Economic Insights, 2015.

³⁶⁰ We have used route line length normalise the results of our PPIs. However, we consider that discrepancies in the measurement of route line length will not affect the conclusions of this analysis. The large differences in customer density in these models are not likely to be impacted by slight inaccuracies in the estimates of route line length. In addition, as part of our testing and validation process, we identified and adjusted for the issue with UED's route line length identified by PwC. We circulated this data set to all service providers with our draft economic benchmarking report and published this data set on our website with our draft determination.

To the extent that PwC and EY submit that circuit length the data is not appropriate for use in benchmarking because some service providers have estimated it, we consider:³⁶¹

- As we explain below, neither PwC nor EY demonstrate that the data is not suitable.
- we consider that the estimates are reasonable because the service providers are the best placed to estimate their own asset characteristics and their CEOs have certified they are the best estimates the service provider can provide
- where estimated circuit length may vary from actual circuit length, we would be concerned if service providers were able only to estimate a value—of core assets they manage—that deviated from reality to the point where it would result in a material difference to their benchmarking performance.

Differences between service providers

Some submissions raise comparability matters that are relevant to our opex modelling.³⁶² However, we have taken these into account in our draft and final decisions:

- differences in capitalisation policies and cost allocation methods – we considered these as part of our operating environment factor assessment and made an adjustment if we considered one was warranted³⁶³
- differences in vegetation management clearance requirements between states – we considered this as part of our operating environment factor assessment and made an adjustment if we considered one was warranted³⁶⁴
- differences in network age, service quality and reliability standards – we considered these as part of our operating environment factor assessment and made an adjustment if we considered one was warranted³⁶⁵
- related party arrangements – considered as part of our examination of opex factors. We considered ownership arrangements are not a key concern for total opex assessment because benchmarking enables us to compare the relative efficiency of each service provider's opex regardless of the arrangements they have in place (which are the service provider's choice)³⁶⁶
- provision reporting – service providers must develop their provision accounts in accordance with consistent Australian accounting standards so they must meet the same requirements even if they may be named differently. Further, opex reported on a cash basis and accrual basis to be approximately equal on average.³⁶⁷ Hence

³⁶¹ PwC, Jan 2015, 2015, p. 31. EY, Briefing Paper: RIN Data Review Ergon Energy, 13 February 2015, pp. 6–7.

³⁶² PwC, Jan 2015, pp. 33-37.

³⁶³ AER, Draft decision – attachment 7, section A.5.

³⁶⁴ AER, Draft decision – attachment 7, section A.5.

³⁶⁵ AER, Draft decision – attachment 7, section A.5.

³⁶⁶ AER, Draft decision – attachment 7, p. 7-24.

³⁶⁷ Economic Insights, 2015, p. 56.

the use of eight years of panel data to derive an average efficiency score for the period will reduce the effect that provisions could have on the benchmarking results.

In our draft decision, we did not explicitly consider differences in the allocation of responsibility for vegetation management across states or differences in fuel mix. In this final decision, however, we consider them as part of our operating environment factor assessment in section A.6.

Data quality

The service providers and their consultants submitted they had some concerns regarding the quality of benchmarking data we have used.³⁶⁸ We disagree with their submissions and maintain our draft decision view that our dataset is of good quality. As we mentioned above, Economic Insights considers our dataset is robust:

While no dataset will likely ever be perfect, the AER's economic benchmarking RIN data provides the most consistent and thoroughly examined DNSP dataset yet assembled in Australia... the AER's economic benchmarking RIN data are also considerably more detailed, comprehensive and consistent than regulatory data in comparable countries, including the United States. The Australian output and input data used in this study are thus considered to be quite robust and to compare more than favourably with overseas datasets used in previous studies.

PEG also submits that our dataset is "generally of good quality".³⁶⁹ The CCP also praised the data, noting that it was supplied by the distributors.³⁷⁰ Further, Jemena Gas Networks, and AusNet Services (Gas) have recently asked us to rely on their gas data after submitting benchmarking models prepared by Economic Insights.³⁷¹ The data they have relied on has not been subject to the same rigorous testing and validation process that the economic benchmarking RIN data has been subject to.

In this sub-section we briefly reiterate our data collection and validation process before addressing previous comments regarding data quality and explaining why alternatives proposed by the service providers are unreasonable.

³⁶⁸ Essential Energy, Revised revenue proposal, 2015, p. 189; Endeavour Energy, Revised regulatory proposal, 2015, p. 169; Ausgrid, Revised regulatory proposal, 2015, p. 130; ActewAGL, Revised regulatory proposal, 2015, p. 83; CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015.

³⁶⁹ PEGR, 2014, p. 30.

³⁷⁰ CCP, Responding to NSW draft determinations and revised proposals from electricity distribution networks, 2015, p. 50.

³⁷¹ Economic Insights, The Productivity Performance of Jemena Gas Networks' NSW Gas Distribution System Jemena Gas Networks (NSW) – Access Arrangement Information – Appendix 6.7, August 2009
Economic Insights, 2013-2017 Gas Access Arrangement Review – Access Arrangement Information Appendix 6B, 2012.

Data collection and validation process

The development of our benchmarking dataset has come about as the result of a public consultation process that began May 2012. We presented the full process we went through to collect, test and validate the data in our approach section. This process included several open workshops to discuss data requirements and four explicit opportunities for service providers to comment on the data prior to submitting unaudited RIN responses.³⁷²

Following this process, and before requiring audited RIN responses, we initiated a comprehensive testing and validation process involving:

- comparing RIN information with information previously reported by service providers (such as regulatory proposals, previous RIN responses and distributor annual reports) to ensure consistency
- reviewing time series data to identify any anomalous data points
- reviewing bases of preparation to ensure the service providers prepared the data in accordance with the RIN instructions and definitions
- comparing data across service providers to identify potential anomalies.

Where we identified anomalies or inconsistencies we drew these to the attention of the service providers. Ultimately, to ensure that the data was reliable we required independent audit of the service providers' RIN responses prior to final submission and the service providers' CEOs to sign a statutory declaration attesting to the robustness of the data.

We then published the audited RIN data on our website and called for submissions on the data.³⁷³ In response, only CitiPower and Powercor raised specific issues regarding data quality, which we addressed.³⁷⁴ We subsequently undertook further review of audited RIN responses and discussed any further data issues directly with the relevant service providers.

When we consulted on our draft benchmarking reports in August 2014, we again circulated our benchmarking data set. In this process, Energex raised the only significant data-related issue, relating to the inclusion of feed-in tariffs. To account for this submission we excluded the value of feed in tariffs from opex.³⁷⁵

³⁷² We circulated, for comment, (1) preliminary EB RIN templates (2) revised preliminary RIN templates (3) draft RIN templates (4) draft expenditure forecast assessment guidelines.

³⁷³ We did not only publish the data, but we also published the basis of preparation of each of the service providers of the data. The basis of preparation describes how the service providers completed the templates.

³⁷⁴ CitiPower and Powercor, Publication Of The Economic Benchmarking RIN, June 2014. CitiPower and Powercor commented on differences in the calculation of MVA capacity of lines across the service providers. They recommended that "The AER sensitivity test the impact on the benchmarking results by applying standard capacity values across different DNSPs". In response to this comment we undertook sensitivity tests of the data. Submissions are on our website at: <http://www.aer.gov.au/node/25078>.

³⁷⁵ Energex's submission is on our website at: <http://www.aer.gov.au/node/25078>.

In the course of our testing and validation process, we found that some responses for certain variables (particularly for several operating environment variables) were not robust. Accordingly, we decided not to use these variables.

We are not professing that our benchmarking dataset is perfect. However, Economic Insights considers no dataset is ever likely to be perfect (Frontier Economics agrees³⁷⁶), and ours is suitable for benchmarking.³⁷⁷ We are satisfied that we have undertaken a very comprehensive and inclusive process to develop a database that is sufficiently robust and reliable for benchmarking purposes.

Further, the data that we have used in our benchmarking models is aggregate data that the service providers themselves require for their own purposes. This data includes historic opex, reliability, demand, customers and the number and size or capacity of key assets. The customer numbers we use, for example, are the number of National Metering Identifiers that the service providers must submit to AEMO for settlement purposes.

Without reliable information on the quantity, location, nature and condition of their networks and assets, service providers would be unable to effectively (or safely) operate and maintain their networks. We also comment that the data produced in the economic benchmarking RINs is derived from the same systems the service providers use to prepare their regulatory proposals, which they use to justify increases in revenue.

Previous comments on data quality

The service providers point to past comments the AER/ACCC, AEMC, PC and Economic Insights have made about benchmarking data as a reason why they consider our current benchmarking data is not robust.³⁷⁸ The submissions highlight:³⁷⁹

- the AER's 2008 opinion that it did not have robust, consistent and reliable long term data suitable for TFP
- Economic Insights' 2009 view that the regulatory data available at the time were not fit for the purpose of a robust TFP analysis of the standard required to base regulatory pricing and revenue determinations on
- the AEMC's decision in 2011 not to adopt TFP for price and revenue determinations
- the PC's conclusion in April 2013 that there was little immediate scope for benchmarking to play a decisive role in determinations due to its incipiency.

³⁷⁶ Frontier, (NSW/ACT), p. 101.

³⁷⁷ Economic Insights, 2014, p. 3.

³⁷⁸ ActewAGL, Revised Regulatory Proposal, pp. 125-134, attachment C12; Ausgrid, Revised Regulatory Proposal, pp. 130-142.

³⁷⁹ ActewAGL, Revised Regulatory Proposal, pp. 125-134, attachment C12; Ausgrid, Revised Regulatory Proposal, pp. 130-142.

Some service providers raised similar concerns during the development of our economic benchmarking RIN, in September 2013, also referring to the AEMC's TFP review. In that process, we explained that the AEMC's comments about data availability and quality related to data in the public domain or used in previous regulatory decisions.³⁸⁰

The same applies here. All of the above statements relate to data existing in the public domain or used in determinations at the time (that is, prior to April 2013). We collected the data we are using in this determination at the end of April in 2014.

Given the aforementioned positive comments about our *current* benchmarking data, we are not convinced that the service providers' submissions have merit.

Alternative approaches proposed by service providers

On behalf of the service providers, Frontier Economics considers we should spend more time collecting 'more consistent and reliable data across distributors and work collaboratively with the service providers. In doing so, Frontier Economics observes that Ofgem has undertaken a decade or more of development work in respect of its data collection.³⁸¹ CEPA also comments that if we had consistent data across the Australian service providers we may not need to rely on international data.³⁸²

Notwithstanding our view that our data is of good quality now, this alternative is not feasible. Econometric benchmarking analysis with Australian service providers can only be conducted with the international data. This is due to the cross-sectional variation issue we discuss above. As PEG observes, the number of companies in the Australian sample will always be limited, even as additional years of data accumulate.³⁸³

As for Frontier Economics' observations of Ofgem, we note the following. According to CEPA, in its 1999 price review for distribution services Ofgem benchmarked operating expenditure. It did so with only one year of opex data that required a number of significant adjustments. Using this data Ofgem developed a simple benchmarking model with only one dependent variable and determined the UK service providers could reduce their opex by 16 per cent (on average). The service providers subsequently were able to reduce their opex by 20 per cent (on average).³⁸⁴

We do not consider that Ofgem's approach was perfect. It does, however, indicate that Ofgem has in previously implemented opex benchmarking using a less sophisticated and less rigorously tested database than our own to determine expenditure requirements.

³⁸⁰ AER, Draft RIN for economic benchmarking—explanatory statement, September 2013, pp. 16-17.

³⁸¹ Frontier, (NSW/ACT), pp. 102-103.

³⁸² C3 - CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (ActewAGL), p. 54-55.

³⁸³ PEG, 2015, p. 65.

³⁸⁴ CEPA, Background to work on assessing efficiency for the 2005 distribution price control review, 2003, pp.43-44, 54.

Adjustments to data

CEPA submits that our approach of adjusting for identified operating environment factors not explicitly included in the econometric models is 'not in line with the approach used by Ofgem'. CEPA's view is that a better approach is to adjust for operating environment differences prior to conducting the modelling.³⁸⁵

Economic Insights disagrees that the post-modelling adjustment approach is inappropriate. Economic Insights considers that given the purpose of the study, adjustment for operating environment factors can be done either.³⁸⁶

- as part of the modelling, if sufficient information is available for all included service providers across all jurisdictions, or
- after the modelling if data for particular variables are not universally and consistently available across countries, but are available for Australian distributors.

Economic Insights has adopted the latter approach because—given we are comparing Australian service provider performance to the most efficient Australian providers—the requisite information is not available for all service providers across all jurisdictions.

Economic Insights also notes that degrees of freedom considerations limit the number of operating environment variables that can usefully be included directly in economic benchmarking models. This means that making the use of subsequent adjustment is the only way of allowing a fuller treatment of operating environment factors. Therefore, while Economic Insights' approach may be different to that adopted by Ofgem, it is a valid approach and one that makes optimal use of the information available.³⁸⁷ By adopting the two step approach analysis includes allowance for the impact of many more operating environment factors than have earlier economic benchmarking studies and the alternative models advanced by the distributors' consultants.³⁸⁸

We discuss operating environment factors in detail in section A.6.

Estimation methods

In this sub-section we compare and contrast our estimation methods with the alternatives proposed by the service providers' consultants. First, we explain what we have done and why. Second, we explain why we have not used data envelopment analysis (DEA) and why the DEA analysis used by the service providers' consultants is inappropriate. Third, we demonstrate why the service providers' estimation methods are not robust or reliable.

³⁸⁵ CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, p.18.

³⁸⁶ Economic Insights, 2015, p. 18.

³⁸⁷ Economic Insights, 2015, p. 18.

³⁸⁸ Economic Insights, 2015, pp. 18–19.

Our estimation methods

We have applied the best available model for estimating efficient opex. Economic Insights explains that our Cobb Douglas SFA model is statistically superior to other benchmarking methods for the following reasons:³⁸⁹

- it specifies the relationship between opex and outputs and some operating environment factors in an opex cost function (unlike DEA and MPFP)
- it directly estimates an efficient frontier (unlike econometric models and MPFP)
- it contains a random error term that separates the effect of data noises or random errors from inefficiency (unlike econometric models, DEA and MPFP)
- the results of the Cobb Douglas SFA model can be verified with statistical testing (unlike DEA and MPFP).

In addition, Economic Insights undertook tests of the Cobb Douglas SFA model and have found that:³⁹⁰

- all the parameters are of the expected sign
- the parameter estimates all have plausible values
- estimated coefficients are statistically significant which indicates that they have been estimated to a high degree of precision
- the confidence intervals for the efficiency scores are relatively narrow.

We have further confidence that the Cobb Douglas SFA model is appropriate because Economic Insights has also been able to corroborate the SFA model by producing consistent results using:

- other sophisticated econometric opex models using the same set of explanatory variables (Cobb Douglas LSE and translog LSE) that are more appropriate than the alternatives proposed by the service providers
- the opex MPFP model, which applies a slightly different model specification and does not rely on international data.

In addition, the results of our partial performance indicators and detailed review are consistent with the economic benchmarking results.

Data envelopment analysis

Some submissions suggested we should use DEA because we foreshadowed we would use it in our Guideline. However, we have chosen not to apply DEA because it is an inferior modelling technique to a SFA model.

³⁸⁹ Economic Insights, 2014, pp. 7–8.

³⁹⁰ Economic Insights, 2014, pp. 31–34.

As Economic Insights observes, DEA may identify certain service providers as efficient by default.³⁹¹ This is because DEA estimates the efficient frontier based upon the observed input and output combinations of service providers. This problem is compounded with the inclusion of additional output variables.³⁹² This is a particular concern when DEA is applied to a small sample of service providers (such as the Australian only data set).³⁹³

In addition, DEA models do not produce confidence intervals for efficiency estimates and DEA requires a large number of observations to be implemented satisfactorily.³⁹⁴ Economic Insights considers that SFA is a preferable form of econometric model because it separates out the inefficiency component from the random noise component of the error term.³⁹⁵

In our Guideline we indicated that we would use DEA. However, we also specified that we would take a holistic approach to developing benchmarking models based upon the availability of data. Once we received benchmarking data we discovered that we were able to develop a statistically superior SFA model. As such, we have decided to depart from the approach we set out in the Guideline.

The service providers' estimation methods are not sufficiently robust or reliable

A number of consultancy reports submitted have presented alternative benchmarking models to cross-check opex cost modelling by Economic Insights.³⁹⁶ Depending on the model specification, these estimation methods differ in how they estimate inefficiencies, unobserved firm heterogeneity effect, and random errors. The modelling differences include:

- treatment of unobserved firm heterogeneity and its separation from inefficiency
- the distributional form applied to modelled inefficiency
- The inclusion or exclusion of a random error term and the characteristics of this random error term.

The results of these models differ to that of Economic Insights. In our view, this is because the alternative models presented by the service providers' consultants are not robust. We outline our views on the alternative models below.

³⁹¹ Economic Insights, 2015, p. 41.

³⁹² Economic Insights, 2015, p. 41.

³⁹³ Economic Insights, 2015, p. 41.

³⁹⁴ Economic Insights, 2015, p. 41.

³⁹⁵ Economic Insights, 2015, p. 41.

³⁹⁶ Huegin, 2015(a,b), Frontier, 2015(a,b), Synergies, 2015b.

Use of DEA

A number of the service providers' consultants have chosen to develop DEA models. We have noted the limitations of DEA models above.

For instance, Huegin, Synergies and Frontier apply DEA models using a variety of inputs and outputs.³⁹⁷ Frontier Economics finds more service providers to be efficient when additional output variables are added to the model or variable returns-to-scale technology is imposed. This illustrates the 'efficient by default' problem when using DEA. Economic Insights notes that increasing the number of outputs from three to four increases the number of distributors with scores above 0.95 from two to seven, while also introducing variable returns to scale further increases the number with scores above 0.95 to 10 – simply because the sample is not large enough to support sensible efficiency analysis using this method.³⁹⁸

True fixed-effects (FE) model and true random-effects (RE) models

Frontier Economics developed FE and RE models. These models assume inefficiency varies randomly over time.³⁹⁹ Consequently they attribute inefficiency that does not vary over time to latent heterogeneity.⁴⁰⁰ This is an incorrect assumption where inefficiency persists over time as these models will systematically underestimate inefficiency where inefficiency persists over time. Economic Insights notes that these models find very large mean efficiency scores which it considers would appear to be unreasonably high given what is known about the relative performance of firms in this sample from other sources.⁴⁰¹ Economic Insights also notes that, to its knowledge, these models have not been applied by any regulator in any country due to the inherent problems with the underlying assumptions in the models.⁴⁰²

Latent class modelling and k-means clustering

Huegin, in their report for the NSW and ACT service providers, use latent class SFA models to identify heterogeneity in the dataset.⁴⁰³ In this methodology, clustering methods are used to identify subsets of the sample data so that separate efficiency frontiers can be estimated for each subset. Huegin's modelling is flawed, however, because:

- Huegin did not include country dummy variables in its modelling to capture cross country differences.⁴⁰⁴

³⁹⁷ Huegin, 2015a, Synergies.

³⁹⁸ Economic Insights, 2015, p. 41.

³⁹⁹ Economic Insights, 2015, p. 33.

⁴⁰⁰ Economic Insights, 2015, p. 34.

⁴⁰¹ Economic Insights, 2015, p. 34.

⁴⁰² Economic Insights, 2015, p. 34.

⁴⁰³ Huegin, (NSW/ACT), 2015, p. 56.

⁴⁰⁴ Economic Insights, 2015, p. 38.

- Huegin did not report parameter estimates for the model. When parameter estimates were later provided on request, some of the estimated coefficients had the incorrect signs⁴⁰⁵
- Latent class modelling will understate inefficiency because dividing any data set into subsets the mean efficiency score will almost invariably increase as the sample size decreases.⁴⁰⁶

In their subsequent report for Ergon Energy Huegin apply a different statistical technique, k-means clustering. This is used to look for clusters (classes) in Economic Insights's data set.⁴⁰⁷ This approach has the following problems:⁴⁰⁸

- the Huegin clustering exercise involves a simple comparison of means, which is a linear analysis. The Economic Insights (2014) models are non-linear economic cost function models (Cobb-Douglas and translog) which are used to capture the classic diminishing marginal returns nature of economic cost structures.
- Huegin exclude the country-level dummy variables from the analysis, which introduces misspecification.
- The clustering methods identify clusters of service providers that are similar to each other in terms of closeness of their means. They do not provide evidence that the service providers in these clusters are significantly different from each other nor that they belong to separate cost functions.

Efficiency results

In this sub-section we address the robustness and reliability of our approach, in light of the results of the service providers' alternative models. The service providers, their consultants and the McKell Institute submit that our benchmarking results are sensitive to the modelling approach and model specification adopted. They present alternatives to demonstrate this. They consider the extent of the variation in outcomes indicates the poor explanatory power of our benchmarking as a proxy for the real operating costs of the service providers.⁴⁰⁹

We agree that different modelling techniques and model specifications will produce different results. However, as we demonstrated above, Economic Insights' modelling is robust whereas the alternatives developed by the consultants of the service providers

⁴⁰⁵ Economic Insights, 2015, p. 39.

⁴⁰⁶ Economic Insights, 2015, p. 39.

⁴⁰⁷ Huegin, (Ergon), 2015.

⁴⁰⁸ Economic Insights, 2015, p. 39.

⁴⁰⁹ ActewAGL, RRP, 2015. p.151 p. 175. Essential, RRP, 2015, p. 182. AusGrid, RRP, 2015, p. 143. Huegin, (NSW/ACT), 2015, pp. 11-19. ActewAGL, RRP, 2015, p.131-132, p. 149; CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, pp. 23-32; PEG, 2015, pp. 55-56; Huegin, (Ergon) 2015, pp. 35-36; Synergies, 2015 ; Frontier Economics, (NSW/ACT), 2015; McKell Institute, 2015 .

are not. Economic Insights has considered the alternative models proposed by the service providers' consultants in detail and has identified significant deficiencies.⁴¹⁰

Our results are robust and reliable

Our view is that the results of Economic Insights' modelling are robust and reliable because the model specification, data and estimation methods are superior to everything proposed by the service providers and their consultants. The CCP agree that the model is robust and reliable.⁴¹¹

Our assessment is that the work is thorough, and that care has been taken in choosing appropriate models, testing them and defining their limitations including the standard errors of their estimates. We find the consistency of its partial slope coefficients (across models) and the narrowness of its standard errors reassuring. The explanatory factors that the model has chosen are consistent with those we have seen in other modelling exercises...and the ordinary least squares and least square dummy variable approaches are well accepted.

Model specification

As we outline above, Economic Insights' model specification, in combination with a subsequent adjustment for operating environment factors, is appropriate because:

- it is informed by economic theory, engineering knowledge and industry expertise
- the inputs to the model reflect the key functions of service providers and the outputs reflect what is valued by customers
- the ex post operating environment factor adjustment involves a thorough assessment of potential differences between the service provider in question and the frontier service providers.

In contrast, the alternative model specifications presented by the service providers' consultants seem to have little regard for the ultimate purpose of the benchmarking exercise. This is to, as accurately as possible, determine the efficiency of opex by examining the relationship between inputs and outputs. The service providers' alternative models either:

- Include a variable to capture the cost of lines above 66 kV that picks up other effects and leads to efficiency gaps being understated⁴¹²
- do not cover key functional outputs—CEPA, for example, presents a function with only one or two outputs, which is not adequate to accurately model service provider cost characteristics⁴¹³

⁴¹⁰ Economic Insights, 2015, p. 53.

⁴¹¹ CCP, p. 51.

⁴¹² Economic Insights (2015), pp. v-vi.

⁴¹³ Economic Insights (2015), pp. 51.

- inappropriately measure inputs, such as Synergies use of input variables other than opex and PEGR's levelisation of opex prices.⁴¹⁴

⁴¹⁴ Economic Insights (2015), p. 51.

Data

As explained above, the data we have used is robust because:

- we developed the Australian dataset in consultation with the service providers and then conducted extensive testing and validation to ensure the variables relevant to the benchmarking models were reliable and fit for purpose
- the international datasets we use to improve the precision of the Australian efficiency results:
 - are used for economic benchmarking purposes by the regulators in the respective jurisdictions (OEB and NZCC)
 - contain sufficiently comparable service provider information for the purpose of enhancing the precision of the modelling results
 - have been in place in the mid–1990s and have been used in economic benchmarking since the early 2000s.

Conversely, the service providers seek to:

- either rely only on the Australian data, which does not produce stable results due to the lack of cross-sectional variation or
- include US data in the sample, which Economic Insights has demonstrated is not fit for purpose.

Estimation methods

Our use of Economic Insights modelling is appropriate as Economic Insights has applied the best available model for estimating efficient opex. They have chosen appropriate estimation methods that produce robust and reliable results for benchmarking opex. Economic Insights' Cobb Douglas SFA model is statistically superior to other benchmarking methods because it can (among other things) estimate the efficient frontier. Further the Cobb Douglas SFA model has a random error term that separates the effect of data noises or random errors from inefficiency.⁴¹⁵

Economic Insights has also been able to corroborate the SFA model by producing consistent results using:

- other sophisticated econometric opex models using the same set of explanatory variables (Cobb Douglas LSE and translog LSE) that are more robust than the alternatives proposed by the service providers
- the opex MPFP model, which applies a different model specification and does not rely on international data.

⁴¹⁵ Economic Insights, 2014, p. 7.

In addition, the results of our partial performance indicators and detailed review are consistent with the economic benchmarking results.

On the other hand, the service providers and their consultants have presented alternative estimation methods that Economic Insights has demonstrated are not robust because of the assumptions that underlie the modelling or the limited data set used.

Modelling results

We highlight in our discussion on international data, the importance of understanding how and why Economic Insights has used international data. Economic Insights is not using the international data to compare the absolute levels of opex between Australian service providers and their overseas peers. Rather, the purpose is to improve the precision of parameter estimates to facilitate opex efficiency measurement across the Australian distributors only.⁴¹⁶

Ultimately, this means it is possible to compare efficiency scores within each jurisdiction but not across jurisdictions. The service providers' consultants have misunderstood this distinction, so the following observations and criticisms are not valid or compatible with Economic Insights' modelling approach:⁴¹⁷

- reference to an Ontario firm as being the 'frontier' or 'best performing' firm⁴¹⁸
- comparisons of raw efficiency scores across countries⁴¹⁹
- attempting to interpret country dummy variables as reflecting the extent to which an Australian service provider would need to have lower opex than a New Zealand or Ontario service providers to be 'fully efficient'⁴²⁰
- the need for reporting or operating environment 'standardisation' across countries⁴²¹
- the need to include additional country dummy variables to allow for differences in exogenous variable coefficients across countries.⁴²²

Further, Economic Insights also demonstrates that the Ontario or New Zealand data are not 'driving the results' of the Cobb Douglas SFA model as is submitted by a number of the service providers consultants.⁴²³

⁴¹⁶ Economic Insights (2015), pp. 25-27 (section 3.2.1).

⁴¹⁷ Economic Insights (2015), pp. 25-27 (section 3.2.1).

⁴¹⁸ FE (2015a, p.12); Huegin (2015a, p.26).

⁴¹⁹ FE (2015a, p.17); Synergies (2015b, p.36).

⁴²⁰ FE (2015a, p.16); Synergies (2015b, p.37).

⁴²¹ PEG (2015, p.53), Synergies (2015b, pp.33–34) and FE (2015a, p.x); Benchmarking and setting efficiency targets for the Australian DNSPs, (ActewAGL), pp.16-18.

⁴²² FE (2015a, pp.24–25).

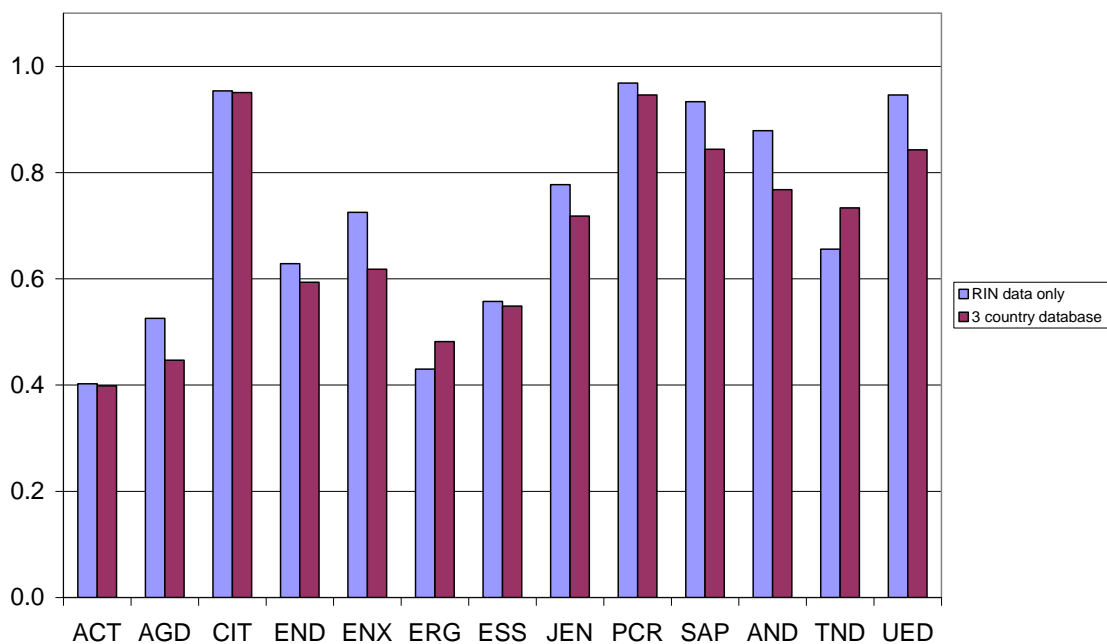
⁴²³ Economic Insights, 2015, pp. 23–25.

Economic Insights is also clear that it is difficult to produce stable and reliable results with the Australian data on its own:⁴²⁴

[It] is important to recognise that the characteristics of the Australian RIN data make any econometric model estimated using only the RIN data insufficiently robust to support regulatory decisions.

However, we can demonstrate that the robust Australian efficiency results that utilise the international data are very similar to the efficiency results using the Australian data alone. Figure A.6 compares the two and proves that the international data is not driving the results of the model.

Figure A.6 Modelling results – all data and Australian only data



Source: Economic Insights, 2015

Different results to Ontario

A number of the consultants' reports submit that the efficiency results for the Ontario service providers differ markedly between those derived from (but not presented) in Economic Insights' 2014 report and those presented by PEG in 2013 and subsequently used by the Ontario Energy Board.⁴²⁵

Economic Insights notes that it is not surprising that the two sets of efficiency score rankings differ because Economic Insights' relate to *opex* efficiency while PEG's relate

⁴²⁴ PEG, 2015, pp. 65–66; Frontier Economics, (NSW/ACT), 2015, p.xi. CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, pp.16–18. Huegin, Ergon 2015, pp.13,15. Economic Insights (2015), p. 21.

⁴²⁵ For example, Huegin (2015a,c) and FE (2015a).

to *total* cost efficiency. The reason different efficiency measures were used in the two studies reflects the fundamentally different regulatory regimes – Australia uses building blocks regulation with its separate examinations of opex and capex whereas Ontario uses productivity-based regulation which focuses on total costs.⁴²⁶

Results from alternative modelling are not robust

Economic Insights has considered the alternative models presented by the service providers' consultants in detail and has serious flaws. These are as follows:⁴²⁷

1. The Australian data has inadequate variation to support robust model estimation where it is the only data source used and where tests for parameter differences across countries are made
2. Use of a 132kV line variable inadvertently picks up other effects and leads to efficiency gaps being understated
3. Latent heterogeneity models incorrectly allocate persistent inefficiency effects to operating environment differences
4. Inadequate observation numbers lead to some models misleadingly finding service providers to be 'efficient by default'
5. Some output and input specifications are inadequate and/or not relevant
6. Other overseas data sources unduly limit the range of variables and number of comparators that can be included

The issues identified with each of the service provider's consultant's models are set out in Table A.4.

Table A.4 Problems identified with service providers' consultants' models

Consultancy report reviewed	Data	Benchmarking method	Model specification	Main issues identified
CEPA (2015a) and CEPA (2015b)	Australian only sample, 2006-2013, adjusted opex data	pooled OLS ⁴²⁸ / random-effects GLS ⁴²⁹ Cobb-Douglas / Translog function	DV ⁴³⁰ : real opex Output: circuit length, customer density (length or km ²) OEF: selective variables from: undergrounding, RAB additions, 132kV share of circuit, share of SWER Other: Year	1 Use of Australian only data 2 Use of 132 kV variable 5 inadequate input/output specification Inappropriate

⁴²⁶ Economic Insights 2015, p. 45–46 (section 3.9).

⁴²⁷ Economic Insights, 2015, p. 53.

⁴²⁸ Ordinary least squares.

⁴²⁹ Generalised least squares.

⁴³⁰ Denotes dependent variable, this aligns with the input specification that we discuss above.

Consultancy report reviewed	Data	Benchmarking method	Model specification	Main issues identified
				adjustments to opex ⁴³¹
CEPA (2015a)	Full sample (Australia, NZ, Ontario) or jurisdiction-specific sample, 2006-2013	SFA Cobb-Douglas function	DV: real opex Output: customer number, circuit length, RMDemand OEF: undergrounding Other: Year	1 Use of Australian only data
FE (2015a)	Full sample, 2006-2013	True RE and True FE models ⁴³² Cobb-Douglas function	DV: real opex Output: customer number, circuit length, RMDemand OEF: undergrounding Other: Year	3 Use of latent heterogeneity model
FE (2015a)	Full sample or jurisdiction-specific sample, 2006-2013	SFA Cobb-Douglas function	DV: real opex Output: customer number, circuit length, RMDemand OEF: undergrounding Other Year	1 Use of Australian only data
FE (2015a)	Australian only sample, 2013 only	DEA CRS and VRS ⁴³³	Input: real opex Output: Energy delivered, RMDemand, customer number, before adding circuit length;	4 finding distributors efficient by default
FE (2015b)	Full sample, 2006-2013	SFA Cobb-Douglas	DV: real opex Output: customer number, circuit length, RMDemand OEF: undergrounding, squared term for customer density, share of circuit above 66kV, country dummies Other: Year	2 Use of 132 kV variable 5 inadequate input/output specification
FE (2015b)	Australian only sample used for second stage regression, average of the period data	Second-stage OLS analysis	DV: raw efficiency scores from EI model and FE's modified model respectively OEF: selected variables, including share of circuit above 66kV, customer density (linear vs spatial), weather variables (for example,	2 Use of 132 kV variable Single stage SFA is preferred, where appropriate. ⁴³⁴

⁴³¹ Economic Insights, 2015, p. 52.

⁴³² True random effects and true fixed effects.

⁴³³ Constant returns to scale and variable returns to scale.

⁴³⁴ Economic Insights, 2015, p. 37.

Consultancy report reviewed	Data	Benchmarking method	Model specification	Main issues identified
			wind gust speed, rainfall, temperature, humidity)	
Huegin (2015a)	Full sample, 2006-2013	SFA Cobb-Douglas function	DV: real opex Output: customer number, circuit length, RMDemand Undergrounding or Year variable is modelled for explaining the efficiency term	5 inadequate input/output specification
Huegin (2015a)	Australian only sample, 2006-2013	Opex PFP	Seven alternative model specification previously considered by EI and AER	5 inadequate input/output specification
Huegin (2015b)	Full sample	latent class modelling	DV: real opex Output: customer number, circuit length OEF: undergrounding	3 Use of latent heterogeneity model
Huegin (2015b)	Australian only sample	K-means clustering	18 variables on four dimensions are used to group the 13 Australian distributors	3 Use of latent heterogeneity model
Huegin (2015c)	Full sample vs. Australian only sample vs. Large rural only sample	SFA	DV: opex Output: customer number, circuit length, RMDemand OEF: undergrounding	1 Use of Australian only data
McKell (2014)	Australian only sample	OLS	DV: Upkeep cost per customer IV: line length	1 Use of Australian only data 5 inadequate input/output specification
PEGR (2014)	Australian sample (2006-2013) vs. Australian and US sample (unbalanced, with an addition of 170 observations for 15 US utilities 1995 to 2013)	FGLS ⁴³⁵	DV: real opex Output: customer number, distribution substation capacity, distribution structure kilometres – Translog function OEF: overhead line percentage, 132kv or above network (kilometre), average rainfall, Victoria Bushfire Risk dummy, US firm dummy (relevant only to transnational data) Other: Year	2 Use of 132 kV variable 6 unduly limited specification due to data availability Stata coding error identified ⁴³⁶

⁴³⁵ Feasible generalised least squares.

⁴³⁶ Economic Insights, 2015, p. 52.

Consultancy report reviewed	Data	Benchmarking method	Model specification	Main issues identified
Synergies (2015b)	Australian and NZ sample	DEA	Output: customer number, peak demand, circuit length Input: operating costs, MVA of transformer capacity, user cost of capital associated with distribution lines	4 finding distributors efficient by default 5 inadequate input/output specification
Synergies (2015b)	Full sample or data from each jurisdiction, 2006–2013	SFA and LSE Cobb–Douglas function	DV: real opex Output: customer numbers, circuit length, RMDemand OEF: undergrounding Other: Year	1 Use of Australian only data

Source: CEPA (2015a), Benchmarking and Setting Efficiency Targets for the Australian DNSPs: An Expert Report for ActewAGL Distribution, 19 January.
 CEPA (2015b), Ausgrid – Attachment 1.07 – David Newbery Expert Report, January.
 Frontier Economics (2015a), Review of the AER's Econometric Benchmarking Models and Their Application in the Draft Determinations for Networks NSW: A Report prepared for Networks NSW, January.
 Frontier Economics (2015b), Taking Account of Heterogeneity Between Networks When Conducting Economic Benchmarking Analysis: A Report prepared for Ergon Energy, February.
 Huegin (2015a), Huegin's Response to Draft Determination on behalf of NNSW and ActewAGL, Technical Response to the Application of Benchmarking by the AER, 16 January.
 Huegin (2015b), Heterogeneity in Electricity Distribution Networks: Testing for the Presence of Latent Classes, 12 February.
 Huegin (2015c), Benchmarking Ergon Energy's Operating Expenditure: A Study of the Relevance of the NSW Draft Decision Outcome on Ergon Energy's Benchmarking Results, 10 February.
 McKell Institute (2014), Nothing to Gain, Plenty to Lose: Why the Government, Households and Businesses Could End Up Paying A High Price for Electricity Privatisation, December.
 Pacific Economics Group Research (2014), Database for Distribution Network Services in the US and Australia, Final Report, 21 August.
 Synergies Economic Consulting (2015), Concerns over the AER's Use of Benchmarking as It Might Apply in Its Forthcoming Draft Decision on Ergon, January.

Partial performance indicators

In this sub-section we reiterate why PPIs are an appropriate means of testing the benchmarking results. In doing so we respond to ActewAGL's submissions.

Our view in the draft decision was, and it remains our view in this final decision, that the PPI results complement the economic benchmarking results.⁴³⁷

⁴³⁷ While an observation of high costs on a single PPI does not necessarily indicate inefficiency, similar results across a number of PPIs can be more reliable. In this respect, it is useful to compare PPI results with the economic benchmarking results.

In the draft decision, we compared the average performance of ActewAGL to its peers (and quantified the gap between Powercor—one of the economic benchmarking frontier performers) on two measures.⁴³⁸

- average annual user cost per customer for 2009–13 (Figure A.7)
- opex per customer for 2009–13 (Figure A.8).

These PPIs produced consistent results to the economic benchmarking, indicating that ActewAGL had higher costs than many of its peers (including Powercor).

In its revised proposal, ActewAGL acknowledge that PPIs may assist in identifying areas that warrant further investigation, but considered that using them to cross check the economic benchmarking findings is an error due to their inherent limitations.⁴³⁹

ActewAGL refers to the joint ACCC/AER joint working paper on economic benchmarking techniques, referring to the statement that PPIs "... should not be viewed in isolation as a definitive assessment on the efficiency of an energy network business."⁴⁴⁰

ActewAGL considers we have not acknowledged the three broad limitations of PPIs mentioned in the working paper:⁴⁴¹

- data quality
- their one-dimensional nature
- the assumed linear relationship between inputs and outputs.

We agree that PPIs do have their limitations and are not appropriate for definitively assessing relative efficiency. However, we consider the limitations of PPIs do not preclude us from using them to cross-check our economic benchmarking results.

Data quality

ActewAGL consider the economic benchmarking data (the data from which we derived the PPIs) has not been collected on a consistent basis, meaning comparisons made using PPIs are flawed.⁴⁴² As we explain above in relation to economic benchmarking, we undertook a rigorous data testing and validation process to ensure the consistency and comparability of the economic benchmarking data. In particular, the data comes from the distributors' own systems (from which they prepare their regulatory proposals) and has been subject to independent audit and CEO declaration. This provides us comfort that the data is robust and suitable for benchmarking purposes.

⁴³⁸ AER, Draft Decision, Attachment 7, pp. 7-64 to 7-68.

⁴³⁹ ActewAGL, revised proposal, p. 182.

⁴⁴⁰ ACCC/AER, Benchmarking opex and capex in energy networks working paper no. 6, May 2012, p. 35.

⁴⁴¹ ActewAGL revised proposal, pp. 182–183.

⁴⁴² ActewAGL. Revised proposal, p. 183.

One-dimensionality

ActewAGL submits (citing the ACCC/AER joint working paper⁴⁴³) that because PPIs consider only one aspect of a business at a time and do not account for differences in the operating environment they can be misleading.⁴⁴⁴

ActewAGL also considers it is not surprising that out our PPIs and economic benchmarking models provide similar results, because both are derived from the same cost data and the same cost driver (customer numbers).⁴⁴⁵ In support of an alternative cost driver, ActewAGL references a number of reports that state that both customer numbers and energy density are the two main operating factors, which it considers stand in contrast to approach to the use of PPIs.⁴⁴⁶

Limitations due to one-dimensionality

Regarding ActewAGL's first comment, we recognised in our draft decision that there are limitations in using PPIs. We explicated that we must interpret the results of PPIs with these limitations in mind:⁴⁴⁷

Powercor's customer density makes it a better point of comparison to ActewAGL than CitiPower (the other top performer) because CitiPower is significantly denser than all other service providers. Powercor, on the other hand, has a lower customer density than ActewAGL. This means, in theory that Powercor should be at a cost disadvantage relative to ActewAGL (due to its higher customer density).

Importantly, this is a limitation of PPIs only; it does not apply to our economic benchmarking techniques because they explicitly take customer density into account.

...

PPIs do not explicitly account for operating environment factors, so we must bear this in mind when interpreting the results. However, we have taken measures to minimise the effects of operating environment factors on PPIs. To account for scale, we normalised our PPIs by customer numbers. Customer numbers is an easily understandable output measure that reflects the relative scale of service providers. Economic benchmarking also suggests customer numbers is the most significant driver of costs.

⁴⁴³ ACCC/AER, Benchmarking opex and capex in energy networks working paper no. 6, May 2012, pp. 17–18.

⁴⁴⁴ ActewAGL, revised proposal, pp. 183–184.

⁴⁴⁵ ActewAGL, revised proposal, p. 185.

⁴⁴⁶ ActewAGL, revised proposal, p. 185; AEMC, Review into the use of Total Factor Productivity for the determination of prices and revenues, Framework and Issues Paper, December 2008, p. 14; ACCC/AER, Benchmarking opex and capex in energy networks working paper no. 6, May 2012, p. 59; Advisian, Opex cost drivers ActewAGL Distribution Electricity (ACT), January 2015, pp. 36–44. ActewAGL also reference reports by Economic Insights in respect of gas distribution businesses. Economic Insights, Econometric Estimate of the Victorian Gas Distribution Businesses' Efficiency and Future Productivity Growth, March 2012, p. 11; Economic Insights, The Total Factor Productivity Performance of Victoria's Gas Distribution Industry, March 2012, p. 14; Economic Insights, Assessment of Data Currently Available to Support TFP-based Network Regulation, June 2009, p. 14; Economic Insights, Regulation of Suppliers of Gas Pipeline Services – Gas Sector Productivity, February 2011, p.33.

⁴⁴⁷ AER, Draft Decision, Attachment 7, pp. 7-61 to 7-64.

We never suggested that PPIs are useful for determining relative efficiency. We agree with the ACCC/AER working paper that PPIs are useful for cross checking more sophisticated techniques rather than for determining efficiency in isolation. Other consultants seem to agree with this view.⁴⁴⁸

Further, the inability of PPIs to explicitly account for operating environment factors does not preclude us from comparing the results to our economic benchmarking results. This is because we explicitly consider uncontrollable differences between service providers in our assessment of operating environment factors. We consider these qualitative findings prior to determining the quantum of any adjustment we might make to base opex.

Data and cost drivers used for PPIs and economic benchmarking

The PPIs use the same database as the economic benchmarking models. However, it does not follow that the cost drivers are the same, or that results between the two techniques will be similar.

The economic benchmarking models use several cost drivers. While customer numbers (also used in PPIs) is one of those cost drivers, the economic benchmarking models also use circuit line length, ratcheted maximum demand and energy delivered. In addition, the MTFP and opex MPFP models include reliability as an output. The economic benchmarking models also explicitly account for operating environment differences, which PPIs do not.

As a result, the PPIs are completely different to the economic benchmarking models. Accordingly, we consider they are useful as a cross check and, in performing this role, they corroborate the economic benchmarking results.

The assumed linear relationship between inputs and outputs

ActewAGL submits that PPIs are limited because they assume a linear relationship between inputs and outputs. ActewAGL considers this means the PPIs do not contemplate smaller firms having higher per customer costs.⁴⁴⁹ Again, ActewAGL refers to the ACCC/AER joint working paper.⁴⁵⁰

We do not dispute that PPIs are limited by the assumption of a linear relationship between inputs and outputs. However we again note that ActewAGL has taken our commentary of PPIs out of context. We recognise the limitations of PPIs preclude us from making a definitive assessment but not from using them as a means of comparison or for cross checking economic benchmarking techniques, which explicitly account for ActewAGL's small size.

⁴⁴⁸ For example, Cambridge Economic Policy Associates, Background to Work on Assessing Efficiency for the 2005 Distribution Price Control Review – Scoping Study: Final Report, September 2003, pp. 25–26.

⁴⁴⁹ ActewAGL, revised proposal, pp. 186–187.

⁴⁵⁰ ACCC/AER, Benchmarking opex and capex in energy networks working paper no. 6, May 2012, pp. 17, 32.

A.5 Category analysis and qualitative review

The aim of this section is to investigate the gap in performance that we identified in our economic benchmarking analysis between ActewAGL and the frontier service providers. This is a two stage process where we first examine ActewAGL's proposals and use category analysis to identify potential drivers of the gap in performance, and then conduct targeted detailed reviews based on our first stage findings.

We have:

- examined ActewAGL's explanations of opex drivers in its regulatory proposal and supporting material (stage 1)
- conducted category analysis benchmarking for major categories of opex (stage 1)
- engaged Energy Market Consulting Associates (EMCa) to undertake independent detailed reviews of two key expenditure categories (stage 2):
 - labour costs
 - vegetation management.

This analysis can corroborate our economic benchmarking analysis, which looks at the efficiency of opex overall. It can do so by identifying factors that are contributing to ActewAGL's overall efficiency performance.

Importantly, the NER require us to form a view on total forecast opex.⁴⁵¹ In doing so, we are not required to assess individual projects or components of a forecast. It is, therefore, appropriate for us to rely on top down techniques such as economic benchmarking to assess whether a service provider's opex proposal reasonably reflects the opex criteria. However, while we could have relied solely on our economic benchmarking techniques to form a view about the efficiency of opex, we have supplemented that analysis with category analysis and detailed review. This is consistent with the Guideline, which explains that we will apply a number of different techniques to form a view about the efficiency of base opex.⁴⁵²

Category analysis and detailed review can assist in identifying whether base opex contains inefficiencies when they examine large portions of opex.

Therefore, we have used category analysis metrics to identify significant categories of expenditure that are high relative to other service providers. We have then investigated some of those categories of expenditure further with the aid of experts to form a view about whether those categories could be contributing to overall inefficiency. While we have not reviewed every category of expenditure, by reviewing labour costs (which

⁴⁵¹ NER, cl. 6.5.6(c).

⁴⁵² AER, *Better regulation: Expenditure forecast assessment guideline for electricity distribution*, November 2013, pp. 17–21.

comprise approximately 80 per cent of ActewAGL's base year opex⁴⁵³) we are examining a significant proportion of opex.

We are not using category analysis and detailed review to either examine all of opex or produce highly disaggregated findings. The NER do not require us to conduct and, indeed, the regulatory regime discourages us from conducting, a complete 'line by line' bottom up review of a service provider's operations. To this end, submissions that contend our category analysis metrics are flawed because they do not reconcile with the economic benchmark results misunderstand these techniques.⁴⁵⁴ Category analysis and detailed review are not designed to reconcile with our overall benchmarks, they are designed to identify and explain the drivers of efficiency performance.

As set out in section A.2, in the context of information asymmetry between the regulator and the service provider, it is neither feasible nor desirable for the regulator to make findings at a granular level about the manner in which a service provider should operate. It is for the service provider's management to decide how best to operate its network with the opex that we determine reasonably reflects the opex criteria. We have primarily formed a view about efficiency drawing on the results of overall outcomes (economic benchmarking), which is corroborated by the detailed review.

A.5.1 Position

As part of our draft decision review of ActewAGL's regulatory proposal, we found that one of the reasons ActewAGL overspent the opex forecast for the 2009–14 period was due to high labour expenditure. ActewAGL's regulatory proposal also suggested its revealed expenditure may contain some inefficiencies. For example, it contained information about a restructure following a 'major' organisational review conducted by Marchmont Hill Consulting (MHC). This review found some significant cultural and performance problems within ActewAGL's operations.⁴⁵⁵

ActewAGL's regulatory proposal attributed increased vegetation management, following higher than average rainfall in prior years, as another reason ActewAGL overspent against its opex forecast in 2012–13.⁴⁵⁶

Further, when we compared components of ActewAGL's opex to its peers using category analysis we found that ActewAGL had 'very high' costs on labour and vegetation management metrics compared to most of its peers.

Accordingly, (and because these categories account for a significant proportion of ActewAGL's opex) we conducted detailed reviews of labour and vegetation

⁴⁵³ ActewAGL Annual Reporting RIN 2012-13, tab 12 'Cost Categories.' Note that 'Other' expenditure category consists mainly of corporate management overheads per email received on 13 October 2014.

⁴⁵⁴ ActewAGL, Revised regulatory proposal: 2015–19 regulatory control period, January 2015, pp. 189.

⁴⁵⁵ ActewAGL, Regulatory Proposal, pp. 216–217.

⁴⁵⁶ ActewAGL, Regulatory Proposal, p. 218.

management opex. Through our detailed review, we found significant issues in these categories of ActewAGL's opex, which we considered was evidence of base year inefficiency, supporting our benchmarking results.

In its revised proposal, ActewAGL disagreed with our draft decision findings, particularly those arising from detailed review.⁴⁵⁷ While we have carefully considered ActewAGL's submissions, our final decision is:

- category analysis is an appropriate technique for diagnosing areas for further qualitative review; and
- our further qualitative reviews demonstrate that ActewAGL's labour and workforce practices and vegetation management are likely key drivers of ActewAGL's benchmarking performance relative to its peers.

Category analysis

Our category analysis techniques indicate that ActewAGL may be comparable to some of its peers for certain categories of opex but appear to have high or very high expenditure for significant categories of expenditure. These include labour, overheads and vegetation management. Reviewing some of these key categories of expenditure in further detail could explain some of the drivers of the economic benchmarking results. Table A.5 shows the summary of the category analysis results.

Table A.5 Summary of category analysis metrics: ActewAGL's relative costs (average over 2008–09 to 2012–13)

	ActewAGL
Labour	Very High
Total overheads	High
Total corporate overheads	Comparable
Total network overheads	High
Maintenance	Very High
Emergency response	Comparable
Vegetation management	Very High

Source: AER analysis.

Note: (1) ActewAGL is marked as 'high' when it appears above most of its peers and 'comparable' where the gap is less distinct. 'Very high' indicates a substantial gap between most service providers.

(2) In this final decision, we re-examined our summary of the category analysis metrics and concluded that ActewAGL's network overhead performance should be interpreted as 'high,' rather than 'comparable'.

⁴⁵⁷ ActewAGL, *Revised regulatory proposal: 2015–19 regulatory control period*, January 2015, pp. 188–204.

We discuss category analysis in more detail in section A.5.3.

Detailed review of labour and workforce practices

The category analysis results and our findings from reviewing ActewAGL's regulatory proposals suggest ActewAGL has high labour costs. Our view is that ActewAGL's labour costs are driven more by having too many employees rather than by cost per employee. This is because ActewAGL has expanded its permanent workforce significantly since 2005–06⁴⁵⁸ and has more ASLs⁴⁵⁹ per customer than many of its peers.

We engaged EMCa to conduct an independent detailed review into ActewAGL's labour costs (including work practices, processes and systems). EMCa examined all material provided by ActewAGL and reached conclusions that are consistent with our draft decision findings that ActewAGL's labour and workforce practices are likely to be a cause of high expenditure in the base year.⁴⁶⁰ Therefore, we consider EMCa's findings support the benchmarking results. EMCa's assessment supports the systemic issues we identified in our draft decision, as follows:⁴⁶¹

- EMCa considered that based on its review of ActewAGL's own information (including two reports by its own consultants), there is evidence that ActewAGL's work practices, processes and systems in 2012–13 were ineffective. EMCa considered that these ineffective work practices, processes and systems lead to inefficient use of labour in the office and field. This inefficiency is characterised by duplication of effort in work planning and scheduling, loss of field productivity through ineffective works management and through ineffective data and information management;
- EMCa considered that ActewAGL's labour levels were not reasonably efficient in 2012–13, noting that ActewAGL has steadily increased its ASL based on assumed future growth scenarios and adopting an internal resourcing strategy. EMCa considered that if ActewAGL had outsourced more of its work, it would likely have benefited from increased labour flexibility and reduced operating costs. EMCa did not agree with ActewAGL's claim that its labour contract and the local labour market precluded an outsourcing strategy. EMCa considered that ActewAGL's strategy is likely to have resulted in a higher level of expenditure than that which would be required by a service provider acting to prudently and efficiently minimise its costs; and

⁴⁵⁸ ActewAGL's total permanent ongoing employees increased by 20 per cent over the 2009–14 regulatory control period. Just prior to the 2009–14 regulatory control period, ActewAGL expanded its permanent employees by 27 per cent over 2005–06 to 2008–09. ActewAGL, Response to AER Questions 19 September, q1.

⁴⁵⁹ Average staffing level. One ASL is equivalent to one FTE undertaking standard control services work, receiving salary or wages over an entire year.

⁴⁶⁰ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, pp. ii–iii.

⁴⁶¹ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. ii.

- EMCa found a lack of compelling evidence to demonstrate that ActewAGL's labour costs in 2012–13 were reflective of an efficient service provider. EMCa considered this was evident by the relatively high level of internal resources used and the extent to which work was outsourced on an hourly rate bases for the urgent clearance of vegetation.

We discuss EMCa's findings in more detail in section A.5.3.

Detailed review of vegetation management

EMCa also reviewed ActewAGL's vegetation management practices and reached conclusions that are consistent with our draft decision that vegetation management practices are likely to be a cause of high expenditure in the base year. In particular, EMCa found:⁴⁶²

- ActewAGL did not act prudently and efficiently to manage costs associated with increased vegetation growth that occurred prior to 2012–13 because its vegetation management practices and its strategic and tactical responses were inadequate;
- evidence of inefficient vegetation management costs in 2012–13 due to the manual processes between the office and field and the extent of clearance work that was deemed to be urgent, and which was therefore undertaken with a resultant higher cost. It is EMCa's view that a service provider acting to efficiently minimise costs would have incurred a lower level of urgent clearance work.

We discuss EMCa's findings in more detail in section A.5.3.

A.5.2 Draft position

In our draft decision, we considered information in ActewAGL's regulatory proposal and findings from category analysis metrics supported an examination of labour and vegetation management opex in further detail. Through our detailed review, we found significant issues in these categories of ActewAGL's opex, which we considered was evidence of base year inefficiency, supporting our benchmarking results.

From our review of ActewAGL's labour and workforce management practices, we uncovered inefficiencies arising from:⁴⁶³

- significantly lower proportions of outsourcing than more efficient peers
- workplace structure, culture and performance issues that have been identified by its own consultant
- large increases in the number and cost of permanent employees leading up to and during the 2009–14 period

⁴⁶² EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, pp. ii–iii.

⁴⁶³ AER, *ActewAGL draft decision Attachment 7: Operating expenditure*, November 2014, pp. 7-46–47.

- restructuring that has led to an outlay of costs but little evidence of corresponding quantifiable benefit
- an enterprise agreement that contained, in some instances, more restrictive provisions on labour engagement and management than the enterprise agreements of ActewAGL's peers.

Our review of ActewAGL's vegetation management practices indicated two primary reasons inefficiency may exist in the base year:⁴⁶⁴

- primarily engaging contractors on an hourly rate basis rather than a work volume basis
- a lack of prudent operational risk management, resulting in a largely reactive approach to maintaining vegetation.

A.5.3 Revised proposals and submissions

In this section we summarise and respond to the issues ActewAGL raised in its revised regulatory proposal. For the reasons that follow, we remain of the view that labour is a driver of ActewAGL's benchmarking performance. We also remain of the view that ActewAGL's vegetation management practices are another driver of its benchmarking performance.

ActewAGL's revised proposal focussed more on our detailed reviews of labour and vegetation management than on category analysis. Given this, we engaged EMCa for the final decision to independently review labour and vegetation management having regard to ActewAGL's revised proposal. We first present EMCa's analysis given the significance of the detailed review to our overall findings. We present our category analysis findings second as ActewAGL's submissions on category analysis do not change the reliance we place on category analysis in our assessment approach.

Detailed reviews

For the final decision, we considered it appropriate to engage EMCa to independently form a view on whether ActewAGL's labour and workforce practices and vegetation management practices could be contributing to the performance gap identified by our benchmarking. EMCa considered ActewAGL's submissions and presented new evidence to support our assessment in the draft decision that there are systemic issues in ActewAGL's practices.⁴⁶⁵

⁴⁶⁴ AER, *ActewAGL draft decision Attachment 7: Operating expenditure*, November 2014, p. 7-47.

⁴⁶⁵ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, pp. i-iii.

For procedural fairness, we gave ActewAGL an opportunity to comment on EMCa's draft report. ActewAGL's response raised several issues with EMCa's draft report. ActewAGL:⁴⁶⁶

- suggested EMCa's conclusions were unsubstantiated by evidence, reasoning or analysis
- questioned EMCa's expertise on forming a view on the efficiency and prudence of ActewAGL's labour and vegetation management practices in 2012–13
- questioned EMCa's independence
- considered EMCa had not adequately had regard to its revised regulatory proposal and the evidentiary material adduced in support of that proposal
- considered EMCa had not followed the scope of work provided by the AER or disclosed all of the materials it was instructed to consider.

In finalising its report, EMCa has considered all of ActewAGL's comments. EMCa's conclusions, however, remain the same as those from its draft report.⁴⁶⁷

We are satisfied that EMCa's qualifications and experience are appropriate and, therefore, EMCa's report has probative value in identifying factors behind ActewAGL's performance on our economic benchmarking techniques. We have placed weight on EMCa's findings for our final decision. We are also satisfied that EMCa has appropriately responded to the concerns raised by ActewAGL, both in its revised proposal and in response to EMCa's draft report.

EMCa's overall findings are that there is supporting qualitative evidence for our key findings (in the draft decision) in relation to the lack of prudence and efficiency in ActewAGL's 2012–13 labour and vegetation management expenditure.⁴⁶⁸

On this basis, EMCa considers that it is likely that ActewAGL's overall level of opex in 2012–13 was not prudent and efficient. We are satisfied that EMCa's findings support the benchmarking results.

Detailed review of labour and workforce practices

In response to our draft decision, ActewAGL considered that our detailed review of its labour costs did not substantiate our benchmarking analysis because, in ActewAGL's view:⁴⁶⁹

⁴⁶⁶ ActewAGL, *ActewAGL distribution's response to EMCa's draft report for the review of ActewAGL distribution's labour resourcing and vegetation management practices*, March 2015, p. 2.

⁴⁶⁷ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, Addendum.

⁴⁶⁸ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, pp. i-iii. EMCa notes that one of our draft decision findings should be set aside, which was our observation that the increasing number of vegetation-related supply interruptions may be contributing to inefficiency.

- ActewAGL is comparable to its peers on a cost per (Average Staffing Level) ASL basis, and on an ASL per customer basis
- ActewAGL's consultant, ABLA, considered that ActewAGL's Enterprise Bargaining Agreement (EBA) is not any more restrictive or any more generous compared to ActewAGL's peers
- we have not demonstrated that higher levels of outsourcing will deliver more efficient expenditure and
- our findings on the impact on opex of restructuring, cultural issues and redundancy costs did not recognise that its opex forecast contains implicit productivity growth.

Average staffing levels

In its revised proposal, ActewAGL raised concerns with our approach to comparing cost per ASL across service providers, it considered:⁴⁷⁰

- we did not fully account for differences in outsourcing practices
- it is the characteristics of the network that drive costs rather than customer numbers
- the analysis does not account for economies of scale. ActewAGL considers that larger networks are more likely to access economies of scale and hence appear more efficient.

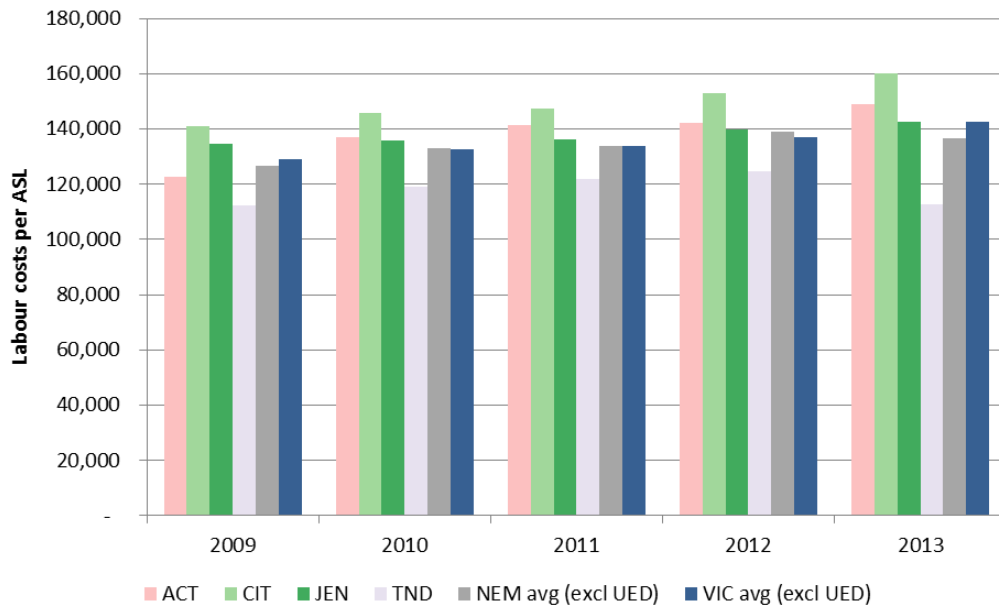
We have reconsidered costs per ASL and, while ActewAGL's cost per ASL has increased over the 2009–14 period, we agree it is unlikely to be the main driver of the difference in labour costs, which Figure A.7 demonstrates. Figure A.7 compares ActewAGL's labour costs per ASL to other small NEM service providers and the averages of the Victorian and NEM service providers.⁴⁷¹

⁴⁶⁹ ActewAGL *Revised regulatory proposal: 2015–19 regulatory control period*, January 2015, p. 200–202; Advisian, *Opex cost drivers: ActewAGL distribution electricity (ACT)*, January 2015, p. 96; ABLA, *Review and comparison of ActewAGL's enterprise agreement provisions against other electricity network service providers*, January 2015, pp. 4–5; ActewAGL, *Revised Regulatory Proposal*, Attachment C11, 2–23.

⁴⁷⁰ ActewAGL, *Revised regulatory proposal: 2015–19 regulatory control period*, January 2015, pp. 200–201

⁴⁷¹ The Victorian and NEM figures exclude United Energy because it is an outlier due to its very low ASLs over the period. We presented the Victorian and NEM figures in the draft decision; AER, *ActewAGL draft decision Confidential appendix: Attachment 7: opex*, p. 13.

Figure A.7 Labour costs per ASL, 2009–2013 (\$2013-14)

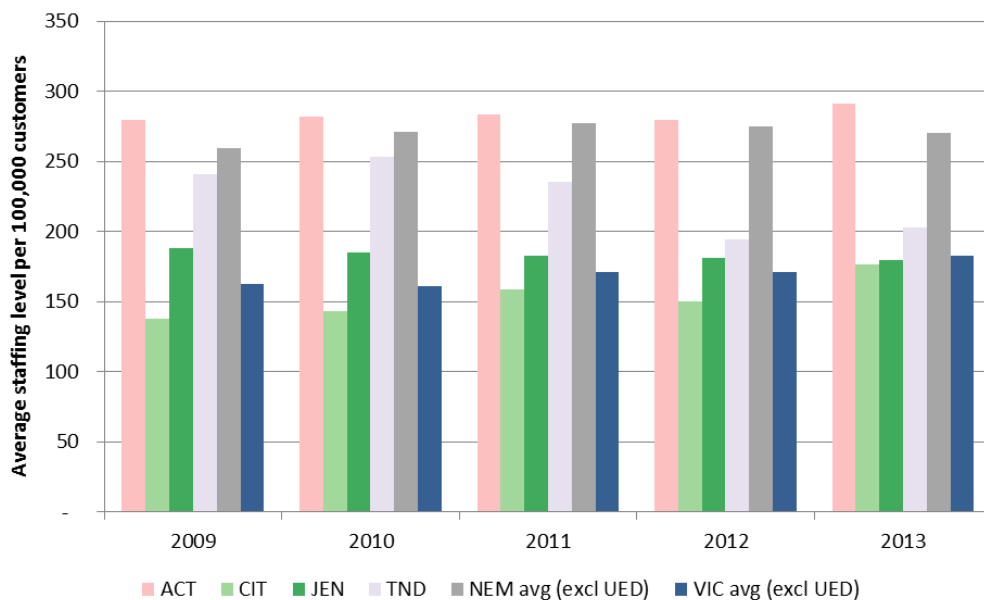


Source: Category analysis RIN responses.

Note: The Victorian and NEM figures exclude United Energy because it outsourced the vast majority of all operational work over the period.

However, because ActewAGL has more ASLs per customer than many of its peers, permanent staff levels are likely driving high labour costs, per Figure A.8.

Figure A.8 Average staffing levels per 100,000 customers, 2009–2013



Source: Category analysis RIN responses.

Note: The Victorian and NEM figures exclude United Energy because it outsourced the vast majority of all operational work over the period.

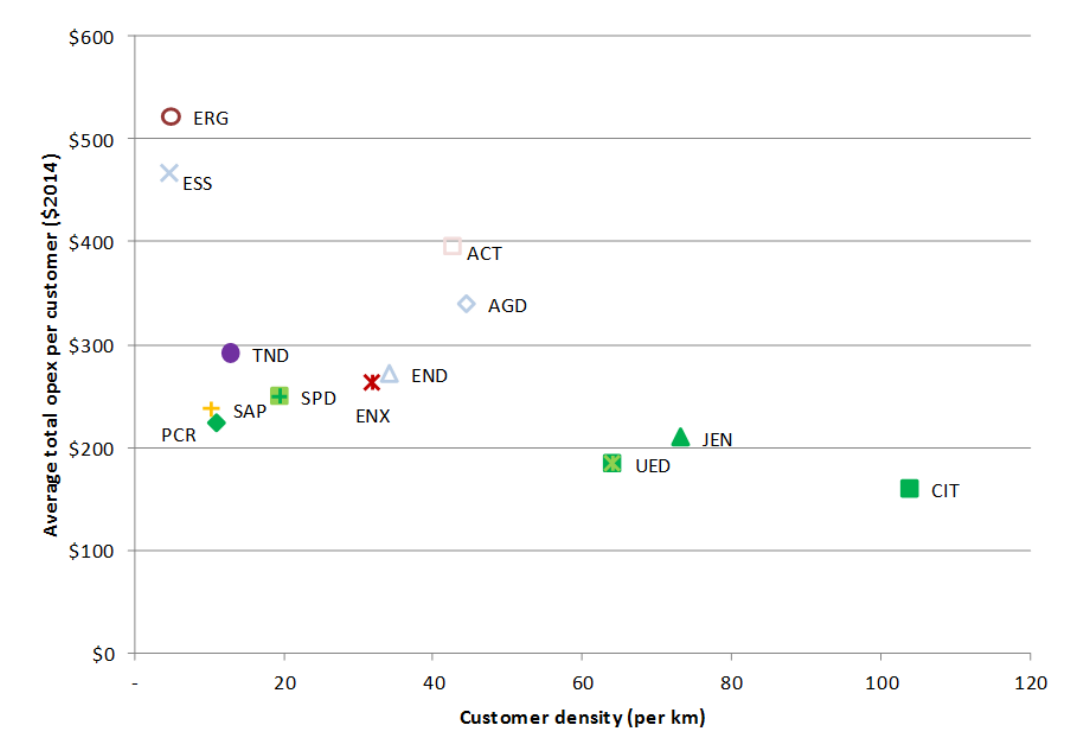
Figure A.8 compares ActewAGL's ASLs per 100,000 customers to other small NEM service providers and the averages of the Victorian and NEM service providers. It shows that ActewAGL's ASLs per customer is well above both CitiPower and Jemena, which are also small service providers. ActewAGL is also above TasNetworks, which is small and geographically isolated, yet exhibits improved performance on this metric over the 2009–13 period.

For these metrics, we consider that customer numbers (rather than network characteristics, as ActewAGL submits) is the most appropriate output measure. This is because customer numbers captures a fixed component of distribution output that service providers cannot control. We have considered other network characteristics in our economic benchmarking analysis (see section A.4).

While we acknowledge ActewAGL's comment on outsourcing, we do not consider that accounting for all differences in outsourcing practices is required when comparing ASLs per customer. Lower ASLs per customer may indicate a greater degree of outsourcing, and vice versa. However, it is not possible to fully control for outsourcing given that service providers do not tend to contract for inputs (staff). Rather, they contract to deliver a certain output.

Since labour forms a large proportion of opex (approximately 80 per cent, in ActewAGL's case) opex per customer is indicative of labour costs per customer. Figure A.9 shows ActewAGL has higher opex per customer than most of its peers.

Figure A.9 Average annual opex per customer for 2009–2013 against customer density (\$2013-14)



Source: Economic benchmarking RIN responses.

Figure A.9 compares service providers with varying mixes of internal staff and outsourcing. It is apparent that ActewAGL's high ASL is a driver of high opex and, therefore, high labour costs.

To this end, service providers who outsource will likely have done so because they expect to realise efficiencies. Indeed, as we discuss below, the service providers who have lower labour cost per customer, ASL per customer and opex per customer have realised efficiency gains due to outsourcing. ActewAGL, on the other hand, has not explored all opportunities to outsource.

If we compare ActewAGL to CitiPower, for example it is evident that ActewAGL is employing higher proportions of internal labour. CitiPower has higher labour costs per ASL but much lower ASLs per customer. This indicates that it is outsourcing low skilled work, but retaining high skilled workers in house. CitiPower's low opex per customer in Figure A.9.

On the other hand, ActewAGL has high labour costs per ASL and very high ASLs per customer. This indicates it is employing a large amount of internal staff at a high cost. ActewAGL's statements that it must pay its employees more due to difficulty attracting and retaining them is consistent with this finding. ActewAGL's approach may not necessarily be inefficient, but appears to be contributing to its very high opex per customer in Figure A.9 (and our economic benchmarking).⁴⁷² As a result, ActewAGL could potentially achieve efficiencies by outsourcing more.

Outsourcing will not necessarily be the lowest cost option in every circumstance. However, as we discuss below, EMCa considers that ActewAGL, due to restrictions on outsourcing in its EBA, faces limitations on resourcing flexibility and cost. This means that ActewAGL does not appear to be adopting (or attempting to adopt) the lowest cost option.⁴⁷³

We do not consider that economies of scale explain ActewAGL's poor performance on ASLs per customer because other small service providers perform relatively well on this metric. For instance, ActewAGL appears to perform relatively less well on this metric to TasNetworks, which also operates a small and more dispersed network that is remote from the major metropolitan cities. EMCa also considers economies of scale as part of its analysis.

Efficiency of labour levels

In its revised proposal, ActewAGL considers its labour levels are efficient and that we did not provide evidence of inefficiency.⁴⁷⁴ EMCa disagrees with ActewAGL's view that its labour levels are efficient.

⁴⁷² ActewAGL, Revised Regulatory Proposal, Attachment C11, pp. 11-13.

⁴⁷³ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, section 3.4.3.

⁴⁷⁴ ActewAGL, *Revised regulatory proposal: 2015–19 regulatory control period*, January 2015, pp. 200–202.

EMCa examined ActewAGL's workforce planning by assessing the information provided by ActewAGL. EMCa considers that a number of issues taken together indicate systemic issues that mean ActewAGL's ASL is not optimal.⁴⁷⁵ These workforce planning issues include:⁴⁷⁶

- a failure to retest the assumption in its 2010 workforce plan, of a forecast increase in workforce demand. EMCa consider ActewAGL should have refreshed its workforce plan, recognising growing industry concerns over increasing electricity network costs, and that other utilities were embarking on opex reduction programs
- forecasting demand based on an underlying assumption (without justification or reference to where the assumption is supported by analysis) that work will increase inexorably. EMCa consider this is indicative of a bias to increase the ASL
- a supply strategy that is narrow in that it appears to be based solely on an internal growth strategy without any reference to increasing external supply. There is no evidence that ActewAGL gave any consideration to a complementary delivery strategy in formulating its workforce plan
- there is no indication that ActewAGL has considered the affordability of its proposed strategy.
- Further, EMCa consider that ActewAGL's redundancy terms in its EBA have led to high payments. However, it does not appear that the redundancies were offset over the ensuing years by savings. This has contributed to its labour costs in 2012–13.⁴⁷⁷ EMCa note that the basis for ActewAGL incurring redundancy payments is not clear, on observation of the ensuing steady increase in its ASL, and no evidence of a business case to support the payments.⁴⁷⁸

Inability to outsource key work

In stating its labour costs and workforce practices are efficient, ActewAGL considered that we had not demonstrated that higher levels of outsourcing will deliver more efficient expenditure.⁴⁷⁹ As we mention above, EMCa consider a resourcing strategy based on more outsourcing (rather than ASL growth) would have provided ActewAGL with more resource and cost flexibility, which is likely to lead to more efficient costs overall.⁴⁸⁰

⁴⁷⁵ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, section 3.3.3.

⁴⁷⁶ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, section 3.3.3.

⁴⁷⁷ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 18.

⁴⁷⁸ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 18–19.

⁴⁷⁹ ActewAGL, Revised regulatory proposal: 2015–19 regulatory control period, January 2015, p. 202.

⁴⁸⁰ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 19.

EMCa considers that the decision of various service providers to outsource a significant proportion of work has been supported by claims of significant operational efficiencies.⁴⁸¹ EMCa cite the following examples:

- Jemena: 17 per cent saving;

‘By 2010, JEN will have achieved operating efficiencies totalling \$54.4 million or 16.9 per cent of the ESC’s opex allowance’ and ‘The outsourced contracts provide JAM with the flexibility to increase and decrease its requirements based on its work program. They also provide JEN access to a larger and more flexible workforce than it could prudently maintain on a standalone basis.’⁴⁸²

- Powercor: 21 per cent saving;

KPMG found that, if Powercor Australia had delivered its nominated services for the year ended 31 December 2008 on a standalone basis, its efficient cost of service delivery would have been \$16.930 million (21 percent)(\$2008) more than the costs it actually incurred for these services (excluding related party margins).⁴⁸³

- CitiPower: 45 per cent saving;

KPMG found that if CitiPower had delivered its nominated services for the year ended 31 December 2008 on a standalone basis, its efficient cost of service delivery would have been \$19.049 million (45 per cent)(\$2008) more than the costs exclusive of margins it actually incurred for these services.⁴⁸⁴

While EMCa observes that EBA restrictions on outsourcing are not unique to ActewAGL, EMCa notes that other service providers have successfully pursued a strategy of outsourcing a greater portion of their work to achieve efficiencies. In EMCa’s view, it has not seen compelling evidence that ActewAGL explored all possible avenues to overcome EBA restrictions and vigorously pursue a similar outsourcing strategy.⁴⁸⁵

In moving toward a successful outsourcing arrangement, EMCa believe ActewAGL could have considered:⁴⁸⁶

- partnering with NSW service providers (particularly Essential Energy, due to its proximity) to explore strategic outsourcing arrangements (that is, to increase its

⁴⁸¹ EMCa, *Review of ActewAGL Distribution’s Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 21.

⁴⁸² Jemena, Regulatory Proposal, 2009, pp. 10, 121.

⁴⁸³ Powercor, Regulatory Proposal, 2009, p. 365.

⁴⁸⁴ CitiPower Regulatory Proposal, 2009, p. 76.

⁴⁸⁵ EMCa, *Review of ActewAGL Distribution’s Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 18.

⁴⁸⁶ EMCa, *Review of ActewAGL Distribution’s Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 22.

scale from the 'demand' side, which would mitigate perceived economies of scale concerns)

- exploring collaborative, performance based out-sourcing arrangements, with large suppliers, to draw on scale economies from the supply side
- exploring ways of overcoming perceived inefficiencies with using contract labour, including models that enable suppliers to more efficiently manage utilisation of their own resources.

EMCa considers ActewAGL's lack of outsourcing is a key reason why its labour costs in 2012–13 are not reflective of those of a prudent and efficient service provider.⁴⁸⁷

Work practices, processes and systems

EMCa's review included an examination of how ActewAGL runs its business. EMCa examined the MHC report, which ActewAGL commissioned in 2011. MHC found that problems exist in all areas of ActewAGL's operations, from the way ActewAGL plans its work, through to delivery, and how it monitors and controls its performance operationally and strategically.⁴⁸⁸ ActewAGL advised that it had 'rolled-out' the majority of its 34 initiatives in response to the 26 issues identified by MHC in 2011.⁴⁸⁹

EMCa disagrees with ActewAGL's view that it could have implemented the recommendations from the MHC report, which ActewAGL consider are implicit in its forecast productivity growth.⁴⁹⁰ In EMCa's opinion, a service provider would require 3 to 5 years to extract the full net benefits from the recommendations of the MHC report.⁴⁹¹ However, ActewAGL has indicated the time period to implement these recommendations was only 6-9 months.⁴⁹²

EMCa accept that some of the initiatives⁴⁹³ could be implemented in twelve months or less but the substantial net benefits are typically achieved over a longer time period, particularly given MHC observed that improvements were needed to all elements of ActewAGL's Operating Model—changing the organisational structure alone would not address all of the issues sustainably.⁴⁹⁴

⁴⁸⁷ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, pp. 20-22.

⁴⁸⁸ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, pp. 8–9.

⁴⁸⁹ ActewAGL, Revised Regulatory Proposal 2015-19, Attachment C11, table 1.1.

⁴⁹⁰ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 9.

⁴⁹¹ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 9.

⁴⁹² EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 9.

⁴⁹³ Organisational restructuring, performance management frameworks, and 'Winning Team Behaviours'.

⁴⁹⁴ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, pp. 8–9.

EMCa considers that in the absence of compelling evidence—ActewAGL has not provided evidence of quantified efficiency gains—ActewAGL has not made significant efficiency gains quickly enough to offset the implementation costs by 2012–13.

Additionally, EMCa found further evidence of systemic problems within ActewAGL's work practices, processes and systems. For example ActewAGL's 2014 Asset Management Strategy strongly suggests that the asset management capability, processes, systems, and practices in place in 2012–13 were sub-optimal. Several aspects of ActewAGL's Asset Management System are yet to be developed, for example.⁴⁹⁵

Further, ActewAGL does not have a consolidated works management system, which is likely to lead to:⁴⁹⁶

- Duplication of effort in 'head office' and in the field for work planning and scheduling;
- Loss of productivity in the field through sub-optimal field workforce planning; and
- Inefficient office-to-field and field-to-office information flows.

Given all of these issues, EMCa considers systemic issues in ActewAGL's work practices, process and systems existed in 2012–13, which translated into material opex inefficiency.⁴⁹⁷

Overall, EMCa considered there is evidence of systemic issues in ActewAGL's labour costs in 2012/13 and that those costs are not reflective of a prudent and efficient service provider.⁴⁹⁸

Detailed review of vegetation management

EMCa reviewed ActewAGL's revised proposal and presents evidence that is consistent with our assessment in the draft decision. That is, ActewAGL's vegetation management practices contain systemic issues that indicate sources of inefficiency.⁴⁹⁹

In its revised proposal, ActewAGL disagreed with our draft decision analysis of its vegetation management expenditure for the following reasons:⁵⁰⁰

⁴⁹⁵ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, pp. 10-11.

⁴⁹⁶ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 11.

⁴⁹⁷ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 11.

⁴⁹⁸ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 23.

⁴⁹⁹ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 36.

⁵⁰⁰ ActewAGL, Revised Regulatory Proposal, pp. 203–204, ActewAGL, Revised Regulatory Proposal 2015-19, Attachment C11.

- it does not corroborate the SFA results because we did not identify at least 40 per cent of ActewAGL's vegetation management expenditure as inefficient
- we did not provide evidence or analysis that contracting arrangements were a contributor to increased costs
- we did not have regard to evidence that ActewAGL's vegetation management program is proactive
- in concluding that vegetation management performance has deteriorated, we do not take into account the increase in vegetation growth over the period.

AER's assessment in the draft decision

Regarding ActewAGL's view that we have not identified 40 per cent inefficiency in its vegetation management opex, we are not applying the detailed review in the manner that ActewAGL suggests.

As we explain above, we use detailed review to identify some of the factors that are contributing to a service provider's overall efficiency performance and identifying drivers of inefficiencies. The evidence we present in the detailed review will not necessarily explain the entire performance gap quantified in the economic benchmarking because our intention is not to examine all of opex. Economic benchmarking techniques, on the other hand, do assess opex in totality. The detailed review helps us to identify if the benchmarking results are consistent with our more detailed examinations of ActewAGL's opex.

Contracting arrangements

EMCa did not agree with ActewAGL's submissions on our vegetation management findings.

In our draft decision, we considered that ActewAGL primarily used hourly rate contracting for vegetation management, which was likely leading to inefficiencies.

EMCa observes that ActewAGL was most likely applying the 'hybrid' approach (a mix of hourly rate, lump sum and/or annual budget-based contract types) during the period of high vegetation growth.⁵⁰¹ EMCa considers the hybrid approach, as deployed by ActewAGL, is appropriate to respond to foreseen levels of vegetation growth. Under such an approach, hourly rates are typically only used to respond to unforeseen conditions that require urgent clearance.

EMCa considers that using hourly rates to respond to emergency or urgent work is a reasonable approach. However, EMCa notes that the appropriateness of this contracting approach is highly dependent on the definitions of 'unforeseen conditions'

⁵⁰¹ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, pp. 26-28.

and 'emergency' or 'urgent' work. As discussed below, EMCa considers ActewAGL's approach resulted in it undertaking more emergency work than necessary.⁵⁰²

EMCa also highlights the importance of the commercial terms and conditions underpinning the contracting structure. In EMCa's opinion, ActewAGL was not constrained in its ability to negotiate commercial terms for vegetation clearance due to events such as higher rainfall, such that the application of an emergency clearance (that is, an hourly rate contract) approach would not be required.⁵⁰³

Evidence of a proactive vegetation management program

In our draft decision, we considered that, notwithstanding increased rainfall prior to 2012–13, ActewAGL seemed to be reactive in its vegetation management. This is due to much of urban vegetation management work on private land being conducted in 'urgent' circumstances. In these circumstances, ActewAGL is unable to recover costs directly from the customer.⁵⁰⁴

EMCa considers that whilst accelerated vegetation growth, resulting from higher than average rainfall was not controllable by ActewAGL, the extent of the impact on the network and the cost of mitigating the impact of vegetation on the network was controllable. Such control would have been an outcome of deploying good asset, risk and works program management practices.⁵⁰⁵

EMCa finds that ActewAGL's vegetation management policy and strategy documents do not explicitly include details of its risk assessment for vegetation. EMCa found no evidence that ActewAGL followed the precepts of its asset management strategy and policy or that it followed its risk management policy and procedures by proactively identifying that the high rainfall in 2010 posed a risk to network reliability and public safety.⁵⁰⁶

EMCa considers the initiatives ActewAGL introduced and implemented once it became aware of the impact of the above average rainfall in 2010 and 2011 on vegetation growth were either:⁵⁰⁷

- indicative of inherent inefficiencies in its vegetation management practices; and/or

⁵⁰² EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, pp. 26-28.

⁵⁰³ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 26-28.

⁵⁰⁴ AER, *ActewAGL draft decision Attachment 7: Operating expenditure*, November 2014, pp. 7-123–124.

⁵⁰⁵ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 31.

⁵⁰⁶ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 32.

⁵⁰⁷ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 32.

- not relevant to ActewAGL's handling of the record rainfall starting in 2010 and the efficiency of ActewAGL's vegetation management costs in 2012/13.

EMCa considers that more robust and effective vegetation inspection and project or program management practices, had they been in place, would have supported the monitoring and review cycle by identifying above budget volume and/or expenditure trends through regular performance reviews. Variances in lag and leading vegetation management indicators should have alerted ActewAGL's management that corrective action was required much earlier than it was eventually identified in mid-2012.⁵⁰⁸

EMCa also considered that the strategies outlined in the AER's final determination on ActewAGL's vegetation management cost pass through application would have significantly mitigated the cost of ActewAGL's vegetation management program.

As a result, EMCa considers ActewAGL's vegetation management practice and strategic and tactical responses were inadequate for 2012–13. Therefore, EMCa considers ActewAGL did not act prudently and efficiently to reduce the risks and costs associated with a prospective event of accelerated vegetation growth.⁵⁰⁹

Inspection and clearance process inefficiency

EMCa also found evidence of inadequate inspection and clearance processes. EMCa acknowledges that backyard reticulation would reasonably lead to higher vegetation management costs. However, evidence of systemic issues that indicate sources of inefficiency in vegetation management circa 2012–13 exist, including:⁵¹⁰

- inefficient office-field and field-to-office practices at an organisational level, likely to apply to vegetation management; and
- inefficient vegetation clearance practices.

In turn, inefficient work practices result in labour inefficiency through sub-optimal work planning and contracting arrangements (for example, excessive hourly rate contracting).

For example, ActewAGL has identified several productivity improvements going forward, including reducing 'urgent clearance' costs by 60 per cent (compared to the 2013–14 cost).

EMCa finds that ActewAGL is obliged to undertake vegetation clearance if the property owner fails to respond to a second clearance notice by ActewAGL. It is able to recover these costs from the property owner unless the work is undertaken in 'urgent

⁵⁰⁸ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 33.

⁵⁰⁹ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 33.

⁵¹⁰ EMCa, *Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13*, April 2015, p. 34-37.

circumstances'.⁵¹¹ However in 2012–13, ActewAGL undertook much of its clearance work under 'urgent circumstances' due, according to ActewAGL, to 'unforeseen' growth.

In these circumstances, ActewAGL has under-recovered legitimate costs by not proactively managing its vegetation management program, as discussed above.⁵¹²

Deterioration in vegetation management performance

EMCa considers the information provided by ActewAGL refutes our draft finding that ActewAGL's inefficient costs were due in part to inefficient vegetation management performance.⁵¹³ EMCa cites ActewAGL's submission that although the number of events has risen, rural SAIDI and SAIFI have significantly declined.⁵¹⁴

This finding, however, does not change EMCa's overall conclusions about ActewAGL's vegetation management costs adversely impacting on ActewAGL's 2012–13 base opex.⁵¹⁵

Category analysis

In our draft decision, the category analysis metrics suggested there may be inefficiencies in ActewAGL's opex requiring further review. We decided to review those categories in further detail. Having considered ActewAGL's submissions, we maintain the view that category analysis is useful as a diagnostic tool.

ActewAGL, in its revised proposal, submitted that certain category analysis metrics we presented in our draft decision were flawed.⁵¹⁶ ActewAGL submitted that the category analysis metrics do not corroborate our economic benchmarking results.⁵¹⁷ ActewAGL's views on our metrics include:⁵¹⁸

- they do not adequately take into account its unique circumstances, including labour mix, expenditure drivers, cost allocation and network characteristics
- they do not capture different maintenance requirements of assets in particular asset categories
- they ignore capex/opex trade-offs and input mix

⁵¹¹ ActewAGL, Operating and capital expenditure 'site visit' clarifications, October 2014, p. 36.

⁵¹² EMCa, Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13, April 2015, pp. 34-37.

⁵¹³ EMCa, Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13, April 2015, pp. 34-37.

⁵¹⁴ ActewAGL, Revised Regulatory Proposal 2015-19, Attachment C11, p. 34-37.

⁵¹⁵ EMCa, Review of ActewAGL Distribution's Labour Resourcing and Vegetation Management Practices at 2012/13, April 2015, pp. iii.

⁵¹⁶ ActewAGL Revised regulatory proposal: 2015–19 regulatory control period, January 2015, p. 188.

⁵¹⁷ ActewAGL Revised regulatory proposal: 2015–19 regulatory control period, January 2015, p. 205.

⁵¹⁸ ActewAGL Revised regulatory proposal: 2015–19 regulatory control period, January 2015, pp. 188–199.

- performance outcomes such as reliability and safety are not considered
- they are affected by data quality, the one-dimensional nature of the technique and assuming a linear relationship between inputs and outputs.
- While we acknowledge that category analysis inherently contains some of the limitations identified by ActewAGL, as discussed above, we are not using category analysis in the manner ActewAGL suggests. We consider that category analysis is suited to identifying areas for further review, not for determining opex forecasts. For this purpose, we do not require such precision in our metrics.
- The techniques that we do place significant weight on in determining opex forecasts, such as economic benchmarking, detailed review and operating environment factor assessment, appropriately take into account the above considerations.
- Further, in forming a view on the appropriate adjustment to ActewAGL's base opex, we have taken into account the potential for residual data, modelling and other uncertainties.

We comment below on some issues raised by ActewAGL and its consultants on specific category analysis metrics.

Overheads

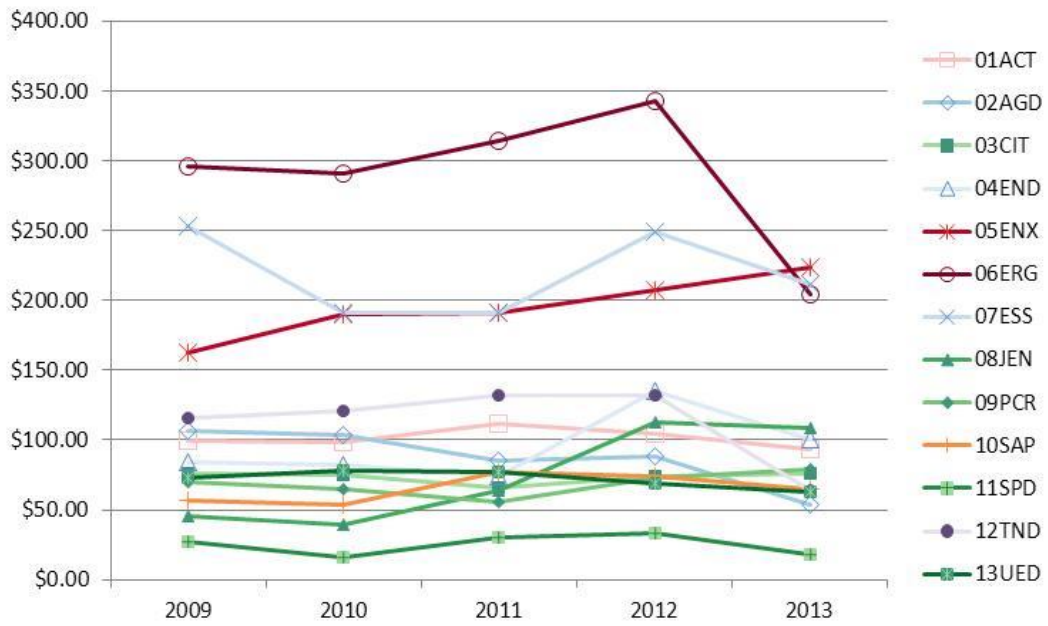
Following ActewAGL's submissions we have made one change to the conclusions from the overheads metrics. ActewAGL noted that we had classified their corporate and network overheads respectively as comparable relative to the other service providers, however we said their total overheads was high.⁵¹⁹ We presented three overhead metrics in the draft decision:⁵²⁰

- Corporate overheads per customer 2009 to 2013 (Figure A.10)
- Average network overheads per circuit km for 2009 to 2013 against customer density (Figure A.11)
- Average overheads per customer for 2009 to 2013 against customer density (Figure A.12).

⁵¹⁹ ActewAGL *Revised regulatory proposal: 2015–19 regulatory control period*, January 2015, p. 191.

⁵²⁰ AER, ActewAGL draft decision Attachment 7: Operating expenditure, November 2014, pp. 7-104–107.

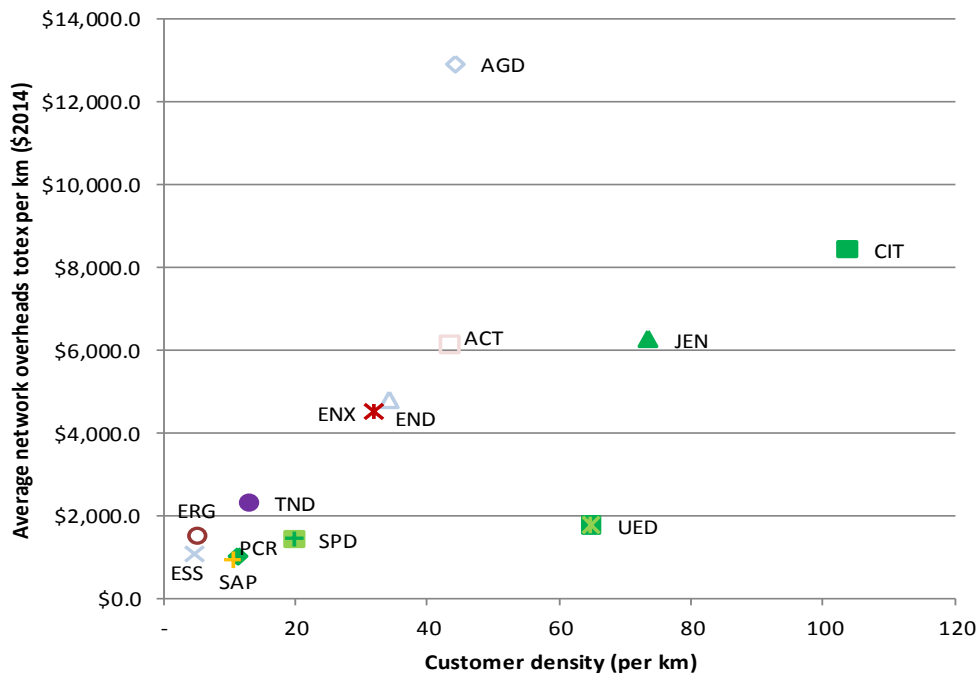
Figure A.10 Corporate overheads per customer 2009 to 2013 (\$2013–14)



Source: Category analysis RIN data and economic benchmarking RIN data.

We considered that ActewAGL had comparable corporate overheads per customer, based on Figure A.10. Our view is unchanged from the draft decision.

Figure A.11 Average network overheads per circuit km for 2009 to 2013 against customer density (\$2013–14)



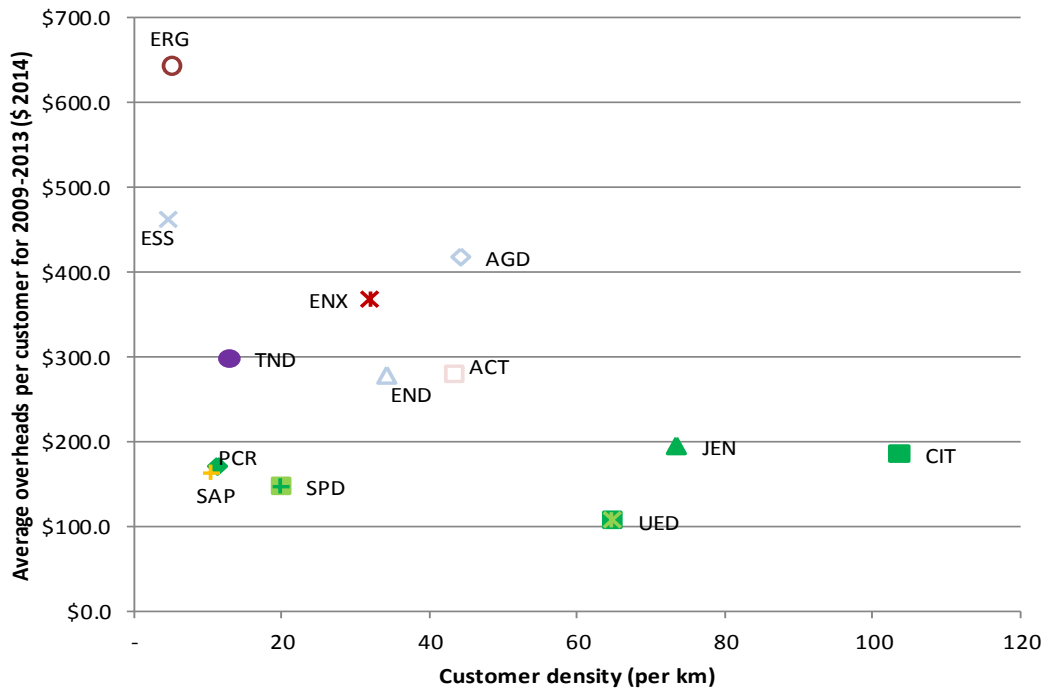
Source: Category analysis RIN data and economic benchmarking RIN data.

However, we consider that ActewAGL's network overhead should have been interpreted as 'high' rather than 'comparable' in our draft decision. We considered that ActewAGL had comparable network overheads per circuit km.⁵²¹ We stated that ActewAGL's network overhead was "...comparable to JEN but higher than UED, Energex and Endeavour Energy."⁵²²

Figure A.11 shows that although ActewAGL has a comparable network overhead to Jemena, Jemena has a higher customer density, which in theory requires greater network overheads to service more assets per circuit km. We would expect that ActewAGL's network overhead per circuit km to be lower than Jemena's, and therefore ActewAGL's network overhead should be considered 'high' based on Figure A.11.

We considered that ActewAGL's average total overheads per customer were high relative to other service providers, based on Figure A.12. This is because the Victorian and South Australian service providers (with varying customer densities) all have lower overheads per customer, within a relatively low band. Our view is unchanged from the draft decision.

Figure A.12 Average overheads per customer for 2009 to 2013 against customer density (\$2013–14)



Source: Category analysis RIN data and economic benchmarking RIN data.

⁵²¹ AER, ActewAGL draft decision Attachment 7: Operating expenditure, November 2014, p. 7-102.

⁵²² AER, ActewAGL draft decision Attachment 7: Operating expenditure, November 2014, p. 7-106.

We maintain that this interpretation is correct. It is a reflection of high network overheads, which we now conclude from Figure A.11.

Maintenance

For the reasons set out below, ActewAGL's submissions have not convinced us to change the maintenance metric.

ActewAGL's consultant Advisian considers that comparison of maintenance costs by circuit km alone is misleading.⁵²³ Advisian submit that other drivers such as route km, transformer numbers and transformer capacity are equally valid drivers of maintenance opex.⁵²⁴ They also consider that the 'frontier' businesses are at a substantial natural advantage, due to the relatively low volume of both line assets and transformer assets that they must maintain on a 'per customer' basis.⁵²⁵

We recognise that all service providers will have differences in assets and density, however we consider the differences in assets reflects to some extent the service providers' capital works program. The service provider has discretion over much of its capital works program, and may invest in more assets than an efficient and prudent service provider would require. These decisions will affect their maintenance costs. It does not, however, mean that service providers are not comparable on this metric. Nor do we agree that the frontier businesses are at a substantial natural advantage. We consider factors that may affect maintenance such as asset age and volumes in more detail in section A.6.

Vegetation management

For the reasons set out below, ActewAGL's submissions have not convinced us to change the vegetation management metric, notwithstanding we recognise issues with the metric.

ActewAGL refers to Advisian in critique of the vegetation management metric we presented in the category analysis section.⁵²⁶ Advisian submits that our proxy of overhead route line length understates the overhead route km on ActewAGL's network. It is understated because we subtracted underground circuit line length from total line length, where:⁵²⁷

- ActewAGL has a greater proportion of its network underground than any other service provider; and
- underground circuit length will be larger than underground route length.

⁵²³ Advisian, Opex cost drivers: ActewAGL distribution electricity (ACT), January 2015, pp. 74–75.

⁵²⁴ Advisian, Opex cost drivers: ActewAGL distribution electricity (ACT), January 2015, p. 75.

⁵²⁵ Advisian, Opex cost drivers: ActewAGL distribution electricity (ACT), January 2015, p. 75.

⁵²⁶ ActewAGL *Revised regulatory proposal: 2015–19 regulatory control period*, January 2015, pp.196–198.

⁵²⁷ Advisian, Opex cost drivers: ActewAGL distribution electricity (ACT), January 2015, p. 69.

Advisian submits that because we subtracted an inflated underground line length figure from total route line length, ActewAGL is adversely affected relative to most other service providers on our vegetation management metric.⁵²⁸

Ernst & Young, in a report provided with Ergon Energy's submission, also highlighted that the service providers have estimated route line length in alternative ways in the economic benchmarking RIN, which could call into question the comparability of the data.⁵²⁹

We recognise there are issues with the measurement of line length in this metric, and we treat the results of that metric with caution. However, as we note above, we have used category analysis as a diagnostic tool to assist with identifying key areas for further review. While the vegetation management metric may not be perfect, we do not agree that it is so flawed it cannot be used for deciding whether to consider ActewAGL's vegetation management expenditure and practices in further detail.

In addition, category analysis is not the only tool we have used to identify areas of opex for further review. ActewAGL's regulatory proposal noted the high amount of vegetation management expenditure in the base year referring to ActewAGL's previously submitted vegetation management cost pass through application.⁵³⁰ Based on the category analysis result and the additional material, we decided to investigate ActewAGL's vegetation management expenditure in more detail.

⁵²⁸ Advisian, Opex cost drivers: ActewAGL distribution electricity (ACT), January 2015, p. 69.

⁵²⁹ Ernst & Young, Briefing paper: RIN data review, February 2015, pp. 6–7.

⁵³⁰ ActewAGL, Vegetation management cost pass through, November 2013; ActewAGL, Regulatory proposal, July 2014, p. 218.

A.6 The net impact of operating environment factor adjustments

When undertaking a benchmarking exercise, circumstances exogenous to a service provider should generally be taken into account. By taking into account exogenous circumstances, one can determine the extent to which cost differences are exogenous or due to inefficiency.⁵³¹ The purpose of our assessment of operating environment factors (OEFs) is to account for these exogenous circumstances.

In its Final Rule Determination on the Economic Regulation of Network Service Providers The AEMC stated:

The final rule gives the AER discretion as to how and when it undertakes benchmarking in its decision-making. However, when undertaking a benchmarking exercise, circumstances exogenous to a NSP should generally be taken into account, and endogenous circumstances should generally not be considered. In respect of each NSP, the AER must exercise its judgement as to the circumstances which should or should not be included.⁵³²

The AEMC also noted that:

The intention of a benchmarking assessment is not to normalise for every possible difference in networks. Rather, benchmarking provides a high level overview taking into account certain exogenous factors. It is then used as a comparative tool to inform assessments about the relative overall efficiency of proposed expenditure.⁵³³

In the course of the current ACT, NSW, Queensland and SA regulatory determinations, we have considered more than 60 OEFs that we, service providers and other stakeholders have referred to. We considered each factor using our three OEF criteria of exogeneity, materiality, and duplication. We do not provide an adjustment for non-exogenous or duplicative factors. For material, exogenous and non-duplicative factors, we make an adjustment to the level of that materiality. If such a factor is immaterial, we take a different approach that nonetheless recognises that such factors may have an impact on a service provider, albeit a small one.

In response to our draft decision, ActewAGL submitted that our assessment of its operating environment factors was unsubstantiated.⁵³⁴

We have considered the OEFs raised by ActewAGL, other service providers and other stakeholders.

⁵³¹ Oakley Greenwood, *Review of NSW DBs Regulatory Submissions*, 5 August 2014, p. 16.

⁵³² AEMC, Rule Determination, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, November 2012, p. 113.

⁵³³ AEMC, Rule Determination, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, November 2012, pp 107-108.

⁵³⁴ ActewAGL, Revised Regulatory Proposal, 20 January 2015, p. 159.

We also consider that our approach to OEFs appropriately allows service providers to recoup at least efficient costs. In addition to adjusting for the material OEFs identified, we have provided an adjustment for the collective effect of immaterial OEFs that are exogenous and not accounted for elsewhere. Service providers receive positive 0.5 per cent adjustments for OEFs identified as immaterial that may disadvantage them or where there the direction of the advantage is uncertain. In future reviews, as we collect more information on OEFs, we are likely to adopt a stricter approach to the consideration of OEFs.

A.6.1 Final decision

We have provided an input margin of 23.0 per cent to ActewAGL to account for differences in operating environment factors (OEFs), not accounted for in Economic Insights' SFA model.⁵³⁵ We have come to this conclusion after assessing more than 60 different OEFs that we, service providers, and other stakeholders identified in the process of this review and in response to our benchmarking report.

We identified four OEFs that we consider require OEF adjustments. The first adjustment is to account for the effect of backyard reticulation. The second accounts for differences in capitalisations practices between service providers. The third accounts for the impact of different occupational health and safety regulations on service providers' opex. The fourth relates to service classification.

During the course of our investigations we identified additional OEFs that did not meet our OEF adjustment criteria because they would not create material differences in opex.

Although individually the effects of these OEFs on opex may not be material, their combined effect may be. To allow for the collective effect that these OEFs may have, we have provided an allowance of 4.4 per cent to ActewAGL. The method we used is discussed further in our OEF approach section.

Table A.6 below summarises the adjustments. Details on the calculation of each adjustment can be found below in the detailed discussions for each OEF.

⁵³⁵ The comparison firms are all service providers that score equal to or above the benchmark comparison point on Economic Insights' Cobb Douglas SFA benchmarking model, which is our preferred economic benchmarking method.

Table A.6 Summary of final decision on OEF adjustments

Factor	Adjustment	Reasons against OEF criteria ⁵³⁶
Capitalisation Practices	8.5%	<ul style="list-style-type: none"> Although capitalisation practices are the result of management decisions, differences in capitalisation practices can lead to material differences that are unrelated to efficiency. ActewAGL's capitalisation practices, with regard to vehicle and IT costs, provide it with a material cost disadvantage relative to the comparison firms. Economic Insights' SFA model does not include variables that account differences in capitalisation practices between the NEM service providers.
Backyard reticulation	5.6%	<ul style="list-style-type: none"> Backyard reticulation has been required by ACT planning approaches. ActewAGL has provided evidence that backyard reticulation materially increases its costs. Economic Insights' SFA model does not include variables that account for backyard reticulation between the NEM service providers.
Standard control services connections	4.0%	<ul style="list-style-type: none"> The AER determines service providers' service classifications. Standard control services connections opex accounts for a material amount of ActewAGL's standard control services opex. Economic Insights' SFA uses network services data. Connection services are not included in network services.
OH&S regulations	0.5%	<ul style="list-style-type: none"> OH&S regulations are not set by service providers. Data from the ABS and a PwC report commissioned by the Victorian Government suggest that differences in OH&S regulations may materially affect service provider's opex. Economic Insights' SFA model does not include a variable that accounts for differences in OH&S legislation.
Individually immaterial factors	4.4%	There are various exogenous, individually immaterial factors not accounted for in Economic Insights' SFA model that may affect service providers' costs relative to the comparison firms. While individually these costs may not lead to material differences in opex, collectively they may.
Total	23.0%	

Source: AER analysis.

⁵³⁶ Our OEF criteria, Exogeneity, materiality, and duplication, are explained in detail in our section on our approach to OEFs.

We have made several key changes since our draft decision. We have not included material OEF adjustments for the Energy Industry Levy because it will be recovered through the jurisdictional schemes mechanism rather than through the opex building block. The adjustment for capitalisation practices has decreased as ActewAGL will allocate more of its overhead costs to capex, relative to opex, in the forecast period than it has historically. We have also increased the adjustment for backyard reticulation on the basis of further information provided by ActewAGL.

We have considered all of the submissions made to us on OEFs, but not all service providers have had the same opportunities to provide information on the OEFs that affect their costs yet. We have sought information on some of the OEFs raised by the ACT, NSW and Queensland service providers from the Victorian service providers, but our review has focused on the OEFs in the context of the current decisions. The Victorian service providers have not yet had the same opportunity to present us their cost disadvantages. In future reviews we expect that the Victorian service providers and other stakeholders will provide further information on the effect of OEFs. These submissions may reveal cost advantages that ActewAGL has relative to the Victorian service providers. Cost advantages have the effect of decreasing the total adjustment made to a service provider's opex for OEFs. Therefore our current approach may favour the ACT, NSW, and Queensland service providers to the extent that not all of their cost advantages have been revealed.

In line with the AEMC,⁵³⁷ we have separated the analysed factors into five groups which are considered separately below:

- Customer factors
- Endogenous factors
- Geographic factors
- Jurisdictional factors
- Network factors.

A.6.2 Draft decision

In our draft decision we provided adjustments for operating environment factors (OEFs). We identified five material OEFs that required OEF adjustments. The first adjustment was to account for the effect of differences in capitalisation practices. The second accounted for the impact of different service classifications. The third accounted for backyard reticulation. The fourth accounted for differences in taxes and levies. The fifth accounted for differences in OH&S obligations across states. We also took into account the collective impact of immaterial factors on opex.

The table below summarises our draft decision on OEF adjustments.

⁵³⁷ AEMC, *Rule determination: National Electricity Amendment (Economic Regulation of Network Service Providers)*, November 2012, p. 113.

Table A.7 Summary of draft decision on OEF adjustments

Factor	Adjustment
Backyard reticulation	2.8%
Capitalisation practices	17.6%
OH&S regulations	0.5%
Standard control services connections	4.5%
Taxes and levies	2.3%
Individually immaterial factors	2.3%
Total	30%

Source: AER analysis.

A.6.3 Revised proposals and submissions

In response to our draft decision on operating environment factors (OEFs) we received submissions from ActewAGL, Ausgrid, Endeavour Energy, Ergon Energy, and Essential Energy. We also received submissions from their consultants and other stakeholders. We received submissions on the majority of the OEFs examined in our draft decision. Many of these submissions raised no new substantive issues. However, we did receive further substantive submissions on a number of the OEFs examined in the draft decision. We also received submissions on several new OEFs and on our approach to OEFs.

We received further submissions on:

- Asset Age
- Asset volumes
- Backyard reticulation
- Bushfire risk
- Capitalisation practices
- Customer density
- Economies of scale
- Environmental regulations
- Humidity and rainfall
- Line length
- Occupational Health and Safety regulations
- Proportion of wooden poles
- Subtransmission

New OEFs that were raised included:

- Activity scheduling
- Advanced Metering Infrastructure
- Communication networks
- Contaminated land management
- Critical National Infrastructure
- Cultural heritage obligations
- Demand management
- Environmental variability
- Line sag
- Network access
- Non recurrent costs
- Outsourcing
- Past ownership
- Reliability outcomes
- Rising lateral mains
- Safety outcomes
- Solar uptake
- SWER
- Termite exposure
- Transmission connection point charges
- Unregulated services

The following points on our approach were also raised:

- Non recurrent costs
- Treatment of endogenous factors
- Quantum of operating environment factors
- Quantum of the effect of material factors
- Quantum of the effect of immaterial factors

No substantive issues were raised on:

- Building regulations
- Capital Contributions
- Contestable services
- Corrosive environments

- Customer requirements
- Environmental regulations
- Extreme weather events
- Grounding conditions
- Topographical conditions
- Licence conditions
- Load growth
- Load factor
- Mix of demand to non-demand customers
- Planning regulations
- Population growth
- Proportion of 22kV and 11kV lines
- Ratio of underground to overhead lines
- Risk appetite
- Standard control services connections
- Shape factors
- Skills required by service providers
- Taxes and levies
- Temperature
- Topography
- Traffic management requirements
- Underground services
- Work and operating procedures
- Work conditions

We address all of the new evidence and further submissions presented to us in the relevant sections below. We have not repeated analysis for OEFs considered in the draft decision where no new substantive issues were raised.

Additionally, we have also considered OEFs raised by other service providers in their regulatory proposals and revised regulatory proposals. We have also considered submissions on those proposals where relevant. We have done this for consistency in our approach to OEFs and to capture the effect of relevant OEFs on ActewAGL's opex.

A.6.4 Approach to operating environment factors

It is important to recognise that service providers do not operate under exactly the same operating environment factors (OEFs). OEFs may have a significant impact on

measured efficiency through their impact on a service provider's opex. It is desirable to adjust for material OEF differences to ensure that when comparisons are made across service providers, we are comparing like with like to the greatest extent possible. By identifying the effect of OEFs on costs one can determine the extent to which cost differences are exogenous or due to inefficiency.⁵³⁸

Some key OEFs are directly accounted for in Economic Insights' SFA model. Where this has not been possible, we have considered the quantum of the impact of the OEF on ActewAGL's opex relative to the comparison firms. We have then adjusted the SFA efficiency scores based on our findings on the effects of OEFs.

We have accounted for OEFs using a two-step process. In the first step we have assessed whether an adjustment for an OEF would meet our OEF criteria: exogeneity, materiality, and duplication. In the second step, we assessed OEFs that met the exogeneity and duplication criteria to estimate the collective effect that they may have on service providers' opex. The purpose of the second step is to account for the effect of OEFs that do not meet the materiality criterion individually, but which do meet the criterion when considered collectively.

OEF assessment: Step one

Where an OEF meets all three of our OEF adjustment criteria we have provided an OEF adjustment. Our three OEF criteria are as follows:

1. **Exogeneity:** The first criterion is that an OEF should be outside the control of service providers' management. Where the effect of an OEF is within the control of service provider's management we would not generally provide an adjustment for the OEF.⁵³⁹ Adjusting for that OEF may mask inefficient investment or expenditure.
2. **Materiality:** The second criterion is that an OEF should create material differences in service providers' opex. Where the effect of an OEF is not material, we would generally not provide an adjustment for the factor. We do note, however, that we have provided a collective adjustment for individually immaterial factors.^{540 541}
3. **Duplication:** The third criterion is that the OEF should not have been accounted for elsewhere. Where the effect of an OEF is accounted for elsewhere, we have not

⁵³⁸ Oakley Greenwood, *Review of NSW DBs Regulatory Submissions*, 5 August 2014, p. 16.

⁵³⁹ AEMC, *Rule determination: National Electricity Amendment (Economic Regulation of Network Service Providers)*, November 2012, p. 113.

⁵⁴⁰ We have treated any OEF that will increase a service provider's opex by 0.5 per cent or more, relative to other service providers, as material. We chose 0.5 per cent as the materiality threshold because this is the materiality threshold we used in the Economic Benchmarking RIN. The materiality threshold relates to differences between the previous cost allocation method (CAM) and the current CAM. If service providers' current CAMs lead to material differences in reported opex compared to their past CAM, they are required to backcast their costs using their current CAM. The comparable threshold for preparing financial statements, in AASB 1031: Materiality, is between 10 and 5 per cent.

⁵⁴¹ We also note that irrelevant OEFs will also be captured by the materiality criterion. Where an OEF is not relevant, for example, it does not affect the comparison firms or the service provider being benchmarked, it will not lead to a difference in opex.

provided an adjustment for that factor. To do so would be to double count the effect of the OEF.^{542 543}

Given the nature of OEFs, as circumstances that differ between service providers, we have had to rely on a wide array of different information sources. For each OEF we have considered the evidence before us in making our conclusions. In some cases this has meant calculating the effect of OEFs using different types of data or methods. The calculation of OEF's below explains how we have taken this into account.

OEF assessment: Step two

In the second stage of our OEF assessment we have considered if each individually immaterial OEF, that meets the exogeneity and duplication criteria, will provide a cost advantage or disadvantage to the relevant service provider.

Where an individually immaterial OEF is likely to provide a cost disadvantage we have provided a positive adjustment equal to our materiality threshold, 0.5 per cent, in our collective adjustment for immaterial factors. We have also done this where there is some doubt about if an individually immaterial OEF will provide a cost advantage or disadvantage. Alternatively, where an individually immaterial OEF is likely to provide a cost advantage we have provided an OEF adjustment of negative 0.5 per cent in our collective adjustment for individually immaterial OEFs.

There is one exception to this. Where we have been able to quantify the effect of a factor that is individually immaterial we have only adjusted for the amount quantified. We consider that this provides a transparent and reasonable approach to estimating the effect of factors that individually may not be material but collectively may be.

We consider that this is an appropriately conservative approach. We note that the AEMC has stated that the purpose of benchmarking is not to normalise for every possible difference between networks. However, after considering the impact of more than 60 proposed OEFs, in addition to adjusting for 4 material OEFs, we have provided an adjustment for the collective effect of 20 immaterial OEFs. We consider it is appropriate to take this additional step in our benchmarking analysis given this is the first time we have applied benchmarking and the information on OEFs available to us at this stage. We also note that we have provided positive adjustments where the direction of advantage for immaterial factors is unclear. This is to allow service providers to recoup at least efficient costs incurred as a result of those immaterial OEFs, consistent with the revenue and pricing principles in the NEL. In future, as our information set improves we may reconsider our approach to immaterial OEFs.

⁵⁴² For example, Economic Insights' SFA model captures the effect of line length on opex by using circuit length as an output variable. In this context, an operating environment adjustment for circuit length would double count the effect of route line length on opex. Another example is that we exclude metering services from our economic benchmarking data. In this case, an operating environment adjustment would remove the metering services from services providers' benchmarked opex twice.

⁵⁴³ We also note that the SFA model uses dummy variables that account for all systematic differences in operating environments between the Australian and overseas service providers.

Table A.8 below provides a summary of the quantification of the effect of immaterial factors.

Table A.8 Summary of individually immaterial OEF adjustments

Factor	Adjustment
Asset lives	-0.5%
Bushfires	0.5%
Building regulations	0.5%
Corrosive environments	0.5%
Cultural heritage obligations	0.5%
Environmental regulations	0.5%
Environmental variability	-0.5%
Extreme weather events	-0.5%
Grounding conditions	0.5%
Humidity and rainfall	0.5%
Network access	-0.1%
Planning regulations	0.5%
Proportion of 11kV and 22kV lines	0.5%
Solar uptake	-0.5%
Specialised skills	0.5%
Termites	0.0%
Traffic management	0.5%
Transformer capacity owned by customers	0.1%
Topography	0.5%
Underground services	0.4%
Total	4.4%

Source: AER analysis.

OEF assessment: comparison point

To determine if an OEF provides a cost advantage, or disadvantage, to a service provider we first determine who the service provider is being compared to. For the purpose of estimating the effect of OEFs, the comparison point is the customer

weighted average of the service providers that score equal to or above the benchmark comparison point. This compares the service providers being benchmarked to all service providers at or above the benchmark point. This ensures that the operating circumstances of all the comparison firms are taken into account when assessing a service provider's base year opex. This allows a better estimate of service providers' underlying efficiency than a comparison to the service provider at the benchmark comparison point. Using the single firm at the benchmark comparison point could lead to OEF adjustments that unfairly advantage or disadvantage service providers.

For example, there may be a situation where there is an OEF that affects the service provider at the benchmark comparison point and other service providers above the benchmark comparison point differently. Providing an OEF based on a comparison to the service provider at the benchmark comparison point would lead to an OEF adjustment that would not reflect the broad variety of operating environments that the comparison firms operate in. This is because there are other service providers above the benchmark comparison point that may be advantaged or disadvantaged by the OEF under consideration. For this reason, as a comparison point for OEF assessment, we use the customer weighted average of all service providers that are at or above the benchmark comparison point.

OEF assessment: calculation of OEFs

We have had to estimate the impact of OEFs using different data sources. In some circumstances we have had access to the information required to estimate the incremental efficient cost of an OEF. In others we have only had the historical costs of the service provider being benchmarked to estimate the effect.

Where the efficient incremental costs can be estimated, the relevant OEF adjustment can be made in isolation. This is because the OEF adjustment is the percentage increase on the efficient costs estimated by the SFA model. An example is shown in Table A.9 below. The example shows how an adjustment would be calculated, using information on efficient costs, in the case that a service provider required a 50 per cent OEF adjustment.

Table A.9 Worked example of impact of an OEF where efficiency of costs has been demonstrated

Cost component		\$m 2013
Firm's costs including exogenous factor	A	\$150
Efficient costs estimated by SFA model	B	\$100
Cost incurred for OEF	C	\$50
OEF adjustment	$D=(B+C)/B-1$	50%
Forecast of efficient costs including OEF	$E=B*(1+D)$	\$150

Source: AER analysis

Where we only have information on the historical share of opex an OEF represents for the service provider being benchmarked,⁵⁴⁴ the OEF adjustment must be calculated with reference to the impact of other OEF adjustments. This change is made to translate the impact of the OEF on the service provider's historical costs, to the OEF adjustment to the efficient base year costs forecast by the SFA model.

This is done for two reasons. Treating the historical cost as fully efficient runs the risk of overcompensating the service provider. This is because those costs may contain some inefficiency. Additionally, if the impact of OEFs on historical opex is not taken into account, the OEF may over or undercompensate the service provider; depending on the direction of the adjustment. This is because the starting point to estimate the percentage change in opex due to the OEF will be affected by OEFs.

ActewAGL is affected by two OEFs where information on the efficient costs is not available: underground service lines and customer owned distribution capacity. The calculation of the adjustment to these factors can be found in the OEF summary spreadsheet attached to this decision.

In the following sections we consider the points raised by stakeholders in response to the OEF methodology used in our draft decision.

Treatment of endogenous circumstances

In response to our draft decision, ActewAGL submitted that controllable OEFs require OEF adjustments. ActewAGL submitted:

"ActewAGL Distribution considers that to be robust and informative benchmarking should recognise and quantify the impact of [...] controllable drivers of cost differences such as differences in accounting treatments and differences in work practices and operating techniques."⁵⁴⁵

Differences in work practices and operating techniques are endogenous. The AEMC provides guidance on what it considers to be an endogenous factor that should not be taken into account when benchmarking. It stated:

"Endogenous factors not to be taken into account may include:

- the nature of ownership of the NSP;
- quality of management; and
- financial decisions."⁵⁴⁶

Differences in opex due to work practices and operating techniques are a direct outcome of management decisions. Therefore we do not provide an OEF adjustment

⁵⁴⁴ In the case that there is no evidence to suggest those costs are efficient.

⁵⁴⁵ ActewAGL, Revised Proposal, 20 January 2015, pp. 157-158.

⁵⁴⁶ AEMC, Rule Determination, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, November 2012, page 113.

for them. In general we consider that any OEFs that are a result of the quality of management do not meet the exogeneity OEF criterion.

We do note that differences in accounting practices may lead to differences in opex that are unrelated to quality of management. As a result we have taken into account the effect of capitalisation practices in our benchmarking.

Non-recurrent costs

In response to our draft decision, ActewAGL raised the issue of non-recurrent costs included in ActewAGL's base year. ActewAGL considers that an OEF adjustment should be made for one off costs included in its base year.⁵⁴⁷

We are not satisfied that an OEF adjustment should be made for non-recurrent costs. Providing an OEF for non-recurrent costs would treat those costs as if they were recurrent. Economic Insights' benchmarking results are used as the basis for our forecast of opex. If we adjust the benchmarking results with an OEF adjustment for non-recurrent costs, it has the effect of including those non-recurrent costs in our opex forecast.

Additionally, an OEF adjustment for a non-recurrent cost would not meet the duplication OEF criterion. Economic Insights' SFA model takes non-recurrent costs into account. The SFA efficiency scores are based on the average performance of service providers over the period. Therefore the effects of transitory increases or decreases in relative opex efficiency are reduced. Also SFA modelling accounts for transitory variations in data using a compound stochastic variance term. This statistical technique accounts for random shocks in opex.⁵⁴⁸

Quantum of operating environment factors

In response to our draft decision, Huegin and Frontier Economics submitted that we have not taken into account all relevant OEFs.^{549 550} Frontier considers our examination of OEFs is incomplete because it does not cover all possible differences. Huegin considers that we have not provided detailed analysis or justification for deeming variables as insignificant, and that there is not adequate data available to conduct such tests. Huegin and Frontier also submitted that the AER's quantification of OEFs was arbitrary.^{551 552} However, Frontier and Huegin did not explain what elements

⁵⁴⁷ ActewAGL, Revised Proposal, 20 January 2015, pp. 160-161.

⁵⁴⁸ Aigner, D.J., C.A.K. Lovell and P. Schmidt, Formulation and estimation of stochastic frontier production function models, *Journal of Econometrics* 6, 21-37, 1977, p. 25.

⁵⁴⁹ Huegin, *Response to draft determination on behalf of NNSW and ActewAGL - Technical response to the application of benchmarking by the AER*, January 2015, pp. 51-52.

⁵⁵⁰ Frontier Economics, *Review of AER's econometric models and their application in the draft determination for Networks NSW*, January 2015, pp. xviii, 25-38, 91-95, and 98.

⁵⁵¹ Huegin, *Response to draft determination on behalf of NNSW and ActewAGL - Technical response to the application of benchmarking by the AER*, January 2015, p. 52.

of our OEF adjustment they considered arbitrary and as such it is difficult to respond to their criticisms.

We have examined more than 60 OEFs raised by service providers and other stakeholders, including those suggested by Huegin and Frontier.

We consider that we have accounted for all material differences. We have also accounted for some immaterial differences. We agree with Frontier that it is unlikely that we have covered all possible differences between the service providers, but this is not the purpose of our OEF adjustments. The AEMC has stated that the purpose of benchmarking is not to normalise for every possible difference in networks, but to provide a high level view of efficiency taking into account certain exogenous factors.⁵⁵³ Given the number of factors examined, and the incentives for service providers to identify factors that materially increase their costs, we consider it is likely that we have considered all factors that will materially affect ActewAGL's opex. Further, we have provided a quantification of immaterial factors which is at the upper bound of what we would expect to see on the basis of the information before us. Our benchmark comparison point also includes an appropriate margin for potential modelling, data, and other uncertainties.

Huegin did not provide any examples where we have not provided analysis or justification for deeming variables insignificant. Where quantitative data were available, we tested the materiality of the OEF using that data. Where qualitative information was provided we considered that; for example in our consideration of grounding conditions.

Quantum of material operating environment factors

In response to our draft decision Huegin, on behalf of the ACT and NSW service providers, submitted that our quantification of OEF adjustments, identified as material, is inaccurate and will not adequately compensate service providers. As an example Huegin submitted that the total dollar value of opex that our OEF adjustments provide ActewAGL is not sufficient to cover the costs that they actually incur in operating its subtransmission network and the change in their cost allocation method.⁵⁵⁴

The percentage of subtransmission in ActewAGL's network accounts is similar to those for the comparison firms. The costs relating to the cost allocation method change are now being recovered through the capex building block so it is not appropriate to provide an allowance for them through our benchmarking of base year costs. Our consideration of subtransmission and ActewAGL's change in cost allocation method

⁵⁵² Frontier Economics, *Review of AER's econometric models and their application in the draft determination for Networks NSW*, January 2015, p. 98.

⁵⁵³ AEMC, Rule Determination, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, November 2012, page 113.

⁵⁵⁴ Huegin, *Response to draft determination on behalf of NNSW and ActewAGL - Technical response to the application of benchmarking by the AER*, January 2015, pp. 51-52.

are considered in our consideration of subtransmission and capitalisation practices respectively.

Huegin also notes that we have made adjustments to the frontier target rather than the input opex.⁵⁵⁵ We have done both depending on the information available to us. However, regardless of the method we have used, our OEF adjustments provide a sufficient amount for service providers to recover the efficient costs associated with their OEFs. This is explained in our calculation of OEFs section above.

ActewAGL submitted that our approach to OEF's is circular.⁵⁵⁶ ActewAGL submitted:

Constructing a substitute base year opex by applying an inefficiency factor to the OEF's assumes before-hand that ActewAGL Distribution is inefficient. The AER's approach is circular. The AER assumes (for the purposes of OEF adjustments) that ActewAGL Distribution is inefficient to construct a comparative benchmarked efficiency score, which is then deployed to conclude that ActewAGL Distribution is inefficient relative to other DNSPs.

This is not entirely correct. While a service provider's benchmark efficiency score may be lower than it would be if it were not affected by OEFs, it will be able to recoup all of its efficient costs under our approach. This is explained our calculation of OEFs section above.

ActewAGL also submitted that the AER cannot assume that any inefficiency found in a component of opex can be found in others.⁵⁵⁷ Our approach to OEF adjustments does not assume inefficiency found in a part of ActewAGL's opex can be found in others. Our approach to OEF adjustments applies the estimated level of total opex efficiency to OEF adjustments where there is no evidence that expenditure associated with an OEF is more or less efficient than the service provider's total opex efficiency.

Quantum of immaterial operating environment factors

ActewAGL, and the consumer challenge panel, submitted that they consider our quantification of the effect of immaterial factors is arbitrary.^{558 559}

In our draft decision, we exercised our regulatory judgement and provided the ACT and NSW service providers with an adjustment for OEFs that we had found to be immaterial. We did this because the precise quantum of the immaterial factors may not be possible to estimate accurately in all cases. We decided to take an appropriately conservative approach, and provided ActewAGL an uplift on the quantum of the identified material factors to 30 per cent.

⁵⁵⁵ Huegin, *Response to draft determination on behalf of NNSW and ActewAGL - Technical response to the application of benchmarking by the AER*, January 2015, pp. 51-52.

⁵⁵⁶ ActewAGL, *Response to information request AER065*, 31 March 2015, p. 2.

⁵⁵⁷ ActewAGL, *Response to information request AER065*, 31 March 2015, p. 2.

⁵⁵⁸ ActewAGL, *Revised Proposal*, 20 January 2015 p. 161.

⁵⁵⁹ Consumer Challenge Panel, *Consumer Challenge Panel (CCP2 Panel) Submission on Energex and Ergon Energy Capex and Opex Proposals*, 30 January 2015, p. 21-23.

Having regard to the submissions made on this approach, and in the interest of regulatory consistency and transparency, we have decided to change our approach to quantifying the effect of immaterial OEFs. Our new approach to quantifying the combined impact of immaterial factors is explained in detail in the OEF approach section above.

A.6.5 Customer factors

Customer Density

We are not satisfied that an OEF adjustment for customer density would meet the duplication OEF adjustment criterion. The effect of customer density is captured by variables in Economic Insights' SFA model.

We adopted the same position in our draft decision.

In response to our draft decision we received several submissions from service providers and their consultants on customer density. CEPA, Huegin, and Advisian submitted that linear density fails to adequately capture the cost disadvantage faced by rural networks.^{560 561 562}

CEPA considered a spatial density variable should be used because it is generally significant in its models.

Huegin considered that linear density does not appropriately account for differences in customer density because it considers linear density does not account for:

- intra-network differences in density
- differences in meshed and radial designs and
- the increase in decentralised service functions required to service a larger area.

Advisian submitted that linear density will not account for differences in customer density because:

- spatial and linear density are not highly correlated
- more decentralised service functions are required to service a larger area and
- a study by London Economics and PowerNex found the effect of spatial density to be significant.

We are not satisfied that linear density is insufficient to capture the effects of customer density. This is because opex will be driven by the length of line that must be maintained rather than the area that the service provider nominally covers. Using a

⁵⁶⁰ CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (ActewAGL), p. 24.

⁵⁶¹ Huegin, Huegin's response to draft determination on behalf of NNSW and ActewAGL, 16 January 2014, pp. 45-46.

⁵⁶² Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 36-45.

measure of spatial density may cover nominally servicing areas in which a service provider has no assets or customers. An example of this, provided by Economic Insights, is the Northern Territory distributor: Power and Water Corporation.⁵⁶³ Nominally, Power and Water Corporation's service area is all of the Northern Territory.⁵⁶⁴ In reality, Power and Water Corporation's electricity distribution network covers Darwin and Katherine (with a transmission line between the two) on its main network with smaller networks around the Territory serviced mostly by isolated, diesel generator-based systems.⁵⁶⁵ Therefore measuring customer density using Power and Water Corporation's nominal service area would provide a misleading picture of the customer density of Power and Water Corporation's network.

This also applies to the consideration of Ergon Energy, Essential Energy, and SA Power Networks. Although Ergon Energy is nominally responsible for electricity distribution across all of Queensland (except South East Queensland), there are large parts of western Queensland where it has no assets. Similarly, there are parts of western NSW and the great dividing ranges that are nominally part of Essential's service area, but to which Essential provides no services. There are also large parts of northern South Australia where SA Power Networks has no assets.

We are not satisfied that differences in intra-network density will materially affect Economic Insights' SFA benchmarking results. All service providers will have variations in density within their networks. To the extent that a network has a greater number of lines per customer than other services, this will be captured in customer density at the total level. Huegin has not provided sufficient evidence to demonstrate that intra-network variations will materially affect costs across service providers. Huegin's measure of population dispersion multiplies the number of dwellings in each location by the distance of that location from the state capital. This metric assumes it is necessary to supply each location directly from the state capital. However, each location is not supplied directly from the state capital. Therefore, Huegin's measure is likely to overstate the effect of population dispersion, particularly for larger states. This is because larger states will have more locations far from their state capital, regardless of their density.

We are not satisfied that the variables in Economic Insights benchmarking SFA model are insufficient to account for differences in costs between meshed and radial network designs. Lower density areas will tend to be serviced by radial hub and spoke networks. Higher density areas will tend to be serviced by meshed networks. As Economic Insights SFA model accounts for linear density we consider that it does account for differences in radial and mesh network designs.

⁵⁶³ Economic Insights, April 2015, pp. 14-15.

⁵⁶⁴ Power and Water Corporation, About Power and Water, available at: https://www.powerwater.com.au/about_power_and_water [last accessed 9 March 2015].

⁵⁶⁵ Power and Water Corporation, Electricity Map, available at: https://www.powerwater.com.au/community_and_education/student_resources/maps/electricity_map [last accessed 9 March 2015].

We are satisfied that Economic Insights' SFA model accounts for the decentralised costs associated with operating hub and spoke distribution networks. This is because a hub and spoke distribution network will have more circuit length per customer. Economic Insights' SFA model uses circuit length as an output variable. As the circuit length variable increases so does opex. The increase in the circuit length variable will therefore compensate service providers for the additional circuit length they must operate.

We also consider that the study by London Economics and PowerNex Associates does not provide evidence that linear density does not capture the effects of spatial density. The study finds that linear density and customer density can both be used to explain the relationship between cost and customer density. However, the study does not conclude that one measure is better than the other for measuring the relationship between cost and density. We also consider that the results from the London Economics and PowerNex Associates models are not appropriate for estimating the magnitude of the effect of customer density on costs. This is due to the model specifications used and their results. The models use one output, customer numbers, and two density measures (customer density and energy density), which we consider are insufficient to properly capture the output dimensions. Evidence for this is that some of the estimated coefficients have the opposite sign as would be expected (energy density) or implausible values (customer numbers).⁵⁶⁶

In response to CEPA's observation that it found spatial density to be a significant explanatory variable, we consider that one should not include variables solely on the basis they appear to have statistically significant explanatory power. Including a variable without a sound economic basis behind it has the opportunity to produce misleading results. We are not satisfied that there is a sound intuition behind including a variable for spatial density. As discussed above including a variable for spatial density has the potential to forecast an increase in opex for servicing areas where service providers have no assets.

Network length

We are not satisfied that an OEF adjustment to account for differences in network length would meet the duplication OEF adjustment criterion. To the extent that line length has an effect on costs, Economic Insights' SFA model accounts for that effect. Economic Insights' SFA model accounts for differences in line length as it includes circuit length as an output variable.

Network length is the length of a service provider's network. It can be measured using route line length or circuit line length. Route line length is distance between service providers' poles. Circuit line length is the length of lines in service, where a double

⁵⁶⁶ London Economics International and PowerNex Associates, Customer Density and Distribution Service Costs, 11 November 2011, p. 12.

circuit line counts as twice the length. All else equal, the longer a service provider's network length is the more costs it will incur.

Advisian considered that the results of Economic Insight's SFA model on line length are not intuitive.⁵⁶⁷ The example that it gives is that all else being equal the Economic Insights SFA model assumes that Ausgrid requires 60 per cent of the opex per meter that CitiPower requires and Endeavour requires 44 per cent per meter.

Line length is not the only output produced in providing electricity distribution services. The intuition behind the model is that if line length increases without customer numbers and demand increasing, the amount that a service provider will need to spend per meter of line will decrease. This makes sense because the service provider will not have to provide extra transformer capacity or customer service for the additional line length. This demonstrates that one would not expect there to be a one to one relationship between line length and cost, all else being equal. If there were a one to one relationship between cost and line length, then electricity distribution with multiple outputs would exhibit decreasing returns to scale when considering all inputs.

Advisian also noted that the opex a service provider will incur per km of circuit will be affected by the number of poles it has.^{568 569} Advisian noted that urban comparison firms have fewer poles per customer than their NSW or ACT counterparts. It also noted that Essential has more poles per customer than the rural comparison firms.⁵⁷⁰ This would be expected. Essential has more lines per customer than the rural comparison firms so it would typically also have more poles. Similarly, one would expect that ActewAGL, Ausgrid and Endeavour to have more poles per customer than the urban comparison firms because they have more lines per customer. We do note however, that United Energy has a similar number of poles per customer as Ausgrid and ActewAGL despite having higher customer density. This is likely due to the fact that it has a lower level of undergrounding.

Economic Insights' SFA model accounts for the number of poles per customer through customer density effects and the inclusion of a variable for undergrounding. We discuss the effects of customer density in detail in our customer circumstances section. Undergrounding was discussed in our draft decision.

Economies of scale

We are not satisfied that it is necessary to provide an OEF adjustment for economies of scale. It does not meet the duplication OEF adjustment criterion. An adjustment for economies of scale is unnecessary because the Cobb Douglas functional forms, which is used in Economic Insights' SFA model, accounts for economies of scale. This is because the Cobb Douglas function permits the estimation of the cost elasticities of the

⁵⁶⁷ Advisian, Review of AER benchmarking: Networks NSW, 16 January 2015, pp. 41 -42.

⁵⁶⁸ Advisian, Review of AER benchmarking: Networks NSW, 16 January 2015, p. 43.

⁵⁶⁹ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, p. 48.

⁵⁷⁰ The rural comparison firms are: AusNet Services, Powercor, and SA Power Networks.

output variables. Further details on how the SFA model accounts for economies of scale can be found in our draft decision.⁵⁷¹

In our draft decision we did not provide an OEF adjustment for economies of scale because the SFA model accounts for economies of scale as discussed above.

In response to our draft decision ActewAGL and its consultant, Advisian, raised the issue of economies of scale.^{572 573} Advisian submitted that because ActewAGL is geographically isolated it does not have the ability to pursue mergers and cooperative arrangements with other service providers. Advisian submitted that this affects ActewAGL's ability to access economies of scale in primarily two ways: it prevents ActewAGL from being able to share management functions and share operational functions. However, Advisian did not provide evidence to suggest the Cobb Douglas functional form does not account for economies of scale.

Advisian provided eight examples of management functions that CitiPower and Powercor share. Of these functions five are general corporate functions, two are general corporate functions with electricity specific applications (OH&S and Training), and one is electricity distribution specific (System Operation). To adjust for these shared functions Advisian recommended increasing reported corporate overheads, as reported in the category analysis RINs, by 50 per cent for CitiPower and Powercor. Advisian provided no quantitative data or qualitative evidence to support the quantum of the adjustment. Advisian then calculated an adjustment to ActewAGL's base opex on the premise that the adjustment to CitiPower and Powercor opex will lower the frontier to which ActewAGL is being benchmarked.

Advisian also noted that CitiPower/Powercor and Jemena/United Energy shared network control centres over the benchmarking period. Advisian considered that this provided these businesses with a cost advantage. As with shared management functions, Advisian estimated the cost advantage of sharing network control functions by increasing the Network operations & switching opex by 50 per cent. Advisian provided no quantitative data or qualitative evidence to support the quantum of the adjustment. Advisian then provided an adjustment to ActewAGL's base opex as it did for shared management functions.

These points raised by Advisian do not address the fact that the Cobb Douglas functional form accounts for economies of scale.

While ActewAGL may not have the same access to economies of scale, we note that ActewAGL has access to greater economies of scope than most of the comparison firms. ActewAGL can share management and operational functions with its related corporations. ActewAGL has the ability to share management and operational

⁵⁷¹ AER, Draft Decision ActewAGL distribution determination 2014–19 Attachment 7: Operating expenditure, November 2014, p. 98.

⁵⁷² ActewAGL, Revised Proposal, 20 January 2015, p. 200.

⁵⁷³ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 86-92.

functions with its parent companies: ACTEW Corporation and Jemena.⁵⁷⁴⁵⁷⁵ ActewAGL shares functions with its gas division, its retail partnership, and ACTEW Water. Across its electricity (182,458),⁵⁷⁶ gas (137,806),⁵⁷⁷ and water networks (163,000)⁵⁷⁸ ACTEW Corporation has 483,264 connections. Additionally, ActewAGL shares customer billing functions with its retail partnership with ACTEW Corporation.

We also note that, although ActewAGL does not share its network control centre with another service provider, the cost of operating the network control centre is only a small part of network control and switching costs. Advisian's adjustments overestimate the effect of the advantage of sharing a network control centre. Advisian's adjustment uses total network control and switching costs to estimate the cost advantage of sharing a network control centre. The cost of operating the network control centre is only a small part of those costs.

In addition, ActewAGL has the advantage of being a vertically integrated distributor. None of the comparison firms can share customer service and billing functions with a retailer. ActewAGL shares customer billing functions across its gas, water, electricity, and retail functions with ACTEW Corporation through its retail partnership⁵⁷⁹

A.6.6 Endogenous factors

Activity scheduling

We are not satisfied that an OEF adjustment for differences in activity scheduling would meet the exogeneity OEF adjustment criterion. How a service provider chooses to schedule its business processes is a management decision.

Activity scheduling is the scheduling of routine network inspection and maintenance activities.

Ergon Energy's consultant Huegin, submitted that activity scheduling will lead to cost differences across service providers.⁵⁸⁰ Huegin stated that a high degree of maintenance costs for service providers are preventative activities such as inspections. The scheduling of inspections will determine the workload, and therefore costs of those preventative activities.

⁵⁷⁴ ActewAGL shares management functions with its gas division and also Actew Corporation. ActewAGL provides corporate services to ACTEW Corporation. Also Zinfra Group, a subsidiary of Jemena provides asset management, engineering and design, project management, construction, civil works, maintenance, and asset operations across Australia.

⁵⁷⁵ ActewAGL could also share operational functions with its gas division and Actew Corporation. Examples of this include civil works to lay or augment underground water, gas, and electricity mains and reinstatement works.

⁵⁷⁶ ActewAGL, AAD Annual Planning Report 2014, December 2014, p. 9.

⁵⁷⁷ ActewAGL, ActewAGL: Our year in review 2013–14, p. 4.

⁵⁷⁸ Actew Corporation, *Annual Report 2013–14*, p. 18.

⁵⁷⁹ ActewAGL, Annual Report 2012–13, p. 4.

⁵⁸⁰ Huegin, Ergon Energy Expenditure Benchmarking, 17 October 2014, p. 14.

How frequently a service provider chooses to inspect its assets is a management decision. We note that some environmental conditions may lead to more frequent asset inspections or maintenance. We have considered these environmental conditions as they have been raised by stakeholders. Examples of these include asset age and humidity.

Capitalisation practices

We are not satisfied that an OEF adjustment for differences in capitalisation practices between ActewAGL and the comparison firms is appropriate. Although an adjustment for differences in capitalisation practices does not satisfy the exogeneity OEF adjustment criterion, not adjusting for differences in capitalisation policies may penalise ActewAGL for actions unrelated to efficiency.

For clarification, capitalisation practices include both service providers decision on the relative quantity of capital and operating costs and also the policies service providers use to classify costs as assets or expenses. Using different mixes of assets and expenses to provide will affect the operating expenditure a service provider incurs. Differences in the policies service providers use to classify costs as assets or expenses will affect the opex service providers record. Both of these have the potential to affect service providers' efficiency scores in Economic Insights SFA model. However, choices on capital inputs and accounting policies are management decisions so would not satisfy the exogeneity OEF criterion. Nonetheless, because these differences may lead to differences in costs unrelated to efficiency, we have treated this OEF as if it satisfies the exogeneity OEF criterion.

In our draft decision we provided ActewAGL an OEF adjustment for capitalisation of 17.6 per cent. This adjustment was made on the basis that during the benchmarking period ActewAGL expensed more costs than other service providers. ActewAGL identified some differences between its capitalisation practices and the comparison firms. ActewAGL changed its cost allocation method which resulted in \$9.9 million (\$2013–14) of overheads being allocated to capex instead of opex.⁵⁸¹ It also expenses vehicle and computer costs. These accounted for 3.1 million (\$2013–14) in its base year.⁵⁸² Together these costs represent 17.6 per cent of ActewAGL's base year opex.⁵⁸³ We based the adjustment on the percentage of opex the costs identified rather than their absolute value. We considered that the costs identified would contain the same inefficiencies identified in other parts of ActewAGL's opex. As a result the adjustment provided ActewAGL with 5.76 million (\$2013–14) instead of the identified \$13 million (\$2013–14).

Since our draft decision, ActewAGL,⁵⁸⁴ Advisian,⁵⁸⁵ CEPA,⁵⁸⁶ the Consumer Challenge Panel,⁵⁸⁷ Energex,⁵⁸⁸ Ergon Energy,⁵⁸⁹ Frontier,⁵⁹⁰ SA Power Networks,⁵⁹¹ and the

⁵⁸¹ ActewAGL, 20141023_Opex_CAM_adjustment_calculation.xls, 23 October 2014.

⁵⁸² ActewAGL, Capital and operating expenditure 'site visit' clarifications, 3 October 2014, p. 11.

⁵⁸³ When the CAM adjustment is reversed.

⁵⁸⁴ ActewAGL, *Revised Regulatory Proposal*, 20 January 2015, pp. 142-413.

NSW Service Providers^{592 593594} have all raised the issue of the effect of capitalisation practices on benchmarking.

ActewAGL CEPA, and SA Power Networks specifically noted that differences in the allocation of overheads will affect Economic Insights' benchmarking results. Advisian considered that the AER should adjust the comparison firms for their capitalisation practices. The Consumer Challenge Panel considered that NSW and Queensland service providers' access to low cost debt funding would make the AER's approach to capitalisation overly generous.⁵⁹⁵ Frontier noted that differences in accounting approaches and capital utilisation would affect Economic Insights' benchmarking results. The NSW service providers stated that the AER had not analysed the effects of capitalisation policies.

ActewAGL and its consultant, Advisian, did not consider that our approach to capitalisation adequately accounts for its differences in its capitalisation policy, relative to its peers, over the benchmarking period.^{596 597} They both consider that the adjustment that we provided only incorporates half of the effect of the differences in practices identified. Advisian also noted another difference in capitalisation practices between ActewAGL and the comparison firms relating to the capitalisation of pole top structure replacement.⁵⁹⁸ Prior to March 2012, AAD treated urban pole top structure replacements primarily as a maintenance task and consequently reported the associated costs as an operating expense.

After considering all of these submissions, we are satisfied that our initial approach remains appropriate. We agree with Frontier Economics that differences in accounting practices and capital utilisation will affect service providers' capitalisation rates. We also consider that the relative efficiency of service providers' opex and capex programs and their position in their asset replacement cycle will affect service providers' opex capex ratio. Some of these factors are related to service providers' efficiency and some are not. As a result we will only provide material adjustments to service provider's benchmarking results where their opex as a percentage of total capital and operating

⁵⁸⁵ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, p. 76.

⁵⁸⁶ CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (ActewAGL), 2015, p. 11.

⁵⁸⁷ Consumer Challenge Panel, Submission to the AER: Responding to NSW draft determination and revised proposals, February 2015, p. 51.

⁵⁸⁸ Energex, Response to Information Request EGX001, 17 December 2014, pp. 7-8.

⁵⁸⁹ Ergon, Response to Information request ERG002, 19 December 2014, p. 20.

⁵⁹⁰ Frontier Economics, Review of the AER's econometric models and their application in the draft determination for Networks NSW, January 2015, pp. 52-55 and p. 91.

⁵⁹¹ SA Power Networks, Response to information request SAPN 004, 19 December 2014, p. 13.

⁵⁹² Ausgrid, Revised Proposal, 20 January 2015, p. 147.

⁵⁹³ Endeavour Energy, Revised Proposal, 20 January 2015, p. 174.

⁵⁹⁴ Essential Energy, Revised Proposal, 20 January, p. 187.

⁵⁹⁵ Consumer Challenge Panel, Submission to the AER: Responding to NSW draft determination and revised proposals, February 2015, p. 51.

⁵⁹⁶ ActewAGL, Revised Regulatory Proposal, 20 January 2015, p.160.

⁵⁹⁷ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 75-83.

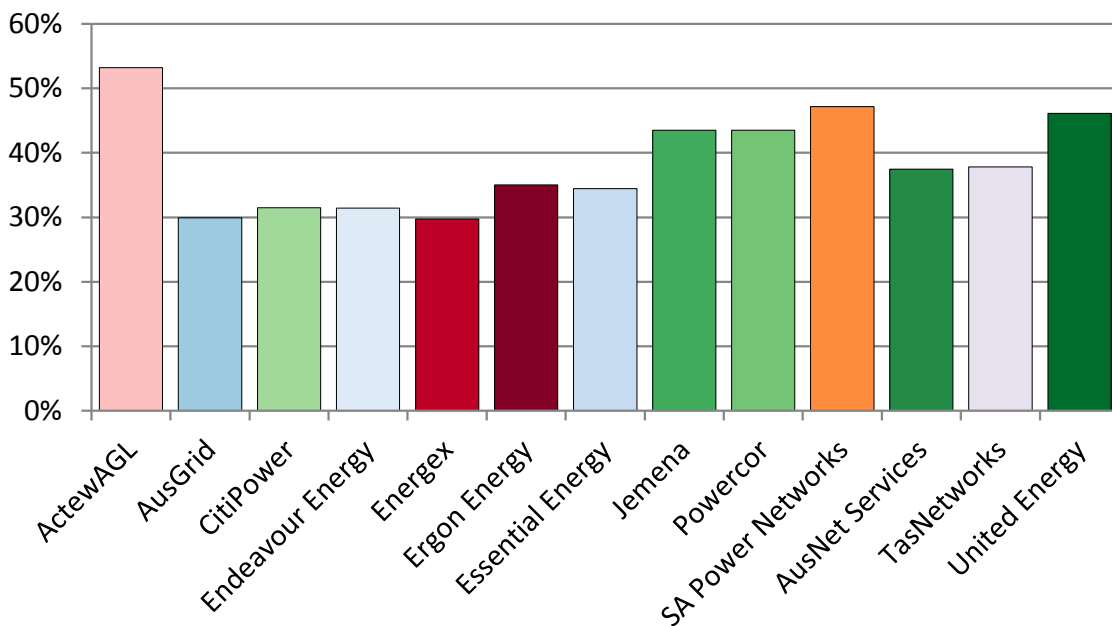
⁵⁹⁸ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 78-79.

expenditure (totex) is not broadly consistent with its peers'; as we have done for ActewAGL. We also note that the results of Economic Insights' MTFP benchmarking are broadly consistent with the results of its parametric benchmarking. MTFP estimates productivity across both capex and opex. Similar results on opex benchmarking and MTFP indicate the opex benchmarking results are not heavily influenced by capitalisation practices.

We are not satisfied that it is necessary to make adjustments to all of the service providers in the sample to adjust for differences in the reported allocation of overheads to opex and capex. The method in which service providers allocate direct costs between capex is also likely to affect capitalisation rates. As a result rather than focusing on indirect costs it is better to compare the ratio of total opex to total capex. This measure will take into account the allocation of overheads between opex and capex, but also other factors such as opex capex trade-offs.

Figure A.13 below shows that opex made up between 30 to 45 per cent of totex for most NEM service providers during the benchmarking period, with ActewAGL expensing more of its totex than any other service provider. As ActewAGL was an outlier, we provided an adjustment for its capitalisation practices.

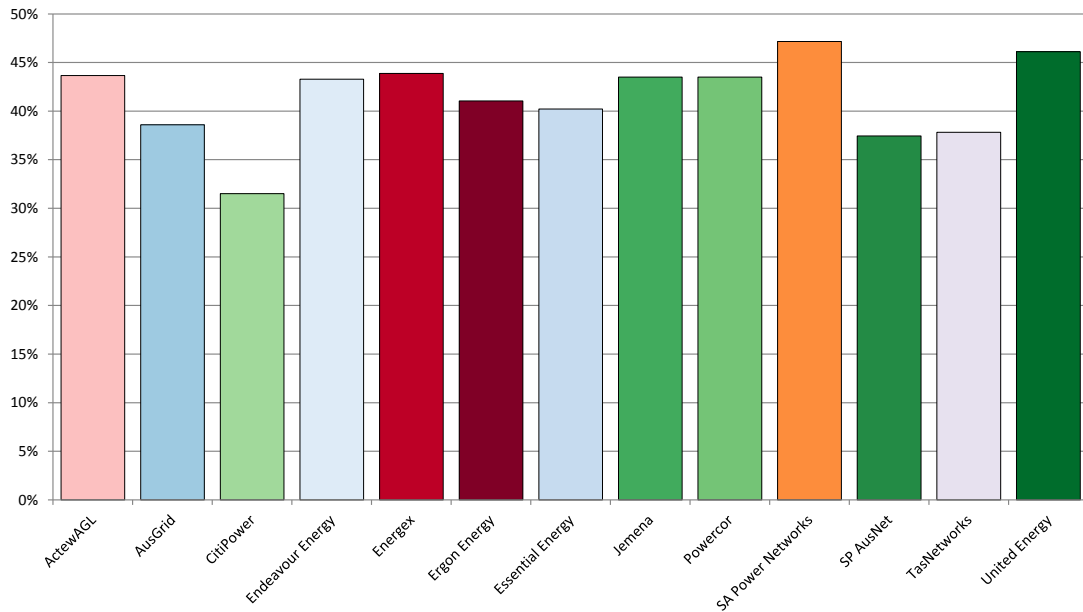
Figure A.13 Average opex as a percentage of totex, 2006 to 2013



Source: Economic benchmarking RIN

Figure A.14 below shows opex as a percentage of totex in the forecast period for the ACT, NSW, and Queensland service providers. Figure A.14 also shows opex as a percentage of totex for all other service providers during the benchmarking period. We note that, after our final decision adjustment for capitalisation, the forecast of ActewAGL's opex as a percentage of totex (43.7 per cent) is similar to the customer weighted average for the comparison firms (42.5 per cent).

Figure A.14 Forecast opex as a percentage of totex for ACT, NSW and Queensland service providers (2014-19 and 2015-20), and average actual opex as a percentage of totex for other service providers (2006 to 2013).



Source: Economic Benchmarking RIN responses 2006 to 2013; AER Analysis

Note: Opex as a percentage of totex is based on standard control services costs for the forecast expenditures. It is based on network services for the historical expenditures. This is because we do not forecast capex for network services. We forecast capex for standard control services only.

Taking ActewAGL and its consultant's submissions into account we have reconsidered our position on the OEF adjustment for capitalisation practices. We consider that an adjustment of 8.5 per cent is appropriate. The change is attributable to two parts; a reallocation of the change in overhead allocation to capex and an increase in the adjustment for differences in IT and vehicle leasing. We have not provided any adjustment for differences in pole top structure replacement.

In the draft decision we provided an OEF adjustment for the change in overhead allocation policy. Economic Insights' benchmarking results are used as the basis for our forecast of opex. By adjusting the benchmarking results with an OEF adjustment for the change in overhead allocation policy we included overheads that would be capitalised in the forecast period in our forecast of opex. We did not adjust ActewAGL's capex for the increase in overheads that would be allocated to capex. ActewAGL was receiving those overheads in its base opex.

In our final decision we have not provided an OEF adjustment for the change in overhead allocation policy. We have reallocated these costs to ActewAGL's capex allowance. This is because a forecast of opex that includes capex would not reasonably reflect the efficient opex required by a prudent and efficient service provider.

We asked ActewAGL for its view on providing an OEF adjustment for its change in Cost Allocation Method (CAM) if we were to provide an increase in overhead costs in capex due to the reallocation of overheads. ActewAGL submitted:

"that by retrospectively adjusting ActewAGL Distribution's historical benchmarked efficiency in the 2012/2013 base year to account for its future CAM in the current regulatory control period, the AER would be undermining the integrity of its benchmarking analysis."⁵⁹⁹

The change represents the removal of a factor that will lead to differences in cost. By adopting a practice similar to its peers ActewAGL no longer requires an OEF adjustment. Therefore as the difference does not exist in the forecast period, it is not appropriate to make an adjustment for it.

In our final decision, we have provided an adjustment of 8.5 per cent based on the total costs ActewAGL identified as associated with leasing IT and vehicles. We have considered Advisian's advice that costs associated with operating leases reflect fixed costs and consider that it has some merit. We note that IT and vehicle costs are generally treated as non-network costs. In general we assess non-network costs based on their historical trend and where we identify areas of concern we conduct an engineering review. We identified no areas of concern with ActewAGL's non-network capex. As vehicle and IT costs are usually treated as non-network capex, in the absence of contrary evidence we consider that ActewAGL's expenditure on operating leases reflects prudent and efficient expenditure. If the cost of operating leases in 2012/13 are added to the efficient opex forecast by Economic Insights' SFA model, it leads to an increase of 8.5 per cent in opex. Therefore we consider an 8.5 per cent adjustment is appropriate.

We are not satisfied that it is appropriate to provide an adjustment for differences in the capitalisation of pole top structure maintenance in this case. This is because in the forecast period ActewAGL is no longer treating urban pole top structure replacement primarily as a maintenance task.⁶⁰⁰ As discussed above, providing an OEF adjustment for something has the effect of including it in our forecast of base opex. As ActewAGL no longer expenses pole top replacement, providing it with an OEF an adjustment for pole top replacement would have the effect of providing an allowance for pole top replacement in opex and capex.

Communication networks

We are not satisfied that an OEF for the availability of commercially available communication networks would meet our materiality or duplication OEF adjustment criteria. To the extent that service providers in low customer density areas may have to use alternative solutions where there is no mobile telephone coverage, this will be

⁵⁹⁹ ActewAGL, Response to information request AER065, 31 March 2015, p. 2.

⁶⁰⁰ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, p. 78.

correlated with customer density. Also, three of the five comparison firms also face similar challenges in providing network services.

In support of Essential Energy's revised proposal, Essential Energy's COO, Mr. Humphreys, submitted that Essential Energy is unique in terms of the need to provide a two way radio network across 95 per cent of NSW.⁶⁰¹ Mr Humphreys also submitted that there is no commercial service available that provides state wide coverage with required reliability at an economic cost.

The need for two way communication in areas where there are limited commercial alternatives will be correlated with customer density. This is because the fewer customers there are in a service area, the less likely it is to be covered by a commercial communications network. As Economic Insights' SFA model accounts for customer density, as discussed above, we are not satisfied that it does not appropriately account for the availability of commercial communications networks.

Also an adjustment for differences in communication networks is not likely to meet the materiality OEF adjustment criterion. The necessity to provide an extensive two way communication system between control room and field staff, where there are limited commercial options, is not unique to Essential Energy. Other rural service providers, including the comparison firms AusNet Services, Powercor, and SA Power Networks face similar challenges providing a reliable communication system. There are areas in all three of those service providers' network areas that do not have mobile telephone coverage.⁶⁰²

Contaminated land management

We are not satisfied that an OEF adjustment for contaminated land management would meet the exogeneity or materiality OEF criteria. To the extent that electricity distribution assets have the potential to contaminate land, all service providers must manage this risk. The cost consequences of not managing this risk prudently in the past should not be visited on consumers.

We are not satisfied that an OEF adjustment for contaminated land management would meet the materiality OEF adjustment criterion. All NEM service providers have obligations to prevent land contamination due to the operations of their networks.⁶⁰³ Where environmental regulations were not as stringent in the past due to a lack of knowledge industry wide, this is a problem that would have affected all service providers. Therefore if this were the case, all service providers would face similar problems with contaminated land.

⁶⁰¹ Gary Humphreys, Statement of Gary Humphries Chief Operating Officer Essential Energy, 19 January 2015, pp. 12 to 13.

⁶⁰² Telstra, Our Coverage, available at: <https://www.telstra.com.au/mobile-phones/coverage-networks/our-coverage> [last accessed: 10 April 2015].

⁶⁰³ For example, part seven of the *Environmental Protection Act 1970* sets out the responsibilities of the Victorian service providers with regard to land contamination.

In addition, we consider that an OEF adjustment for contaminated land management would not satisfy the exogeneity OEF criterion. A prudent service provider would take appropriate action to minimise the risk of land contamination associated with its activities.

In some circumstances land contamination regulations are different across jurisdictions. In this case a prudent service provider operating under the less stringent regulations would have a duty of care to appropriately manage its environmental risk being mindful of obligations in other jurisdictions. If a service provider did not undertake sufficient risk mitigation, where best industry practice is to manage that risk, this is a reflection of the quality of that service provider's management. The costs of such mismanagement should not be visited on consumers.

In the case that a service provider acquired assets with land contamination from another service provider, in a competitive market, the cost of that remediation will be factored into the price of the acquisition. That is the firm responsible for the contamination will have paid for the future remediation costs by receiving a lower payment for the contaminated assets. As a result end users would not need to pay for contaminated land remediation.

Outsourcing

We are not satisfied that it is necessary to provide an OEF adjustment for differences in outsourcing practices between ActewAGL and the comparison firms. This is because it does not meet the exogeneity OEF adjustment criterion. Service providers choose to what extent they outsource.

In response to our draft decision, ActewAGL's consultant Advisian raised ActewAGL's ability to outsource as an OEF that might lead to material differences in cost between ActewAGL and the comparison firms.⁶⁰⁴ Advisian noted that the small size of the ACT and the small number of network service providers in its area prevents ActewAGL from utilising contractors in a similar manner to the comparison firms. Advisian considered that the smaller amount of available work prevents contractors from achieving efficiencies that are available in denser areas serviced by a greater number of service providers.

We consider that there is sufficient scale and density in the ACT to support a mature and efficient contracting market. This is because Powercor and AusNet services have both been able to outsource activities at their rural depots using Local Service Area agreements. We note that rural parts of Powercor and AusNet's network are of lower customer density than ActewAGL's network. Also, Advisian noted that Essential and TransGrid both provide services near ActewAGL's distribution network. In the rural areas of Victoria there are only two network service providers that contractors could service: the Powercor and AusNet services.

⁶⁰⁴ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 95-98.

Advisian also notes that ActewAGL must retain sufficient in house capacity to act as an informed purchaser when interacting with contractors.⁶⁰⁵ We are not satisfied that this would limit ActewAGL's ability to assess contractors' bids. Further, even if ActewAGL were to outsource all of its network operations, it could utilise the expertise of Jemena, which owns 50 per cent of ActewAGL to assess tenders.⁶⁰⁶

Reliability outcomes

We are not satisfied that an OEF adjustment for reliability outcomes would meet the duplication and exogeneity OEF adjustment criteria. Reliability is appropriately captured by Economic Insights' Cobb Douglas SFA model. Further, reliability outcomes are to some extent within management control.

In response to our draft decision the service providers and their consultants submitted that the benchmarking we used to estimate base year opex did not incorporate reliability.⁶⁰⁷ PEG and Advisian also had some detailed comments regarding the incorporation of reliability into our benchmarking.⁶⁰⁸ We address these concerns below. In this section we also outline why we consider our estimate of base opex is sufficient for ActewAGL to meet its minimum reliability standards.

Consideration of reliability in setting our base year opex

In our draft decision we considered the reliability of ActewAGL by incorporating it as an output in our opex MPFP benchmarking. The consistency between our opex MPFP benchmarking and our Cobb Douglas SFA model indicated that the Cobb Douglas SFA efficiency scores reasonably reflected the efficient, prudent opex costs of meeting the relevant reliability obligations for ActewAGL.

Economic Insights' MTFP and opex MPFP benchmarking indicated that ActewAGL could provide its current level of reliability at much lower cost. The MTFP and opex MPFP benchmarking included the number of customer minutes off supply as a negative output. Hence, poor reliability would be reflected in poor MTFP and opex MPFP performance.

Figure A.15 shows Economic Insights' opex MPFP, SFA and LSE scores for each of the service providers. This figure indicates that, measured under all our different economic benchmarking techniques, ActewAGL can provide its services at lower cost.

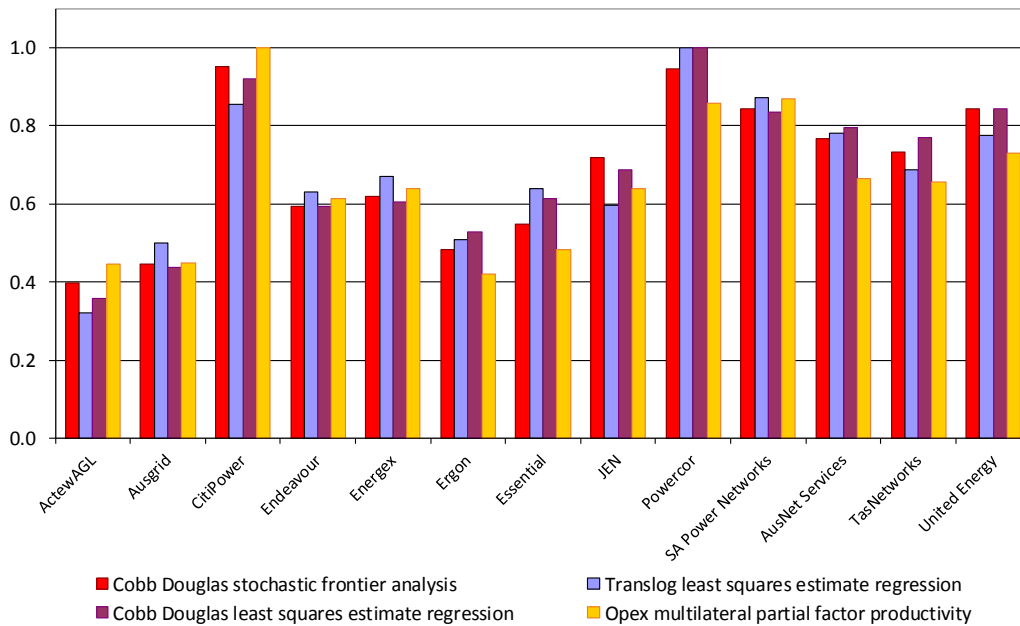
⁶⁰⁵ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, p. 97.

⁶⁰⁶ Jemena, ActewAGL Distribution Partnership, Available at: <http://jemena.com.au/what-we-do/assets/ActewAGL/> [last accessed 5 March 2015].

⁶⁰⁷ ActewAGL, RRP, 2015, p. 163. Advisian, 2015, p. 59. Essential, RRP, 2015, pp. 42–44. ActewAGL, Revised regulatory proposal, 2015, pp. 61-79. (ActewAGL, RRP, 2015). AECOM, Impact of AER Draft Determination on Service and Safety, 2015, p. 20. CEPA Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, p. 32. AusGrid, Statement of Chief Operating Officer of Ausgrid (CONFIDENTIAL), January 2015. Jacobs, Regulatory Revenue Decision, Reliability Impact Assessment, 2015, p. 12.

⁶⁰⁸ Advisian, Review of AER benchmarking, 2015, p. 59. PEGR, 2015, p. 51.

Figure A.15 Distributor average opex efficiency scores, 2006-13

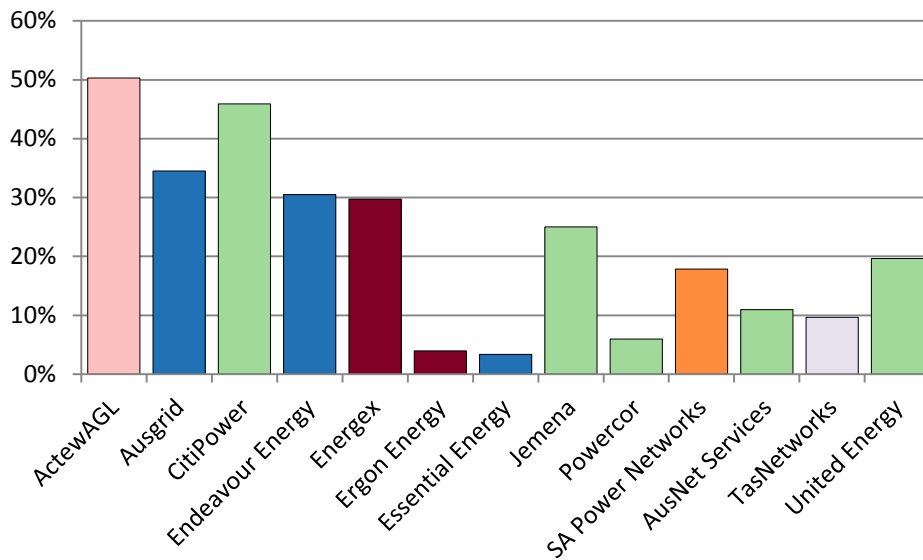


Importantly, the opex MPFP scores are closely aligned with the efficiency scores of our Cobb Douglas SFA model. This is demonstrated by the two sets of efficiency scores being highly correlated with a correlation coefficient of 0.95. This means that to the extent that reliability performance is different across service providers, its impact on opex efficiency is not significant. Therefore, we consider the Cobb Douglas SFA model reasonably reflects the efficient and prudent costs of providing standard control services, taking into account reliability performance.

We note that ActewAGL performs slightly better under the Cobb Douglas SFA compared to the opex MPFP. However, ActewAGL has a higher proportion of underground lines than other service providers.

Figure A.16 presents the underground proportion of circuits for all service providers.

Figure A.16 Underground proportion of service provider's circuits



Having less overhead lines as a proportion of total lines means that ActewAGL's assets are less exposed, hence ActewAGL should experience fewer interruptions per customer. Given this, we would expect ActewAGL would perform better under a benchmarking assessment that incorporates reliability.⁶⁰⁹

The Cobb Douglas SFA model has a variable to account for the proportion of undergrounding. This variable in the Cobb Douglas SFA model indicates that opex will decrease as the proportion of underground cables increases.⁶¹⁰ This relationship is to be expected given that underground cables are less prone to damage by climatic events.⁶¹¹ In contrast, the opex MPFP model results have not been normalised to account for the proportion of underground circuits. ActewAGL is at an advantage under the Opex MPFP benchmarking measure as its high proportion of underground circuits should lead to it incurring lower opex. Therefore the cost advantage of the higher level of underground circuits for ActewAGL is not reflected in the opex MPFP model results, while the higher reliability from this is reflected in the results. Given these factors we do not consider an OEF adjustment for reliability is required.

Detailed criticisms

In response to our draft determination the consultants of the NSW and ACT service providers, Advisian and PEG raised some detailed concerns regarding the incorporation of reliability into our benchmarking analysis. We address these concerns below.

⁶⁰⁹ ActewAGL has 50 per cent of its circuits underground. CitiPower, has the next highest proportion with 46 per cent of its circuits underground. The average underground proportion for Australian service providers is 22 per cent. Source: EBT RIN consolidated master sheet.

⁶¹⁰ Economic Insights, 2014, pp. 33–34.

⁶¹¹ Economic Insights, 2014, pp. 33–34.

Advisian

On the issue of reliability, Advisian submitted:

- 1) "The "ceteris paribus" assumption of constant reliability implicit in the benchmark model does not hold, and some adjustment is necessary to reflect changes in reliability, an issue not dealt with at all in the preferred SFA model.
- 2) Economic Insights' reliance on analysis period averages for its benchmarking models means that the effect of declining reliability performance on opex over the analysis period is not captured in its models (which by implication assumes that opex is driven by absolute SAIDI). In practice the relationship between opex and reliability is driven by a combination of the absolute level that has historically been achieved, the specific network environment and the change in SAIDI over the analysis period.
- 3) The trade-off between SAIFI and CAIDI to achieve a SAIDI target highlights that reliability can be achieved by a combination of Opex and Capex programs. No attempt has been made in the AER's benchmarking to "normalise" the approaches taken by DNSPs in this regard. This gives rise to the potential for what otherwise may be a sensible and efficient Opex / Capex trade off being judged as an Opex efficiency / inefficiency."⁶¹²

We address these points below.

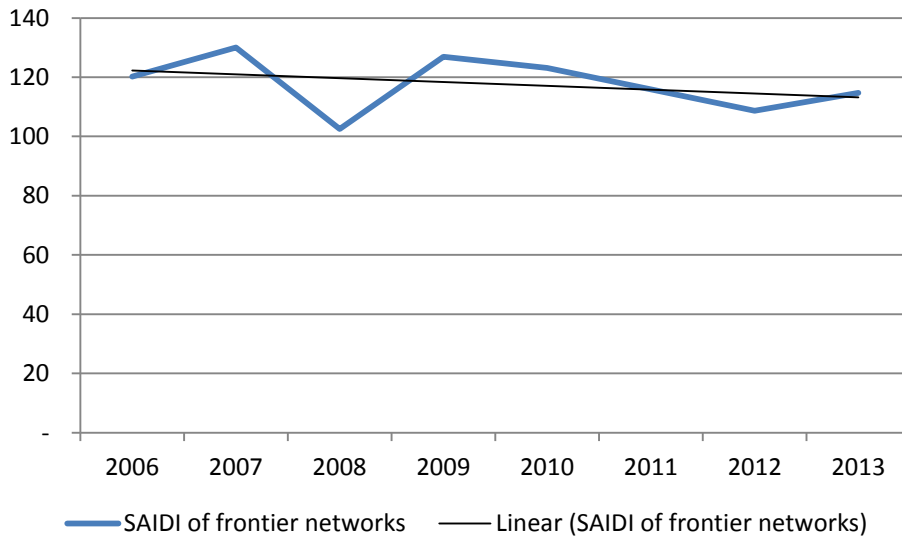
Advisian submitted that the frontier networks have exhibited decreasing reliability performance. It considered that the assumption of constant reliability in the AER's modelling does not hold and that the AER's benchmarking should be adjusted to reflect this.

We do not consider that the frontier networks have exhibited decreasing reliability performance. On both SAIDI and SAIFI measures, the performance of the frontier networks has improved. Figure A.17 shows the weighted average SAIDI of the frontier networks over the benchmarking period.⁶¹³ This shows that the SAIDI of the frontier networks has improved over the benchmarking period.

⁶¹² Advisian, Review of AER benchmarking, 2015, p. 59.

⁶¹³ The weighted average has been calculated based upon customer numbers in accordance with our approach to calculating the benchmarking frontier. Advisian also indicates that it calculates a weighted average however does not outline how it did so. Advisian argues that under its weighted average the performance of the networks has deteriorated. This is contrary to our analysis.

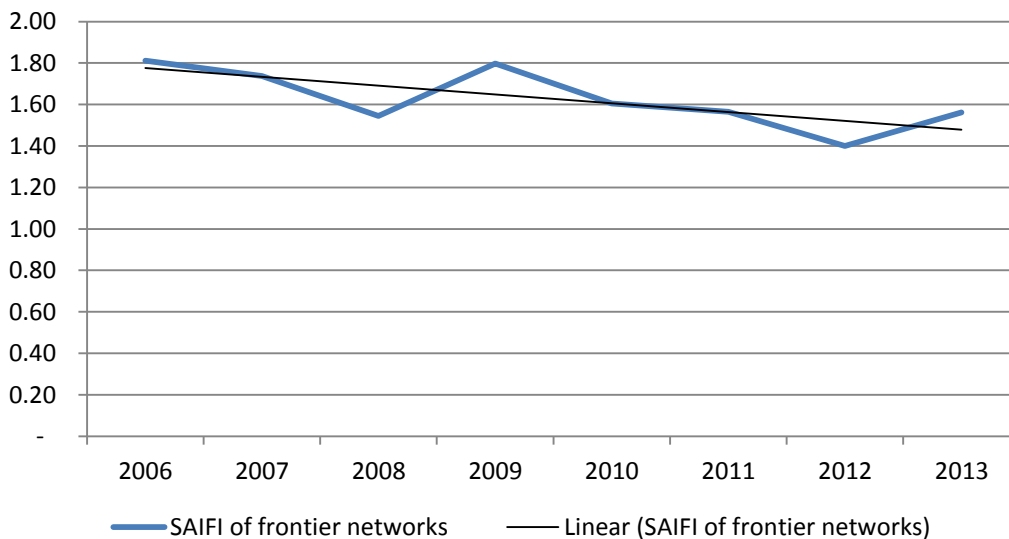
Figure A.17 SAIDI of frontier networks against long term average



Note: SAIDI is calculated excluding excluded outages and MED days consistent with Advisian's approach.

Figure A.18 presents the SAIFI performance of the frontier networks. Again under this analysis SAIFI of the frontier networks has improved over the benchmarking period. Figure A.17 and Figure A.18 show that SAIFI has been improving at a faster rate than SAIDI for the frontier networks. This means that CAIDI of the frontier networks will appear to deteriorate over time.

Figure A.18 SAIFI of frontier networks against long term average



Note: SAIDI is calculated excluding excluded outages and MED days consistent with Advisian's approach.

Advisian stated that CAIDI for the frontier networks has declined across the benchmarking period. We agree that this is the case, but consider that this is not a

concern. CAIDI represents the average time required to restore service.⁶¹⁴ CAIDI is not a measure of the detriment of outages to consumers. The IEEE calculate SAIDI in the following manner:⁶¹⁵

$$CAIDI = \frac{SAIDI}{SAIFI}$$

Under this calculation CAIDI will deteriorate if SAIFI improves at a faster rate than SAIDI. This is the case for the frontier networks. However, under this scenario customers experience fewer interruptions and fewer minutes off supply and are hence better off.

Advisian submitted that Economic Insights' reliance on analysis period averages for its benchmarking models means that the effect of declining reliability performance on opex over the analysis period is not captured in its modelling.⁶¹⁶ As noted above, this statement appears to be incorrect as reliability performance for the frontier networks as measured by SAIDI and SAIFI has improved over the period according to our measures.

Advisian also submitted that that the trade-off between SAIFI and CAIDI to achieve a SAIDI target highlights that reliability can be achieved by a combination of Opex and Capex programs.⁶¹⁷ Advisian submitted that no attempt has been made in the AER's benchmarking to "normalise" the approaches taken by distributors in this regard.

We note that the frontier networks have significantly increased their opex on maintenance and vegetation management.⁶¹⁸ This additional opex should reduce outages caused by vegetation and asset failure. However increasing opex will disadvantage the frontier networks under our benchmarking of opex. This is because, as Advisian states, these networks could have instead undertaken capital programs to reduce outages. Therefore, we do not consider that normalisation of the results to account for the trade-off between SAIFI and CAIDI is necessary.

As discussed in our consideration of OEF adjustments for capitalisation, we note that ActewAGL has had a higher ratio of opex to totex than the other service providers during the benchmarking period. However, going forward ActewAGL has proposed to change its capitalisation approach. We have taken this proposed change into account when considering ActewAGL's relative efficiency in applying the benchmarking results. This change will bring ActewAGL in line with the frontier service providers in the forecast period.

Pacific Economic Group Research

PEGR questioned the way in which reliability was included in the scale index:

⁶¹⁴ IEEE Power Engineering Society, IEEE Guide for Electric Power Distribution Reliability Indices, 2004, p. 5.

⁶¹⁵ IEEE Power Engineering Society, IEEE Guide for Electric Power Distribution Reliability Indices, 2004, p. 5.

⁶¹⁶ Advisian. 2015, p. 59.

⁶¹⁷ Advisian. 2015, p. 59.

⁶¹⁸ From 2008–9 to 2012–13 the frontier networks increased their expenditure on vegetation management and maintenance by 171 per cent and 77 per cent respectively (in nominal terms).

The impact of reliability on opex is a complicated empirical issue. Good reliability may require higher opex, but it also depends on weather, forestation, system undergrounding, AMI, and system reinforcements. EI's approach to reliability unfairly favours urban utilities in Victoria and ACT since these utilities enjoy favourable reliability operating conditions.⁶¹⁹

In response to this comment Economic Insights notes that PEGR does not provide an explanation how the Victorian and ACT service providers differ from the NSW urban service providers which face broadly similar 'reliability operating conditions'. Rather, Economic Insights notes that it is likely that the Victorian and ACT distributors have focussed more on improving their reliability.⁶²⁰

Management control of reliability

We consider that there are a number of actions that management can undertake in order to control the level of reliability within their networks. This includes spending more on vegetation management and maintenance. Advisian also notes actions that management can take to manage reliability.⁶²¹ Though outages are often caused by exogenous circumstances, reliability outcomes are not fully exogenous to management control.

Further, in our benchmarking we apply the Institute of Electrical and Electronics Engineers standard to exclude the effects of major events that are caused by to extreme weather or other events. Consequently reliability outcomes that we have included in our benchmarking reflect business as usual circumstances. Thus the reliability in our benchmarking relates to events that are within management control.

Meeting reliability standards

Under the NER we must set opex at the level consistent with the operating expenditure criteria. This includes the prudent, efficient opex to meet reliability standards.⁶²²

We consider that our estimate of base opex reasonably reflects the efficient and prudent costs for meeting reliability standards. Based on our benchmarking analysis, as outlined above, we consider that that ActewAGL can deliver its current levels of reliability at lower cost. Our base year opex is sufficient for ActewAGL to maintain its reliability at its current level as our forecast of base year opex is based upon ActewAGL's reliability over the benchmarking period.

ActewAGL's minimum reliability standard differs from other minimum reliability standards for NEM service providers in that it applies to all outages including both planned and unplanned outages. Figure A.19 presents ActewAGL's SAIFI performance against its standard. This shows that ActewAGL has been meeting the standard easily over the 2006–13 period.

⁶¹⁹ PEGR, 2015, p. 51.

⁶²⁰ Economic Insights, 2015, pp. 5-6.

⁶²¹ Advisian, Review of AER benchmarking, 2015, p. 59.

⁶²² NER cl. 6.5.6 (a) and (c).

Figure A.19 ActewAGL's SAIFI performance against their standard

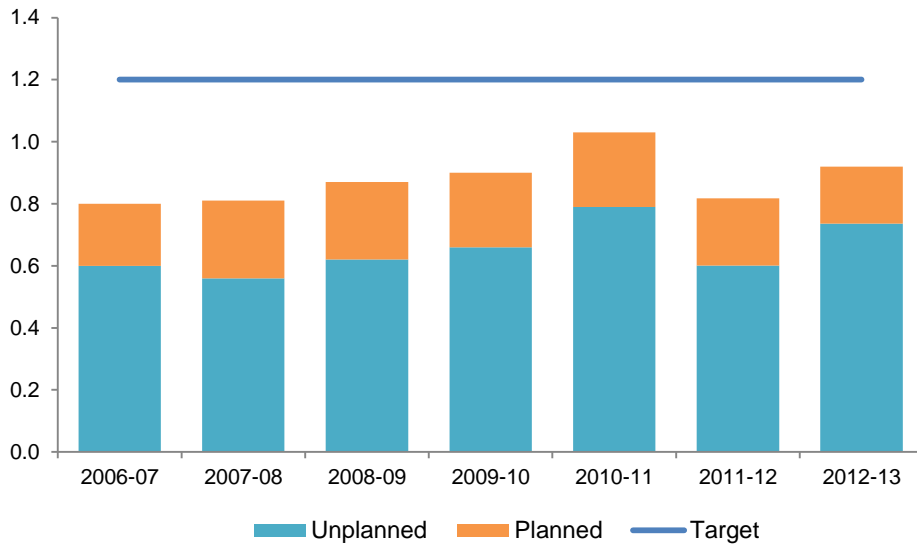
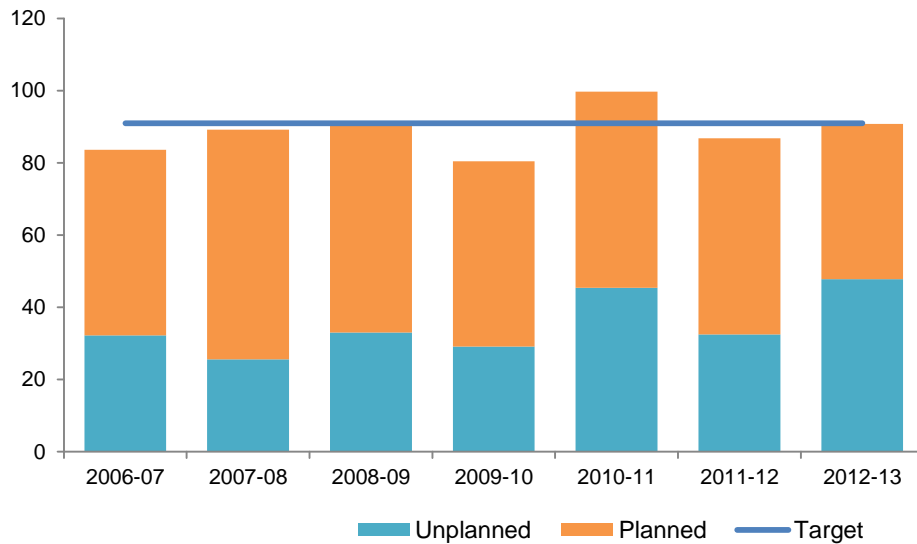


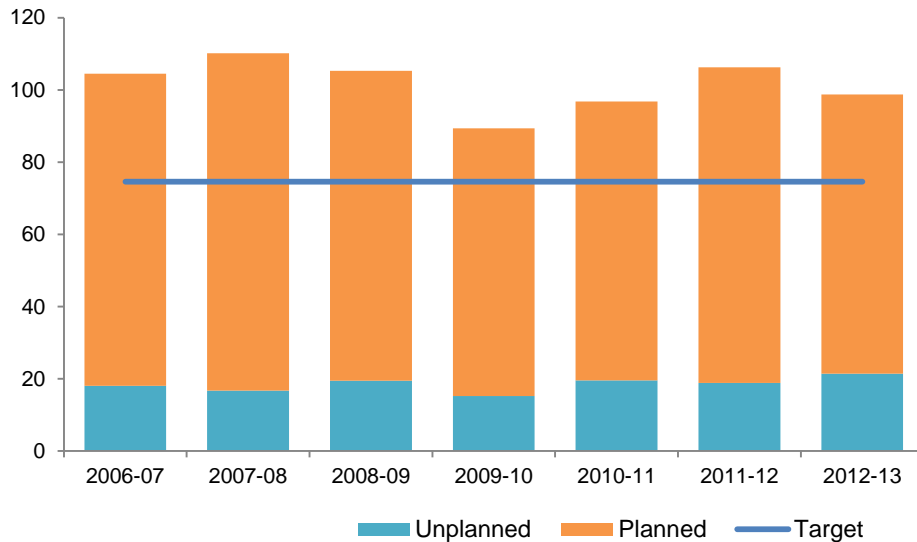
Figure A.20 shows that ActewAGL has not regularly met its SAIDI performance standard over the benchmarking period. In some instances it has had slightly worse reliability than the standard. However, this appears to be a result of their planned outages. ActewAGL could meet the standard if it reduced the duration of its planned outages.

Figure A.20 ActewAGL's SAIDI performance against their standard



ActewAGL is also unique in the NEM because it has a CAIDI standard. Figure A.21 shows ActewAGL has not met this CAIDI standard over the benchmarking period. However, as illustrated in the diagram below, this is because the planned component of their CAIDI is so high. As CAIDI is the ratio of SAIDI to SAIFI, ActewAGL could meet this standard by increasing the frequency of its planned outages.

Figure A.21 ActewAGL's CAIDI performance against their standard



Safety outcomes

We are not satisfied that an OEF adjustment for service providers' safety outcomes would meet the duplication OEF adjustment criterion. Safety outcomes are implicitly accounted for in the SFA benchmarking model as the comparison firms all operate safe networks.

In response to our 2014 draft decision the NSW service providers stated that:

It is ... our view that the AER draft decision does not provide sufficient revenues to maintain the safety of the system consistent with achievement of the NEO.^{623 624 625}

In response to our statement, that peers in other states are able to provide safe reliable services at lower overall levels of opex, they submitted:

"We disagree with this statement and draw the attention of the AER to recent critical electrical network failure events in other states which have had, or had the potential to, impact the lives and wellbeing of the public."^{626 627 628}

The critical network failures to which they refer are bushfires in Victoria and Western Australia.^{629 630 631}

⁶²³ Ausgrid, Revised Proposal, 20 January 2015, p 29.

⁶²⁴ Essential, Revised Proposal, 20 January 2015, p 36.

⁶²⁵ Endeavour, Revised Proposal, 20 January 2015, p 32.

⁶²⁶ Ausgrid, Revised Proposal, 20 January 2015, p 29.

⁶²⁷ Essential, Revised Proposal, 20 January 2015, p 36.

⁶²⁸ Endeavour, Revised Proposal, 20 January 2015, pp 33.

⁶²⁹ Ausgrid, Revised Proposal, 20 January 2015, p 29.

⁶³⁰ Essential, Revised Proposal, 20 January 2015, p 37.

⁶³¹ Endeavour, Revised Proposal, 20 January 2015, p 33.

They also quote the Victorian Bushfires Royal Commission (VBRC) which stated:

"Distribution businesses' capacity to respond to an ageing network is, however, constrained by the electricity industry's economic regulatory regime."^{632 633 634}

The NSW service providers list their safety obligations and describe how their asset management systems allow them to discharge their regulatory obligations at lowest cost.^{635 636 637} They consider that if they were to operate at a lower cost it would lead to an increase in safety risks for their workers and members of the public. They commissioned R2A and Jacobs to analyse the effects of the decrease in opex on safety outcomes. R2A⁶³⁸ and Jacobs⁶³⁹ found that the number of safety incidents would increase. The NSW service providers also noted backlogs in maintenance tasks and increases in asset fires identified by Energy Safe Victoria (ESV). Ausgrid, Endeavour, and Essential also submitted statements from their Chief Operating Officers (COOs) that presented their opinions on the safety and reliability outcomes of our draft decision on opex.^{640 641 642}

ActewAGL made similar statements to the NSW service providers.⁶⁴³ ActewAGL submitted that it would be required to make large reductions to operating activities in order to avoid financial losses.⁶⁴⁴ ActewAGL considers that these changes to its operating practices would adversely affect safety and reliability outcomes.⁶⁴⁵ ActewAGL provided a report by AECOM which was based on a similar premise to the R2A report commissioned by the NSW service providers, in support of its position.⁶⁴⁶ ActewAGL also submitted a statement from its General Manager of Asset Management, presenting his opinion on the outcomes of our draft decision on safety and reliability.⁶⁴⁷

We are not satisfied that an OEF adjustment for safety outcomes would meet the duplication OEF adjustment criterion. All of Economic Insights' models implicitly account for safety. This is because the comparison firms operate safe networks.

⁶³² Ausgrid, Revised Proposal, 20 January 2015, p 29.

⁶³³ Essential, Revised Proposal, 20 January 2015, p 37.

⁶³⁴ Endeavour, Revised Proposal, 20 January 2015, p 33.

⁶³⁵ Ausgrid, Revised Proposal, 20 January 2015, pp 29-32.

⁶³⁶ Essential, Revised Proposal, 20 January 2015, pp 37-39.

⁶³⁷ Endeavour, Revised Proposal, 20 January 2015, pp 33-36.

⁶³⁸ R2A, Asset / System Failure Safety Risk Assessment: Client Reference Networks NSW RFQE2, January 2015

⁶³⁹ Jacobs, Networks NSW - Draft Determination Review: System Capex & Maintenance Prudency Assessment, 15 January 2015.

⁶⁴⁰ Trevor Armstrong, Statement of Trevor Armstrong Chief Operating Officer Ausgrid, 19 January 2015, pp. 32 - 36.

⁶⁴¹ Rod Howard, Statement of Rod Howard Chief Operating Officer Endeavour Energy, 19 January 2015, pp.29-30.

⁶⁴² Gary Humphreys, Statement of Gary Humphries Chief Operating Officer Essential Energy, 19 January 2015, pp. 22 to 28.

⁶⁴³ ActewAGL, Revised Proposal, 20 January 2015, pp. 67-69.

⁶⁴⁴ ActewAGL, Revised Proposal, 20 January 2015, pp. 67-68.

⁶⁴⁵ ActewAGL, Revised Proposal, 20 January 2015, pp. 71-78.

⁶⁴⁶ AECOM, The Impact of the AER's Draft Decision on ActewAGL's Service and Safety Performance, 15 January 2015.

⁶⁴⁷ Stephen Devlin, Witness Statement, 13 February 2015.

The Victorian service providers operate safe networks. The Victorian service providers are required under Part 10 of the *Electricity Safety Act 1998* to submit Electricity Safety Management Schemes to ESV. In addition to this they are also required to submit Bushfire Mitigation Plans and Electric Line Clearance Management Plans.⁶⁴⁸ The NSW service providers have claimed that the effect of the Black Saturday bushfires is evidence that the Victorian service providers do not operate safe networks. However, prior to the Black Saturday bushfires ESV found AusNet Services and Powercor, the two service providers subject of class actions after Black Saturday, were “generally compliant” with their regulatory obligations.⁶⁴⁹ We also note that the fact that Endeavour Energy is currently facing a class action relating to the 2013 Blue Mountains bushfires does not necessarily mean that Endeavour Energy operates an unsafe network.

The comments by VBRC raised by the NSW service providers relate to asset replacement rather than opex. We determine forecasts for total capital and operating expenditure; not asset replacement programs. Nonetheless our capex forecast, which is determined in part by our repex model, takes into account the specific circumstances of service providers, including the rate at which their assets fail. We also note that the VBRC made its comment prior to our last determination for the Victorian service providers. In the AER's following determination the AER acknowledged that:

“there have been changes to the safety regime that applies to the Victorian DNSPs. ... This has led to a reassessment of replacement expenditure for a number of the DNSPs, which the AER has undertaken in consultation with Energy Safe Victoria (ESV), and a substantial increase in the allowance.”⁶⁵⁰

The NSW service providers, and R2A,⁶⁵¹ have also noted that ESV has stated that there has been an increase in the number of asset failures over the 2011 to 2013 period. This is true, but ESV also noted that given the works done by the Victorian service providers it would have expected that the number of asset failures would decrease.⁶⁵² ESV therefore considers that the increase in failures may have been due to unfavourable weather conditions and the increasing average age of assets in Victoria.^{653 654}

ESV noted that in 2012 overall management of the Victorian Networks was good.⁶⁵⁵ ESV noted that in 2011 the performance of the Victorian Networks, with regard to asset failure, was consistent with the performance of networks elsewhere in Australia and

⁶⁴⁸ ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, p. 5.

⁶⁴⁹ VBRC, vol 2, chapter 4, pp. 159 to 164.

⁶⁵⁰ AER, Final decision: Victorian electricity distribution network service providers: Distribution determination 2011–2015, October 2010, p. iv.

⁶⁵¹ R2A, Asset / System Failure Safety Risk Assessment: Client Reference Networks NSW RFQE2, January 2015 pp. 18-19.

⁶⁵² ESV, Safety performance report on Victorian Electricity Networks 2012, June 2013, p.7.

⁶⁵³ ESV, Safety performance report on Victorian Electricity Networks 2012, June 2013, p.7.

⁶⁵⁴ ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, p. 5.

⁶⁵⁵ ESV, Safety performance report on Victorian Electricity Networks 2012, June 2013, p.7.

that in other areas they performed adequately.⁶⁵⁶ ESV found in 2010 that overall there was a good standard of inspection and timely repair by the industry although some service providers performed better than others.⁶⁵⁷ More recently, in 2014 ESV noted:

- The Victorian service providers have comprehensive Electricity Safety Management Systems, many supplemented by other management systems and certification such as PAS 55, ISO 9001, ISO 14001, AS4801 and OHSAS 18001⁶⁵⁸
- Asset maintenance in Victoria, in accordance with bushfire mitigation plans, was adequate for the 2013-2014 bushfire season, with no areas of non-compliance observed⁶⁵⁹
- In general, the Victorian service providers' Electric Line Clearance Management Plans were clear, well presented and that there was a strong connection between safety plans and activities in the field⁶⁶⁰
- Despite the extensive effort put into condition assessment and asset replacement, failure rates in Victoria had increased. While some service providers, notably United Energy, were behind schedule in their asset replacement programs all would be able to complete their five year programs by 2015⁶⁶¹
- The number of fire starts in Victoria was above the F factor set by the AER, partly due the increasing age of assets and partly due to adverse weather conditions.⁶⁶²
- All of the Victorian service providers were on schedule to meet the electric line clearance requirements as agreed upon with ESV. Although CitiPower and Powercor were granted 12 months extensions from the original timeframes.⁶⁶³
- The Victorian service providers go to considerable lengths to prevent unauthorised access and ensure that assets are secure⁶⁶⁴
- The underlying trend for serious injuries from electrical causes to the public and Victorian service providers workers was similar to previous years⁶⁶⁵
- There were some opportunities for improvement and areas requiring attention in the Victorian service provider's work practices⁶⁶⁶

We note that ESV highlighted issues relating to fire starts, asset failures, and work practices. ESV notes that the increase in fire starts in 2013 may be due to adverse weather conditions and aging assets. The replacement rate of assets relates to replex,

⁶⁵⁶ ESV, Safety performance report on Victorian Electricity Networks 2011, August 2012, p. i.

⁶⁵⁷ ESV, Safety performance report on Victorian Electricity Networks 2010, 2011, p. i.

⁶⁵⁸ ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, p. 24.

⁶⁵⁹ ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, p. 26.

⁶⁶⁰ ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, pp. 29-30.

⁶⁶¹ ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, pp. 31-50 and 61-78.

⁶⁶² ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, pp. 61-78.

⁶⁶³ ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, pp. 50-60.

⁶⁶⁴ ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, p. 78.

⁶⁶⁵ ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, p. 82.

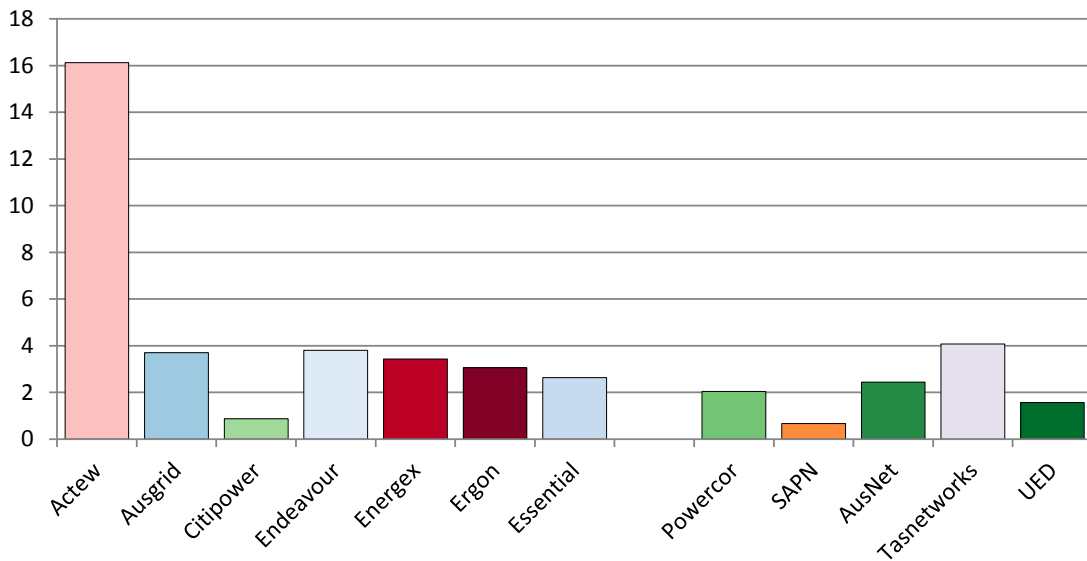
⁶⁶⁶ ESV, Safety performance report on Victorian Electricity Networks 2013, June 2014, p. 87.

not opex, as discussed above. On concerns about work practices, we note that service providers in Victoria tend to have higher levels of workplace safety than other areas of the NEM. This is discussed below.

Other measures of network safety also suggest that the comparison firms perform similarly or better than ActewAGL. These measures include LTIFR, vegetation contacts with assets, and reliability for customers on life support devices.

On Lost Time Injury Frequency Rate (LTIFR) the comparison firms generally tend to outperform the ACT, NSW, and Queensland service providers. LTIFR measures the number of injuries suffered in the workplace that lead to one or more shifts being missed for every million hours worked. The LTIFR for the NEM service providers over the 2009 to 2013 period is shown below.

Figure A.22 LTIFR for NEM service providers 2009 to 2013



Source: ActewAGL,⁶⁶⁷ Ausgrid,⁶⁶⁸ AusNet Services,⁶⁶⁹ CitiPower,⁶⁷⁰ Endeavour Energy,⁶⁷¹ Energex,⁶⁷² Ergon Energy,⁶⁷³ Essential Energy,⁶⁷⁴ Powercor,⁶⁷⁵ SAPN,⁶⁷⁶ TasNetworks,⁶⁷⁷ United Energy.⁶⁷⁸

Notes: ActewAGL changed its reporting systems in 2011 therefore its datum only covers the period July 2011 to December 2013. TasNetwork's datum does not include contractors prior to 2012. Endeavour, Essential and SAPN data do not include contractors. AusNet's Datum relates to its gas, distribution and transmission business segments. Jemena is not displayed because it claimed confidentiality over its datum.

On vegetation contacts causing fires per 1000km of overhead route line length, the comparison firms tended to have similar performance to the NSW and QLD distributors, with ActewAGL having a higher number of defects.^{679 680 681 682}

In the absence of other available data we have considered the measures available to us. One such measure relates to incidents in which businesses report (under the Retail Law Compliance procedures and guidelines) breaches, or potential breaches, of the

⁶⁶⁷ ActewAGL, Response to Information Request AER ACTEW 053, 9 February 2015.

⁶⁶⁸ Ausgrid, Response to Information Request AER AUSGRID 044, 23 January 2015.

⁶⁶⁹ AusNet Services, Response to LTIFR Information Request, 9 January 2015.

⁶⁷⁰ CitiPower, Response to Information Request on LTIFRs, 2 February 2015.

⁶⁷¹ Endeavour Energy, Response to Information Request AER Endeavour 037, 16 January 2015.

⁶⁷² Energex, Response to Information Request AER Energex, 23 January 2015.

⁶⁷³ Ergon Energy, Response to Information Request AER Ergon008, 7 January 2015.

⁶⁷⁴ Essential Energy, Response to Information Request AER Essential 033, 23 January 2015.

⁶⁷⁵ CitiPower, Response to Information Request on LTIFRs, 2 February 2015.

⁶⁷⁶ SA Power Networks, Response to Information Request AER SAPN 012, 20 January 2015.

⁶⁷⁷ TasNetworks, Response to LTIFR information request, 21 January 2015.

⁶⁷⁸ United Energy, Response to LTIFR Information Request, 27 January 2015.

⁶⁷⁹ Category Analysis RIN Responses to template 2.7 and Economic Benchmarking RIN Responses to templates 6 and 8.

⁶⁸⁰ Ausgrid, Response to Information Request Ausgrid 052, 17 February 2015.

⁶⁸¹ Endeavour, Response to Information Request Endeavour 044, 16 February 2015.

⁶⁸² Essential Energy, Response to Information Request Essential 083, 16 February 2015.

life support provisions in the Retail Law and Rules. These provisions set out the manner and timing by which businesses provide registered life support customers with notice of a planned interruption and prohibit disconnection of premises with registered life support needs. We acknowledge that this is an incomplete measure as data are only available for the ACT, NSW, SA and Tasmanian service providers and rely on reports from businesses. However, based on the information available, there is no evidence that the comparison firms perform worse on this measure.

Since the AER assumed enforcement responsibilities in South Australia it has not issued any infringement notices in relation to (alleged) breaches of the life support provisions to SA Power networks or ActewAGL. The AER assumed responsibility for retail regulation under the NECF in South Australia on 1 February 2013 and 1 July 2012 in the ACT.

The findings of the AECOM, Jacobs and R2A reports are based on the assumption that the ACT and NSW service providers will reduce their work programs in response to our draft decision.⁶⁸³⁶⁸⁴ ⁶⁸⁵ The COO statements are also based on this premise.⁶⁸⁶ ⁶⁸⁷ ⁶⁸⁸ R2A and Mr Armstrong assume no efficiencies will be found. Jacobs assume that the NSW service providers will be able to find some opex efficiencies. AECOM, Mr Devlin, Mr Howard, and Mr Humphreys do not make clear what level of efficiencies they consider ActewAGL, Endeavour and Essential could find.

Our draft decision was not made on the assumption that the ACT and NSW service providers would reduce their work programs. It was made on the basis that the comparison firms can provide a safe service for less opex than the ACT and NSW service providers. The ACT and NSW service providers have not provided sufficient evidence to show that it is not possible for them to find similar efficiencies or that the comparison firms operate unsafe networks.

The Jacobs and R2A reports also did not provide sufficient evidence to suggest that the comparison firms' opex is at a level that prevents them from providing services at an acceptable level of safety.⁶⁸⁹ ⁶⁹⁰ The AECOM report and COO statements provided

⁶⁸³ AECOM, The Impact of the AER's Draft Decision on ActewAGL's Service and Safety Performance, 15 January 2015, pp. 19 - 22.

⁶⁸⁴ Jacobs, Networks NSW - Draft Determination Review: System Capex & Maintenance Prudency Assessment, 15 January 2015, pp. 4, 47-52 and 57.

⁶⁸⁵ R2A, Asset / System Failure Safety Risk Assessment: Client Reference Networks NSW RFQE2, January 2015, pp. 14-15.

⁶⁸⁶ Trevor Armstrong, Statement of Trevor Armstrong Chief Operating Officer Ausgrid, 19 January 2015, pp. 32 - 36.

⁶⁸⁷ Rod Howard, Statement of Rod Howard Chief Operating Officer Endeavour Energy, 19 January 2015, pp.29-30.

⁶⁸⁸ Gary Humphreys, Statement of Gary Humphries Chief Operating Officer Essential Energy, 19 January 2015, pp. 22 to 28.

⁶⁸⁹ Jacobs, Networks NSW - Draft Determination Review: System Capex & Maintenance Prudency Assessment, 15 January 2015, p. 50.

⁶⁹⁰ R2A, Asset / System Failure Safety Risk Assessment: Client Reference Networks NSW RFQE2, January 2015 pp. 18-19.

no evidence that the comparison firms' opex is at a level that prevents them from providing services at an acceptable level of safety.^{691 692 693 694}

The R2A report raised the issue of recent increases in asset failure in Victoria already discussed above. R2A also submitted that the proposed changes would lead to Ausgrid's asset inspection cycles to increase to eight years from five years.⁶⁹⁵ However, the Victorian service providers, which make up the majority of the comparison firms, are required to inspect their assets every three years in Hazardous Bushfire Risk Areas and every five years in all other areas.⁶⁹⁶

Jacobs submitted that we have not robustly substantiated a position on whether the asset age profiles of the comparison firms are appropriate for benchmarking the NSW distributors.⁶⁹⁷ However, it provided no analysis of our WARL measure to support the claim and even noted that Endeavour Energy itself uses a WARL model to forecast its repex costs.⁶⁹⁸ AECOM and Jacobs also consider that we have overlooked the FMECA/RCM models used by the NSW service providers and the Riva software used by ActewAGL.^{699 700} The comparison firms also use similar condition based service optimisation models^{701 702 703 704} but provide services at a lower cost.

Jacobs has also stated that it considers we have not adequately substantiated a position on the proportion of expenditure reductions which are expected to be absorbed through an increase in risk profile.⁷⁰⁵ We expect all opex reductions to be made through finding opex efficiencies with no negative impact on safety outcomes. Where service providers are unable to provide a prudent level of safety with the level of opex that reflects the opex criteria, we would expect their shareholders to bear the cost.

⁶⁹¹ AECOM, The Impact of the AER's Draft Decision on ActewAGL's Service and Safety Performance, 15 January 2015.

⁶⁹² Trevor Armstrong, Statement of Trevor Armstrong Chief Operating Officer Ausgrid, 19 January 2015, pp. 32 - 36.

⁶⁹³ Rod Howard, Statement of Rod Howard Chief Operating Officer Endeavour Energy, 19 January 2015, pp.29-30.

⁶⁹⁴ Gary Humphreys, Statement of Gary Humphries Chief Operating Officer Essential Energy, 19 January 2015, pp. 22 to 28.

⁶⁹⁵ R2A, Asset / System Failure Safety Risk Assessment: Client Reference Networks NSW RFQE2, January 2015 pp. 14-15.

⁶⁹⁶ Electricity Safety (Bushfire Mitigation) Regulations 2013, s. 7.(i).

⁶⁹⁷ Jacobs, Networks NSW - Draft Determination Review: System Capex & Maintenance Prudency Assessment, 15 January 2015, p. 50.

⁶⁹⁸ Jacobs, Networks NSW - Draft Determination Review: System Capex & Maintenance Prudency Assessment, 15 January 2015, Appendix B.

⁶⁹⁹ Jacobs, Networks NSW - Draft Determination Review: System Capex & Maintenance Prudency Assessment, 15 January 2015, p. 4.

⁷⁰⁰ AECOM, The Impact of the AER's Draft Decision on ActewAGL's Service and Safety Performance, 15 January 2015, pp. 3 - 6.

⁷⁰¹ Powercor, Bushfire Management Plan 2014–19, 10 July 2014, p. 15.

⁷⁰² CitiPower, Bushfire Management Plan, 1 July 2014, p. 17.

⁷⁰³ SA Power Networks, Regulatory Proposal: Attachment 7.2, 2014, p. 64.

⁷⁰⁴ AusNet services, Bushfire Management Plan: Electricity Distribution Network, 22 July 2014, p. 37.

⁷⁰⁵ Jacobs, Networks NSW - Draft Determination Review: System Capex & Maintenance Prudency Assessment, 15 January 2015, p. 50.

The COO and general manager statements do not offer evidence to suggest that the comparison firms' opex is at a level that prevents them from providing services at an acceptable level of safety.

Based on the above evidence, we consider that the comparison firms operate safe networks at lower levels of opex such that no OEF adjustment is necessary to account for safety.

Unregulated Services

We are not satisfied that an OEF adjustment for differences in the unregulated services that service providers engage in would meet the exogeneity OEF adjustment criterion. The extent to which a service provider engages in unregulated activities is under management's control.

In response to our draft decision, ActewAGL's consultant Advisian submitted that ActewAGL will have a cost disadvantage relative to the comparison firms because of differences in the provision of unregulated activities.⁷⁰⁶ Advisian submitted that the volume or appetite for pursuing unregulated revenue is fundamentally an internal matter for service providers', and therefore an OEF adjustment for the scale of unregulated activities is inappropriate.⁷⁰⁷ However, Advisian submitted that ActewAGL is prevented from providing unregulated services because of its geographically isolated position.

We are not satisfied that ActewAGL is unable to provide unregulated services. Evidence of this is that previously ACTEW Corporation owned Ecowise Environmental and TransACT. Ecowise Environmental provides a range of environmental solutions including analytical services, monitoring and technical services, and consulting. ACTEW Corporation decided to sell Ecowise Environmental in 2009.⁷⁰⁸ ACTEW Corporation decided to sell Ecowise in light of Jemena's desire to sell its share and focus on core business interests. ACTEW Corporation also owned part of TransACT, a telecommunications network service provider.⁷⁰⁹ From the period 2004 to 2011, ActewAGL provided finance, administration, marketing, customer service, sales, billing networks and business systems to TransACT.⁷¹⁰⁷¹¹ This demonstrates that there are opportunities for ActewAGL to participate in unregulated activities in the ACT. Additionally ActewAGL does provide unregulated activities. For example, they install solar panels, hot water services, and air conditioners.⁷¹²

⁷⁰⁶ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, p. 98.

⁷⁰⁷ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, p. 86.

⁷⁰⁸ ACTEW Corporation, ACTEW sells Ecowise Environmental, available at: <http://www.actew.com.au/Media-Centre/Media-Releases/2009/November/12/ACTEW%20sells%20Ecowise%20Environmental.aspx> [last accessed 13 March 2015].

⁷⁰⁹ ACTEW Corporation, Annual Report 2007, p. 19.

⁷¹⁰ ACTEW Corporation, Annual Report 2007, p. 19.

⁷¹¹ ActewAGL, Annual Report 2010-11, p. 33.

⁷¹² ActewAGL, Products and services, available at: <http://www.actewagl.com.au/Product-and-services.aspx>, [last accessed 15 March 2015].

A.6.7 Geographic factors

Bushfire risk

We are not satisfied that an OEF adjustment for differences in bushfire risk between ActewAGL and the comparison firms would meet the materiality OEF adjustment criterion. Differences in bushfire risk between ActewAGL and the comparison firms will not lead to material differences in opex.

In our draft decision, we did not include an adjustment for bushfire risk, but included it in our adjustment for immaterial OEFs. ActewAGL faces a similar level of bushfire risk as the comparison firms, and has regulations that are more stringent in some circumstances and less so in others. Therefore we considered that it would face similar costs for bushfire mitigation as the comparison firms.

ActewAGL did not make submissions on our conclusion for this OEF in its revised proposal.

However, in accordance with our treatment of immaterial OEFs we have provided a positive 0.5 per cent adjustment for differences in bushfire risk. Although an OEF adjustment for differences in bushfire risk is not likely to lead to material differences in opex, the differences it does cause would meet the exogeneity and duplication OEF criteria. The geographic characteristics and settlement patterns of a network area are beyond the control of service providers. Economic Insights' SFA model does not account for differences in bushfire risk. We have provided a positive 0.5 per cent adjustment because it is unclear if differences in bushfire risk will lead to a cost advantage or disadvantage for ActewAGL relative to the comparison firms.

Corrosive elements

We are not satisfied that an OEF adjustment for corrosive environments would meet the materiality OEF adjustment criterion. All service providers have assets that corrosive elements affect.

In our draft decision we did not provide an OEF adjustment for corrosive elements. This was on the basis that all service providers are affected by corrosive elements. While salts affect assets in coastal areas, dusts affect assets in inland areas. While all service providers will be affected to some extent, the differences in the corrosive elements in each area will lead to differences in design and operational considerations that may affect opex. However, sufficient evidence was not provided to show that these differences would be material.

In response to our draft decision, we received no evidence that ActewAGL has greater or lesser exposure to corrosive elements than the comparison firms.

However, in accordance with our treatment of immaterial OEFs we have provided a positive 0.5 per cent adjustment for differences in exposure to corrosive elements. Although an OEF adjustment for differences in exposure to corrosive elements is not likely to lead to material differences in opex, the differences they do cause would meet

the exogeneity and duplication OEF criteria. The prevalence of corrosive compounds in a network area is beyond service providers' control and Economic Insights' SFA model does not have a variable to account for it. We have provided a positive 0.5 per cent adjustment because it is unclear if differences in exposure to corrosive elements will lead to a cost advantage or disadvantage for ActewAGL relative to the comparison firms.

Environmental Variability

We are not satisfied that an OEF adjustment for environmental variability would meet the materiality OEF adjustment criterion. Intra-network environmental variability will not lead to material differences in opex.

In its regulatory proposal Ergon Energy raised intra-network environmental variability as an issue that would lead to material differences in opex between it and the comparison firms.⁷¹³ Ergon Energy submitted metrics on the variability of temperature, rainfall, and humidity to support this claim. These metrics showed that Ergon has the highest level of intra-network variability in humidity, rainfall, and temperature. Ergon considers this variability of environment within its network presents Ergon Energy with a significant challenge in the development of optimal maintenance schedules and resource allocation. Ergon did not quantify the effect of these scheduling and logistic issues on its opex. Further, Ergon Energy did not adequately explain the link between environmental variability and increased maintenance scheduling costs or resource allocation costs.

We are not satisfied that differences in environmental variability will lead to material differences in opex. All service providers must deal with heterogeneity in managing their assets. The major driver of this heterogeneity is technological change. As the technology of electricity distribution advances over time, service providers install different types of assets. However, the older assets, based on a different technology remain. Managing this complexity is one of the core competencies of an asset manager. Ergon has provided no information that demonstrates that the incremental complexity involved in managing the potential differences in assets in different environmental zones will materially add to the challenges that all service providers face.

Additionally we note that the majority of the comparison firms (AusNet services, Powercor, and SA Power Networks) are predominantly rural service providers that must operate in environmentally diverse circumstances.

However, as this factor satisfies the exogeneity and duplication OEF criteria, we have included it in our OEF adjustment for immaterial factors. As the majority of comparison firms are rural service providers, the customer weighted average comparison firm is likely to operate in a service area with a more variable climate than ActewAGL. An OEF adjustment for environmental variability is also likely to satisfy the exogeneity and

⁷¹³ Ergon Energy, Regulatory Proposal: Attachment 0A.01.01, 31 October 2014, pp. 12-13.

materiality OEF adjustment criteria. Differences in environment within a network's service are beyond service providers' control and Economic Insights' SFA model does not capture differences in environmental variability. As a result we have provided a negative 0.5 per cent adjustment to ActewAGL in our OEF adjustment for immaterial factors.

Extreme weather events

We are not satisfied that an OEF adjustment for differences in exposure to extreme weather events would meet the materiality OEF adjustment criterion.

In support of its 2014 regulatory proposal, Ausgrid submitted a report by Evans and Peck that identified major weather events as an OEF that may affect benchmarking results.⁷¹⁴ Evans and Peck present analysis from the Bureau of Transport Economics (BTE) that estimate the magnitude of the costs imposed by disasters in Australia. These costs include the estimated costs of bushfires, cyclones, earthquakes, floods, landslides, and severe storms in Australia over the period 1967-1999.⁷¹⁵

In our draft decision we did not provide an OEF for extreme weather events.⁷¹⁶ This is because they are not likely to create material differences in opex between ActewAGL and the comparison firms. On the basis of the data from the BTE, the average annual economic impact of severe storms is low in the ACT, Victoria, and South Australia. ActewAGL did not make any submissions on our draft position for this OEF.

However, we have included this factor in our adjustment for immaterial factors. It satisfies the exogeneity and duplication criteria. Service providers cannot control the weather and Economic Insights' SFA model does not include variables that account for the effects of extreme weather. As the impact of extreme weather events is higher in Victoria and South Australia than in the ACT, when normalised for gross state product, we have provided a negative 0.5 per cent adjustment for extreme weather events.

Grounding conditions

We are not satisfied that an OEF for grounding conditions would meet the materiality OEF adjustment criterion. The installation of earth grids is a very small part of service providers' costs. There is no evidence to suggest that there are material differences in grounding conditions between ActewAGL and the comparison firms.

Electricity distribution requires the use of earthing or grounding connection to aid in the protection and monitoring of the network. In rural areas, service providers use the earth as the return path for some forms of electricity distribution. These systems require

⁷¹⁴ Evans and Peck, *Review of factors contributing to variations in operating and capital costs structures of Australian service providers*, November 2012, pp. 66-7.

⁷¹⁵ Evans and Peck, *Review of factors contributing to variations in operating and capital costs structures of Australian service providers*, November 2012, p. 66.

⁷¹⁶ We considered this factor under the title natural disasters in our draft decision.

service providers to create an electrical earth, usually from embedding conductors or rods in the ground. The effectiveness of these earths varies depending on the soil type and the amount of moisture in the soil.

In our draft decision we did not provide an OEF adjustment for grounding conditions. This was on the basis that the installation and maintenance of earth grids are a very small part of service provider's costs.

In response to our draft decision, we received no evidence that there are differences in grounding costs between ActewAGL and the comparison firms that would lead to material differences in opex.

However, in accordance with our treatment of immaterial OEFs we have provided a positive 0.5 per cent adjustment for differences in grounding conditions. An adjustment for grounding conditions would satisfy the exogeneity and duplication OEF criteria. Soil conditions are beyond service providers' control and Economic Insights' SFA model does not have a variable that accounts for them. We have provided a positive 0.5 per cent adjustment because it is unclear if differences in grounding conditions will lead to a cost advantage or disadvantage for ActewAGL relative to the comparison firms.

Humidity and rainfall

We are not satisfied that an OEF for differences in humidity and rainfall would meet the materiality OEF adjustment criterion. Differences in humidity between ActewAGL and the comparison firms are unlikely to lead to material differences in opex. This is because the conditions faced by ActewAGL and the comparison firms are similar and differences in humidity are will have a greater impact on asset replacement rather than maintenance costs.

In response to our draft decision, Essential Energy submitted that we had not taken into account differences in the rate of fungal rot.⁷¹⁷ Essential Energy presented two maps produced by the CSIRO that indicate that wooden objects in areas of coastal Northern NSW are more prone to fungal rot than Victoria. Essential Energy stated this would lead to greater pole maintenance costs. Essential Energy provided no quantification of the impact that these differences would have on costs. We note that those maps indicate that wooden objects in ActewAGL and the comparison firms' assets are at similar risk of fungal rot, with assets in North Western Victoria and northern South Australia being at less risk.

In response to questions from the AER about the effect of rainfall and humidity on poles, cross arms, transformers and assets using SF6 as an insulator, Ergon Energy submitted that high rainfall and humidity increases the degradation of timber assets.⁷¹⁸ It also submitted that asset failures in high rainfall areas make up 40 per cent of asset

⁷¹⁷ Essential Energy, Revised Proposal: Attachment 7.4, 20 January 2015, p. 30 to 31.

⁷¹⁸ Ergon Energy, Response to information request ERG018(3), 30 January 2015.

failures although they only make up five per cent of the area of Queensland.⁷¹⁹ Ergon Energy also stated that it has a special inspection program for pole tops in areas that have rainfall of above 1500mm per annum. This leads to inspection costs being higher for poles in its higher rainfall areas. Ergon Energy did not provide evidence that rainfall or humidity would affect maintenance costs for transformers and assets using SF6 as an insulator.

We do not consider that differences in susceptibility to fungal rot will lead to material differences in opex between the comparison firms and ActewAGL. As mentioned above both the ACT, Victoria, and the areas where SA Power Networks has most of its assets are at similar risk of fungal rot. Also, even if there were differences in fungal rot rates the impact of those differences on opex would not be material. This is because fungal rot is more likely to lead to increased pole replacement than increased maintenance costs. Maintenance activities for poles are predominantly inspection and antifungal treatment. These are generally carried out at the same time.

The Victorian service providers are required to inspect their assets every three years in Hazardous Bushfire Risk Areas and every five years in Low Bushfire Risk Areas.⁷²⁰ This practice has been in place since 2011.⁷²¹ ActewAGL generally inspects its pole and pole top assets every three and a half to four and a half years.⁷²²

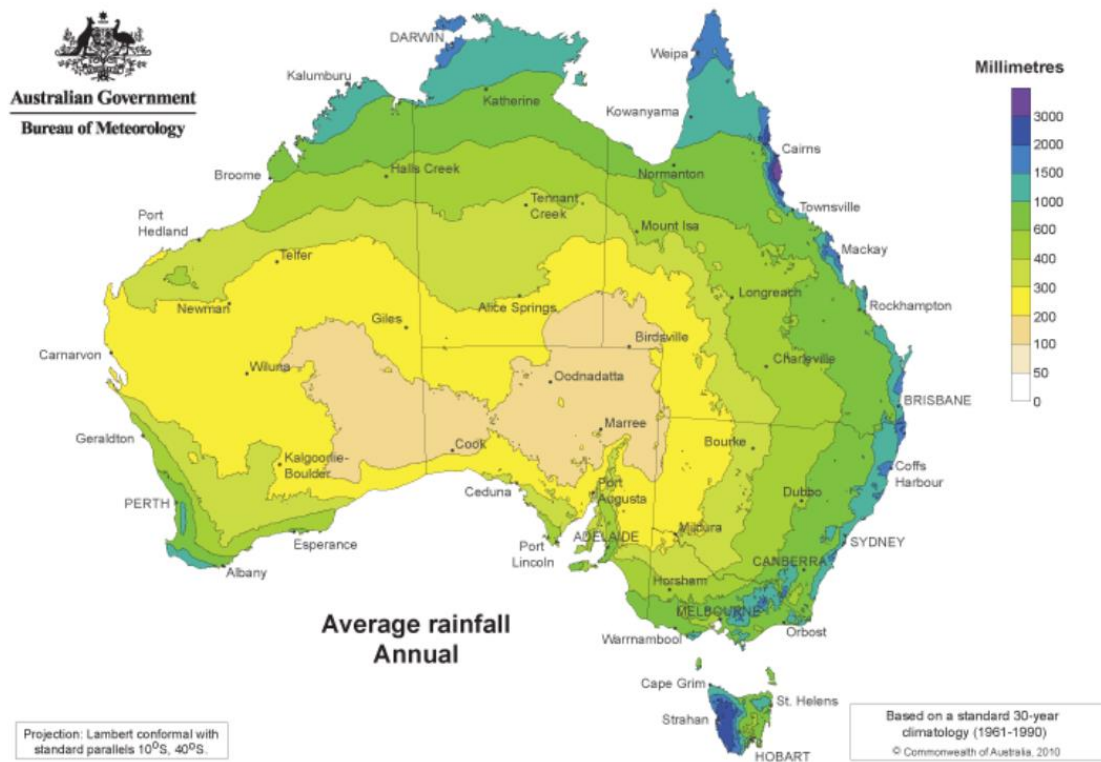
We do note that the Ergon Energy carries out more expensive crossarm inspections in high rainfall areas. However, Ergon Energy has provided no evidence to indicate that the benefit of these inspections outweighs the additional costs relative to the aerial inspections used by other service providers to inspect crossarm health. Further in the case of ActewAGL, none of its network is subject to average rainfalls in excess of 1500mm a year. See Figure A.23 below.

⁷¹⁹ Ergon Energy, Response to information request ERG018(3), 30 January 2015, p. 5.

⁷²⁰ Electricity Safety (Bushfire Mitigation) Regulations 2013, Regulation 6.

⁷²¹ Electricity Safety Amendment (Bushfire Mitigation) Regulations 2011, Regulation 7.

⁷²² ActewAGL, Response to Category Analysis RIN template 2.8 (2013-14).



Source: Bureau of meteorology⁷²³

To the extent that differences in humidity lead to increased rates of timber degradation our repex model takes this into account by using observed replacement rates as the basis for forecast replacement quantities.

On balance, we are not satisfied that differences in rainfall and humidity are likely to lead to material increases in opex between ActewAGL and the comparison firms. However, we consider that the decreased susceptibility of timber to fungal rot in parts of North Western Victoria and the northern parts of South Australia may indicate ActewAGL has a marginal cost disadvantage relative to the comparison firms. An adjustment for humidity and rainfall would satisfy the exogeneity and duplication criteria. The weather and climate are beyond the control of service providers and there is no variable in Economic Insights' SFA model that accounts for differences in humidity between the NEM service providers. In accordance with our approach to immaterial OEFs, we therefore consider it appropriate to provide a positive 0.5 per cent adjustment for humidity and rainfall to ActewAGL.

Skills required by service providers

We are not satisfied that an OEF adjustment for differences in skills required by service providers would meet the materiality OEF adjustment criterion. Differences in the skills

⁷²³ Bureau of Meteorology, Annual Rainfall Average: Product Code: IDCJCM004, available at http://www.bom.gov.au/isp/ncc/climate_averages/rainfall/index.jsp [last accessed 18 March 2015].

required by service providers are not likely to lead to material differences in costs. All service providers require broadly the same skills.

As service providers operate in different environments, they may require different skills. For example, rural networks may hire pilots to carry out asset inspections and transport staff and equipment. However, overall, service providers require employees with similar qualifications and skills. We note that we are benchmarking the same core services provided by all networks.

In our draft decision we did not provide an adjustment for these reasons. We received no new substantive submissions on this OEF in response to our draft decision.

We have included this factor as part of the allowance for immaterial OEFs. This is because although differences in the skills required by service providers are unlikely to lead to material differences in opex, it is logical that there will be some differences. An adjustment for differences in skills required would satisfy the exogeneity OEF adjustment criterion. Different environmental conditions may require specialised expertise not required by other NEM service providers. Also differences in the skills required are not accounted for in Economic Insights' SFA model. As there is uncertainty as to which service providers will have cost advantages on this OEF we have provided a positive 0.5 per cent OEF for differences in skills required by service providers.

Termite exposure

We are not satisfied that an OEF adjustment for differences in termite exposure between ActewAGL and the comparison firms would meet the materiality OEF adjustment criterion. The differences in termite management costs between ActewAGL and the comparison firms are not likely to be material.

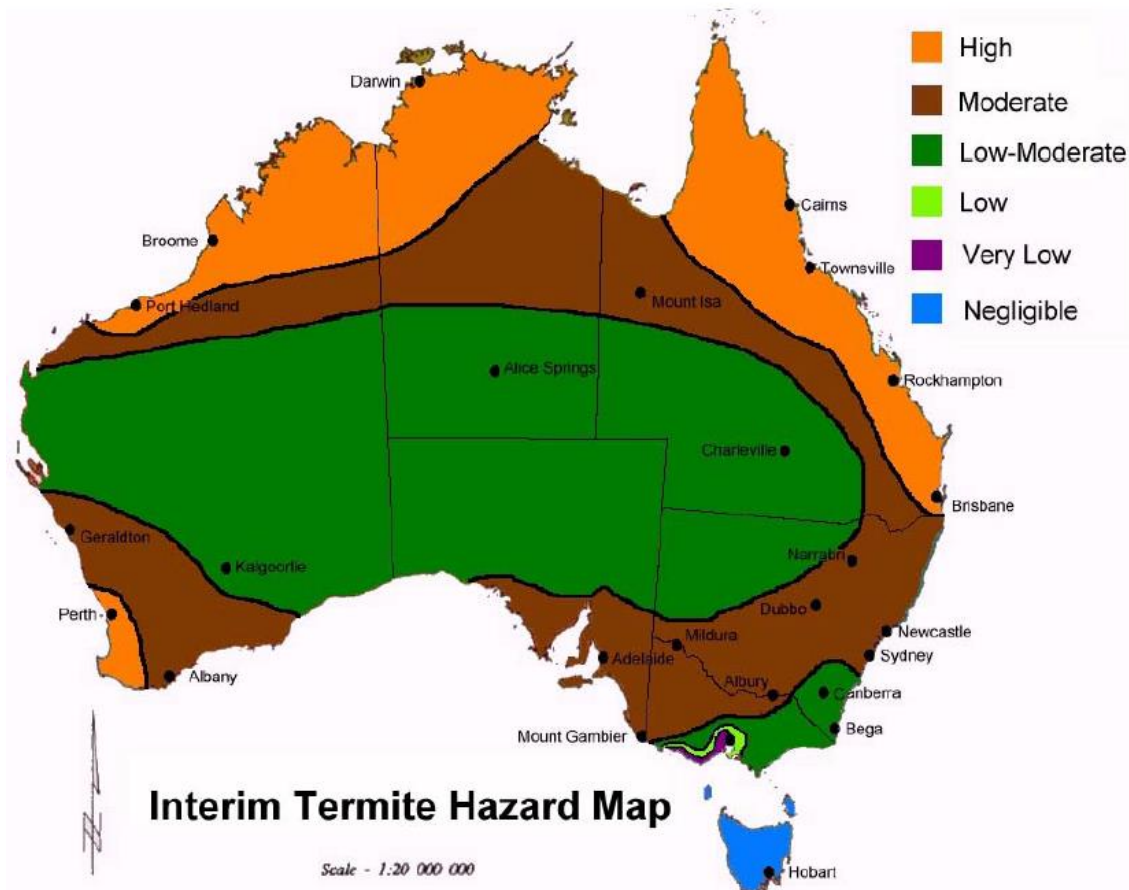
In response to our draft decision, ActewAGL's consultant, Huegin, raised termites as an OEF that may lead to differences in opex between the service providers.⁷²⁴ Ergon Energy also raised this point in its regulatory proposal.⁷²⁵ Both Huegin and Ergon Energy submitted different maps to substantiate their claims. It is not clear what the source of the data behind these maps are.

The CSIRO has published a similar map,⁷²⁶ based on surveys of the incidence of termites and termite infestations of dwellings across Australia. It is shown below in Figure A.24.

⁷²⁴ Huegin, *Response to draft determination on behalf of NNSW and ActewAGL - Technical response to the application of benchmarking by the AER*, January 2015, p. 47.

⁷²⁵ Ergon Energy, *Regulatory Proposal: Attachment 0A.01.01*, pp. 15-16.

⁷²⁶ Cookson, L.J. and Trajstman, A.C., *Termite Survey and Hazard Mapping*, June 2002, p. 34.



In its 2011 regulatory proposal, Powercor requested a step change for increased expenditure on treating termite infested poles. Powercor forecast that over the 2011 to 2015 period its average annual expenditure on termite management would be \$0.3 million (\$2010) per year.⁷²⁷ Using this figure in conjunction with data from Powercor's response to the Category Analysis RIN, this indicates that the average cost of termite treatment per wooden pole for Powercor is around 96 cents per annum (\$2013/14). Ergon Energy, also provided some information that shows the average opex for responding to asset failures caused by termites was 22.7 per cent of the cost of treating infested poles for the 2011/12 to 2013/14 period.⁷²⁸ Therefore we estimate that the average total cost of treating infested poles and responding to termite induced asset failures is \$1.18 per wooden pole for Powercor.⁷²⁹

We estimated termite management costs for ActewAGL and the comparison firms. We multiplied the unit cost of treatment for Powercor by different rates, depending on the

⁷²⁷ AECOM, Climate change impact assessment on Powercor Australia for 2011–2015 EDPR, 30 September 2009, pp. 70–75.

⁷²⁸ Ergon Energy, Response to AER Information Request AER ERG 018(4), 6 February 2015, p. 2.

⁷²⁹ $1.18 = 0.96 * 1.227$.

location of the relevant firm and infestation rates from the CSIRO.^{730 731} This was to account for differences in infestation rates across service areas.

We estimate that ActewAGL would spend \$0.4 (\$2013/14) more per pole than the weighted average of the comparison firms for termite management. Multiplying the marginal termite management cost per wooden pole by the number of wooden poles for ActewAGL,⁷³² provides an estimate of the value of the cost disadvantage. We estimate ActewAGL spends \$13 388 (2013/14) more than the weighted average of the comparison firms for termite management each year. Adding this to the efficient opex determined by the SFA model, suggests ActewAGL has a 0.04 per cent cost advantage relative to the comparison firms.

Although the effect of termites on ActewAGL's opex is immaterial, in accordance with our approach to quantifying immaterial OEFs, we will provide an OEF adjustment that reflects the quantified impact. An OEF adjustment for termite management would satisfy the exogeneity and duplication OEF adjustment criteria. The range of termites is beyond service providers' control and there are no variables in Economic Insights' SFA model that account for difference in termite exposure. As a result we consider that an OEF adjustment of 0.04 per cent is appropriate.

Topography

We are not satisfied that an OEF adjustment for topography would meet the materiality OEF adjustment criterion. Differences in topography between the service providers are not likely to lead to material differences in opex.

Our draft decision did not make any adjustment for topography. In response to our draft decision, we received no evidence that ActewAGL incurs greater opex costs than the comparison firms due to differences in topography.

Adverse topographical conditions may affect some NEM service providers. For example, the Great Dividing Range runs through some distribution network areas. Operating in mountainous regions may lead to higher costs in some operating areas such as maintenance, emergency response, and vegetation management due to access issues, even if this is not likely to be a material cost. We note that AusNet Services, the comparison service provider at the benchmark comparison point, has a similarly mountainous operating environment to ActewAGL. However, most of the comparison service providers operate in a relatively flat area compared to ActewAGL. Therefore, ActewAGL may have a cost disadvantage relative to the comparison service providers due to topography.

⁷³⁰ Cookson, L. J. and Trajstman, A. C., Termite Survey and Hazard Mapping, June 2002, pp. 6 and 29.

⁷³¹ We assumed ActewAGL, AusNet, CitiPower, and UED were respectively 93 per cent, 93 per cent, 42 per cent, and 52 per cent as likely to be affected by termites as Powercor. These are based on incidence rates from Cookson and Trajstman's termite survey.

⁷³² The number of wooden poles for each service provider was taken from the category analysis RIN responses.

In response to our draft decision, we received no evidence that ActewAGL incurs greater opex costs than the comparison firms due to differences in topography.

However, in accordance with our treatment of immaterial OEFs we have provided a positive 0.5 per cent adjustment for differences in topography. An adjustment for topography would satisfy the exogeneity and duplication OEF criteria. The landforms in service providers' network areas are beyond their control and there is no variable in Economic Insights' SFA model to account for differences in topography. We have provided a positive 0.5 per cent adjustment because it is unclear if differences in topography will lead to a cost disadvantage for ActewAGL relative to the comparison firms.

A.6.8 Jurisdictional factors

Building regulations

We are not satisfied that an OEF adjustment for differences in building regulations across jurisdictions would meet the materiality OEF criterion. The Building Code of Australia (BCA) provides a set of nationally consistent, minimum necessary standards of relevant safety (including structural safety and safety from fire), health, amenity and sustainability objectives for buildings and construction.⁷³³

The Australian Building Codes Board (ABCB) is a Council of Australian Government standards writing body that is responsible for the National Construction Code (NCC) that comprises the BCA and the Plumbing Code of Australia (PCA). It is a joint initiative of all three levels of government in Australia and was established by an intergovernment agreement (IGA) signed by the Commonwealth, States and Territories on 1 March 1994. Ministers signed a new IGA, with effect from 30 April 2012.⁷³⁴ The BCA contains technical provisions for the design and construction of buildings and other structures, covering such matters as structure, fire resistance, access and egress, services and equipment, and energy efficiency as well as certain aspects of health and amenity.⁷³⁵

For these reasons we did not provide an OEF adjustment for Building regulations in our draft decision.

We are still satisfied that an OEF adjustment for differences in building regulations between ActewAGL and the comparison firms does not satisfy the materiality OEF adjustment criterion. We were unable to identify any building regulations that would lead to material differences in opex. ActewAGL did not submit evidence that

⁷³³ ABCB, The Building Code of Australia, available at; <http://www.abcb.gov.au/about-the-australian-building-codes-board> . [last accessed 4 September 2014].

⁷³⁴ ABCB, About the Australian Building Codes Board, available at; <http://www.abcb.gov.au/about-the-australian-building-codes-board> . [last accessed 4 September 2014].

⁷³⁵ ABCB, The Building Code of Australia, available at; <http://www.abcb.gov.au/about-the-australian-building-codes-board> . [last accessed 22 March 2015].

demonstrated that there were material differences. However, in accordance with our treatment of immaterial OEFs we have provided a positive 0.5 per cent adjustment for differences in building regulations. An adjustment for differences in building regulations would satisfy the exogeneity and duplication OEF adjustment criteria. Building regulations are not determined by service providers and there are no variables in Economic Insights' SFA model that account for differences in them. We have provided a positive 0.5 per cent adjustment in our collective adjustment for immaterial OEFs because it is unclear if building regulations will lead to a cost advantage or disadvantage for ActewAGL relative to the comparison firms.

Cultural heritage

We are not satisfied that an OEF adjustment for differences in cultural heritage management across jurisdictions would meet the materiality OEF adjustment criterion. We do not see evidence to suggest that differences in cultural heritage management requirements would lead to material differences in opex.

In response to questions from the AER on the OEFs that materially affect its costs, Ergon Energy submitted that cultural heritage obligations impose additional management and operational costs on it.⁷³⁶ Specifically Ergon Energy identified staff training and awareness, special alert and management processes and additional operational precautions for native title cultural heritage. Ergon Energy provided a map showing areas where native title has been found to exist and where claims have been made. Ergon Energy did not quantify the costs it incurs for its native title or other cultural heritage programs.

Many service providers have cultural heritage obligations. For example, the Victorian service providers most comply with the *Planning and Environment Act 1987*, the *Heritage Act 1995*, and the *Aboriginal Heritage Act 2006* in providing services. ActewAGL has not provided evidence to suggest the costs it incurs to meet its obligations will be materially different to comparison firms.

Therefore we are not satisfied that differences in cultural heritage obligations will lead to material differences in opex between ActewAGL and the comparison firms. However, there is likely to be some differences in obligations that will lead to immaterial differences in opex. An adjustment for differences in cultural heritage obligations would also satisfy the exogeneity and duplication OEF adjustment criteria. Cultural heritage obligations are not determined by service providers and there are no variables in Economic Insights' SFA model that account for differences in them. As the direction of cost advantage is unclear, we have included an adjustment of positive 0.5 per cent for differences in cultural heritage obligations in our adjustment for immaterial factors.

⁷³⁶ Ergon Energy, Response to AER information request Ergon 002, 17 December 2014, p. 7-9

Environmental regulations

We are not satisfied that an OEF adjustment for differences in environmental regulations across jurisdictions would meet the materiality OEF adjustment criterion. Environmental regulations are not likely to create material differences in costs between ActewAGL and the comparison firms.

In our draft decision, we investigated how environmental regulations may lead to material differences for the opex that service providers require, but were unable to find any reliable evidence that such differences exist. The way various jurisdictions administer environmental regulation varies considerably.⁷³⁷ While the Commonwealth has some involvement, most environmental planning functions are carried out by state or local governments. We consider it is likely that differences in environmental regulations faced by service providers will lead to differences in costs, but we do not have any evidence to suggest that these differences will lead to material differences in opex.

In response to our draft decision, Ausgrid stated that our opex forecast would not provide it with sufficient opex to manage its environmental programs. Programs it stated would be affected include:

- contaminated site assessment
- oil containment installation and maintenance
- environmental civil works
- fluid filled cable maintenance and replacement
- washbay monitoring and maintenance
- water treatment plant monitoring and maintenance
- Polychlorinated biphenyl removal programs.⁷³⁸

Essential Energy raised the same issues.⁷³⁹ Endeavour Energy did not raise all of the issues raised by Ausgrid and Essential Energy, but it did raise contaminated site assessment and oil containment, installation and maintenance.⁷⁴⁰ Neither Ausgrid, Endeavour Energy, or Essential Energy quantified the opex associated with these programs.

ActewAGL also submitted that environmental obligations in the ACT differ.⁷⁴¹ However, ActewAGL did not explain how its obligations differ or provide any evidence that any differences, to the extent that they exist, will lead to material differences in opex.

⁷³⁷ Productivity Commission, *Performance Benchmarking of Australian Business Regulation: Local Government as Regulator*, July 2012, p. 386-390.

⁷³⁸ Ausgrid, Revised Regulatory Proposal: Attachment 1.15, 20 January 2015, p. 1.

⁷³⁹ Essential Energy, Revised Regulatory Proposal: Attachment 1.9, 20 January 2015, p. 3.

⁷⁴⁰ Endeavour Energy, Revised Regulatory Proposal, 20 January 2015, pp. 37-38.

⁷⁴¹ ActewAGL, Revised Proposal, 20 January 2015, p. 3.

While Ausgrid provided an explanation of the works it must undertake, it did not provide evidence that there are any differences in the scope of those works relative to the comparison firms. Additionally it did not provide evidence that any differences in the scope of environmental impact mitigation works, to the extent that they exist, would lead to material differences in opex.

All of the NEM service providers undertake similar environmental impact mitigation activities to those identified by Ausgrid. While the relative expenditure of these activities may vary across service providers, they are practices that are common industry wide. This, in conjunction with our benchmarking results, suggests that the comparison firms undertake similar activities at lower cost. We do note that some service providers may have already finished their PCB removal programs. Additionally, although small area water treatment as it relates to substations is common, large scale water treatment is not a common practice. Ausgrid did not provide any evidence that its water treatment plant monitoring and maintenance program related to large scale water treatment.

We are not satisfied that an OEF adjustment for differences in environmental regulations between ActewAGL and the comparison firms meets the materiality OEF adjustment criterion. We were unable to identify any environmental regulations that would lead to material differences in opex. ActewAGL also did not submit evidence that demonstrated that there were material differences.

However, in accordance with our treatment of immaterial OEFs we have provided a positive 0.5 per cent adjustment for differences in environmental obligations. An OEF adjustment for environmental obligations would satisfy the exogeneity and duplication OEF criteria. Environmental obligations are not determined by service providers and Economic Insights' SFA model does not include any variables that account for differences in them. We have provided a positive 0.5 per cent OEF in our collective adjustment for immaterial OEFs because it is unclear if environmental obligations will lead to a cost advantage or disadvantage for ActewAGL relative to the comparison service firms.

Occupational Health and Safety regulations

We are satisfied that it is necessary to provide ActewAGL with a positive 0.5 per cent OEF adjustment for differences in Occupational Health and Safety Regulations (OH&S). This is because an OEF adjustment for OH&S regulations satisfies all three OEF adjustment criteria. OH&S regulations are outside of the control of service providers. Differences in OH&S regulation are likely to create material differences in opex between ActewAGL and the comparison firms. Economic Insights' SFA model does not account for differences in OH&S regulations.

We provided an OEF adjustment for OH&S regulations in our draft decision for the above reasons. Details on the quantification of our OH&S adjustment can be found in

our draft decision. The quantification was based on findings from a report by PwC.⁷⁴² This report was commissioned by the Victorian Government to estimate the cost to the Victorian economy of transitioning to the Work Health and Safety (WHS) Laws that apply in the other NEM jurisdictions.

In response to our 2014 draft decision for the NSW service providers, Ergon Energy's consultant, PwC, made a submission on our adjustment for differences in jurisdictional OH&S differences.⁷⁴³ PwC made four observations on our application of its findings to estimate an OEF adjustment for differences in OH&S obligations. PwC stated that its report on the impact of the WHS laws only considered the potential costs borne by Victorian businesses. It stated that the total cost of complying with the new WHS laws was not considered. It stated that its findings do not directly reflect costs facing network service providers. It also considered normalising the annualised cost by Victoria's Gross State Product (GSP) could be misleading. We address each of these comments below.

The OEF adjustment for OH&S obligations is designed to quantify the effect of the cost advantage that the Victorian service providers have over other service providers. As the report estimates the cost of transitioning to the WHS laws for Victoria, it provides an estimate of the cost avoided by Victorian businesses by not having to comply with the WHS laws. We also note that PwC has provided no evidence that the costs of complying with the WHS laws would be different in Queensland than Victoria.

It is not appropriate to consider the total cost of complying with and implementing the WHS laws for the purpose of an OEF adjustment. OEF adjustments are not required for non-recurrent costs. Providing an OEF for non-recurrent costs treats those costs as if they were recurrent. Economic Insights' benchmarking results are used as the basis for our forecast of opex. If we adjust the benchmarking results with an OEF adjustment for non-recurrent costs, it has the effect of including those non-recurrent costs in our forecast of opex. Essentially, providing an OEF adjustment for non-recurrent costs leads to those costs being treated as recurrent costs. This is not appropriate because it would provide an allowance for costs that will not be incurred.

The challenges in safely operating high voltage assets that network service providers must take into account will be similar to those that power generators face. Although PwC's report's findings show that the costs of adopting the laws are not uniformly distributed across Victorian businesses we have taken steps to account for this. We adjusted the average impact across the Victorian economy to reflect the observed differences between most firms surveyed and the business type that most resembled the network service providers: power generators. We note that network service providers are likely to incur higher costs for OH&S obligations than power generators due to their scale. This is why we adopted a percentage adjustment, calculated using

⁷⁴² PricewaterhouseCoopers, *Impact of the Proposed National Model Health Work and Safety Laws in Victoria*, April 2012.

⁷⁴³ PricewaterhouseCoopers, *Review of AER's methodology of adjusting for differences in occupational health and safety obligations*, 12 February 2015.

the average cost to the Victorian economy,⁷⁴⁴ rather than the average annualised cost per power generator, which was only \$5,210 (\$2011-12). PwC did not propose an alternative method to account for differences between the state average and network service providers.

Using Victorian Gross State Product (GSP) to estimate the materiality of regulatory changes within Victoria is appropriate. Volatility in growth rates across states will not affect this. We estimated the percentage of goods and services produced in Victoria that the annualised increase in OH&S costs would have accounted for if they were incurred in 2012. The estimate of GSP used was from 2012. The estimates of compliance costs which formed the basis for PwC's report were also from financial year 2012. Because we are comparing two figures that relate to the same state, variability between states will not affect the comparison.

Planning regulations

We are not satisfied that an OEF adjustment for differences in planning regulations across jurisdictions would meet the materiality OEF adjustment criterion. Differences in planning regulations are not likely to create material differences in opex across jurisdictions.

In our draft decision we did not provide an OEF adjustment for differences in planning obligations. This was on the basis of the findings of a Productivity commission review of the impact of planning regulations on businesses across Australia.⁷⁴⁵ The finding of this review was that given the extent of differences, it is a challenge to compare the planning systems of the states and territories: individual indicators are often heavily qualified and thus so are comparisons between jurisdictions.⁷⁴⁶ As a result, the Productivity Commission did not attempt to construct an overall 'league table' of state and territory performance.⁷⁴⁷ This suggests that although planning regulations differ across jurisdictions, and are therefore likely to create some differences in costs, that differences in planning regulations are not likely to lead to material differences in costs.

⁷⁴⁴ The annual costs forecast by PwC for the implementation of the new OH&S laws were equivalent to 0.24 per cent of the Gross State Product of Victoria in financial year 2012. Because electricity distribution work environments may present more danger than the average work environment across the economy we multiplied this amount by 2.5. The PwC report suggests that the annualised ongoing costs for power generators would be almost two and a half times greater than for the majority of other businesses. This suggests that the Victorian service providers have a 0.6 per cent cost advantage relative to the other NEM service providers. However, as SA Power Networks accounts for 21 per cent of the comparison firm's customers, the customer weighted average cost advantage the comparison firms have is 0.5 per cent.

⁷⁴⁵ Productivity Commission, *Performance Benchmarking of Australian Regulation: Review of Planning Regulations*, April 2011.

⁷⁴⁶ Productivity Commission, *Performance Benchmarking of Australian Regulation: Review of Planning Regulations*, April 2011, Volume 1, p. XXVIII.

⁷⁴⁷ Productivity Commission, *Performance Benchmarking of Australian Regulation: Review of Planning Regulations*, April 2011, Volume 1, p. XXXI.

In response to our draft decision ActewAGL submitted that planning obligations in the ACT differ.⁷⁴⁸ ActewAGL submitted that because it must comply with the Griffin plan, which requires it to locate electricity distribution assets on the periphery of built up areas, its network has more subtransmission and zone substations than others.⁷⁴⁹ We note that we consider subtransmission below in our consideration of network factors, and that transformer capacity is captured by the ratcheted maximum demand variable.

ActewAGL does not explain how its other obligations differ or provide any evidence that any differences, to the extent that they exist, will lead to material differences in opex.⁷⁵⁰

We are not satisfied that an OEF adjustment for differences in planning regulations between ActewAGL and the comparison firms meets the materiality OEF adjustment criterion. We were unable to identify any planning regulations that would lead to material differences in opex nor was ActewAGL.

However, in accordance with our treatment of immaterial OEFs we have provided a positive 0.5 per cent adjustment for differences in planning obligations. An OEF adjustment for difference in planning regulations would meet the exogeneity and duplication OEF adjustment criteria. Planning regulations are not determined by service providers and Economic Insights' SFA model does not include variables to account for differences in planning regulations. We have provided a positive 0.5 per cent adjustment because it is unclear if planning obligations will lead to a cost advantage or disadvantage for ActewAGL relative to the comparison service firms.

Taxes and Levies

We are not satisfied that an OEF adjustment for differences in jurisdictional taxes between the ACT, Victoria and South Australia would meet the duplication OEF criterion. Taxes and levies are accounted for elsewhere.

In our draft decision we provided an OEF adjustment for differences in jurisdictional taxes between the ACT and the comparison firms. This was on the basis that the Energy Industry Levy imposed on ActewAGL is a jurisdictional scheme not applicable in other jurisdictions.

Providing an OEF for Taxes and Levies would double count the value of the Energy Industry Levy (EIL). It has come to our attention that ActewAGL will be recovering the EIL through its annual pricing variation. That is, the EIL is not included in the distribution revenue requirement for the 2015–2019 period.⁷⁵¹ As our opex forecast is based on Economic Insights' benchmarking results, if we adjust the results with an OEF adjustment for the EIL, it has the effect of including the EIL in our forecast of

⁷⁴⁸ ActewAGL, Revised Proposal, 20 January 2015, p. 3.

⁷⁴⁹ Stephen Devlin, Witness Statement, 13 February 2015, p. 8.

⁷⁵⁰ ActewAGL, Revised Proposal, 20 January 2015, p. 3.

⁷⁵¹ ActewAGL, Regulatory Proposal, p. 56.

opex. Essentially, providing an OEF adjustment for the EIL leads to those costs being treated as recurrent costs. This is not appropriate because it would lead to a forecast of opex including costs that ActewAGL will recover elsewhere.

Traffic management

We are not satisfied that an OEF adjustment for traffic management would meet the materiality or duplication OEF adjustment criteria. Traffic management requirements across Australia are based on a nationally consistent standard. Differences in traffic management costs related to density will be captured by Economic Insights' SFA model.

Traffic management is the direction of motorist and pedestrian movements around worksites using temporary traffic signage and traffic controllers.

State and territory road authorities generally base their traffic control at roadwork sites requirements on AS1742 Part 3: Guide to traffic control devices for works on roads.⁷⁵² Therefore cost differences due to jurisdictionally differences will be immaterial.

Traffic management costs generally correlate with the volume of traffic near the worksite. We consider that traffic management will have a greater overall impact on expenditure in higher density areas than in lower density areas. Economic insights' SFA model accounts for differences in customer density. For more detail see our consideration of customer density above and in our draft decision.

In response to our draft decision we received no evidence to suggest that differences in traffic management practices in the ACT, Victoria, and SA lead to material differences in opex.

We have included jurisdictional differences in traffic management in our adjustment for immaterial factors. Although the density related differences in traffic management are captured in Economic Insights' SFA model, the jurisdictional differences in requirements are not. These jurisdictional differences are likely to lead to some difference in cost and are not determined by service providers. As a result an OEF adjustment for traffic management would satisfy the exogeneity OEF adjustment criterion. Also, because Economic Insight's SFA model does not account for differences in traffic management regulations it would satisfy the duplication OEF adjustment criterion. Therefore, we have provided included a 0.5 per cent adjustment for ActewAGL in our consideration of immaterial factors.

A.6.9 Network factors

Advanced metering infrastructure

We are not satisfied that an OEF adjustment for differences in Advanced Metering Infrastructure (AMI) deployments would meet the OEF adjustment criteria. Pursuing the ability to share overheads between network services and other services is a

⁷⁵² National Approach to Traffic Control at Work Sites, Publication no: AP-R337/09, Austroads 2009, p1.

business decision on service diversification. The ability to share overheads between network services and metering services are not likely to lead to material differences in network services opex. AMI costs are excluded from network services opex, which is the measure of opex used in Economic Insights SFA model.

Advanced metering infrastructure is another term for smart meters. Smart meters are electricity usage meters that communicate meter readings directly to electricity service providers, eliminating the need for staff to read meters in person.

In response to our draft decision, Advisian, suggested the point that the Victorian service providers can share their fixed overhead costs with their AMI programs.⁷⁵³ Huegin also noted that Ofgem excludes costs related to smart meter deployments.⁷⁵⁴

Advisian considers that this gives the Victorian service providers a cost advantage relative to ActewAGL. ActewAGL also provides metering services, but is not making a major change in its metering fleet in the way the Victorian service providers are. Overhead costs are often shared on the basis of costs incurred by functional areas. Therefore, Advisian considers the large costs involved in the AMI deployment will allow the Victorian service providers to allocate more of their overhead costs to metering than ActewAGL.

There are three issues with Advisian's analysis. The first is that the extent to which a service provider can share overheads across its services is the result of management decisions. The second is that it does not account for all of the opportunities that ActewAGL has to share overheads. The third is that it treats all shared costs as fixed.

As discussed in the unregulated services section above the extent to which ActewAGL can share overheads across services is the result of business decisions on service diversification. Therefore an OEF adjustment for differences in AMI programs would not satisfy the exogeneity OEF adjustment criterion.

As mentioned in our consideration of economies of scale, ActewAGL is able to share overhead costs across its gas, electricity, water, and retail functions. Additionally as mentioned in our section on endogenous circumstances, ActewAGL provides unregulated services. Therefore we consider that ActewAGL has ample scope to share fixed overheads across its various functions and with Jemena and ACTEW corporation.

Also fixed overheads are only a part of total overheads. As service providers increase in scale and scope they will incur more overheads. As a result, although the Victorian service providers are able to share fixed costs between network services and its AMI programs, the AMI programs also add to the pool of shared overheads.

⁷⁵³ Advisian, *Opex Cost Drivers: ActewAGL Distribution Electricity (ACT)*, 16 January 2015, pp. 83-86.

⁷⁵⁴ Huegin, *Response to draft determination on behalf of NNSW and ActewAGL - Technical response to the application of benchmarking by the AER*, January 2015, p. 23.

As a result we are not satisfied that an OEF adjustment for differences in AMI programs would meet the materiality OEF adjustment criterion.

We also note that Advisian's analysis relates to the Victorian service providers rather than the comparison firms. SA Power Networks, is also one of the comparison firms. We note that although SA Power Networks did not share its fixed overheads between network services and an AMI program, it is one of the efficient service providers under all of Economic Insights' benchmarking models.

As a result, we are not satisfied that differences in AMI deployments require an OEF adjustment. The extent to which ActewAGL shares overheads across different operations is a business decision for ActewAGL. ActewAGL has ample opportunity to share its fixed overheads across its various operations. Overhead costs have a fixed and a variable component, so AMI programs add costs to the pool of overheads as well as absorbing costs.

We are also satisfied that an adjustment for AMI deployments would not satisfy the duplication OEF criterion. Network services opex, which has been used in Economic Insights' SFA model excludes metering services costs. As metering services costs are not included in the network services costs, the efficiency scores from Economic Insights' SFA model will not be affected by metering services costs.

Asset age

We are not satisfied that an OEF for differences in asset age between ActewAGL and the comparison firms would meet the materiality OEF criterion. Asset age is not likely to lead to material differences in opex between ActewAGL and the comparison firms. Asset age is only likely to affect some opex categories. Also ActewAGL's assets seem to have a slightly higher weighted average remaining life (WARL) than the comparison firms.

Not all opex categories are affected by asset age. The opex categories that will generally be affected by differences in asset age are emergency response and routine preventative maintenance on high value assets.

The amount of maintenance opex does not increase with age for all assets. Asset age will not greatly affect maintenance opex for most assets. Low value assets, such as distribution lines and transformers make up the bulk of service providers' assets. Low value assets like these are inspected on a regular basis but they will generally not incur routine maintenance interventions in the way higher voltage assets do.⁷⁵⁵ Asset age will more often affect routine maintenance intervals for high value, strategically important, assets such as subtransmission lines and zone substations. However, maintenance on zone substations and assets operating above subtransmission lines generally only accounts for a small part of service providers' opex.

⁷⁵⁵ Energy Market Consulting Associates, Relationship between Opex and Customer density for Sparse Rural Networks, 2.3.2 Routine and Non Routine Maintenance., April 2015.

While a network with an older asset base will tend to experience more asset failures, asset failures only account for a part of emergency response costs. As assets age, they, in general, will become more likely to fail. Therefore a service provider with older assets would be more likely to incur emergency response costs for asset failure. However emergency response opex is also incurred for other occurrences including: weather, 3rd party damage to the network, vegetation, and animal contact.⁷⁵⁶

In our draft decision, we did not provide an OEF adjustment for asset age. We considered the effect of asset age on service providers' costs and we were satisfied no adjustment was necessary. In coming to this conclusion we considered estimates of the service providers' Weighted Average Replacement Lives (WARL).⁷⁵⁷ ActewAGL did not appear to have a WARL materially different to those of the comparison firms.

Since our draft, Advisian,⁷⁵⁸ Ausgrid⁷⁵⁹ and Essential Energy⁷⁶⁰ have all raised the issue of the effect of asset age on the results of Economic Insights' benchmarking.

Advisian, Ausgrid and Essential Energy stated that the AER's assessment of asset age is incorrect because the standard lives reported in the AER's RIN data do not appropriately represent the age of service providers' assets. Advisian then presented two alternative methods of measuring average network asset age. One shows the cumulative percentage of assets above the reported mean asset life and the other shows the cumulative percentage of assets over 50 years old.

Our calculation of the WARL and standard asset lives in our repex model are different to this. Rather than using the standard asset lives reported in the RINs, the standard lives assumed in the calculation of the WARL, used in our draft decision, were based on benchmark standard lives calculated by the repex model. As a result, the asset lives were not based on depreciation assumptions. They were based on the average asset lifespans realised for each asset class by the NEM service providers. Therefore the statements made by Advisian on our calculation of the WARL used in our draft decision do not hold true.

The alternative methods of presenting asset age proposed by Advisian also have drawbacks. The first method, the cumulative percentage of assets over their mean asset age, is subject to the problem Advisian considered that our calculation of the WARL was subject to. That is it is dependent on the mean asset lives reported in the category analysis RINs, which in some cases may be dependent on service providers' accounting assumptions. The second method, which compares the percentage of assets older than 50 years, is affected by, as noted by Advisian, differences in assets

⁷⁵⁶ Energy Market Consulting Associates, Relationship between Opex and Customer density for Sparse Rural Networks, 2.3.4 Emergency Response., April 2015.

⁷⁵⁷ AER, Draft Decision NSW distribution network service providers, November 2014 pp.128-129.

⁷⁵⁸ Advisian, Review of AER benchmarking: Networks NSW, 16 January 2015, pp. 73-74.

⁷⁵⁹ Ausgrid, Revised Proposal, 20 January 2015, pp. 96-97.

⁷⁶⁰ Essential Energy, Revised Proposal, 20 January, p. 186.

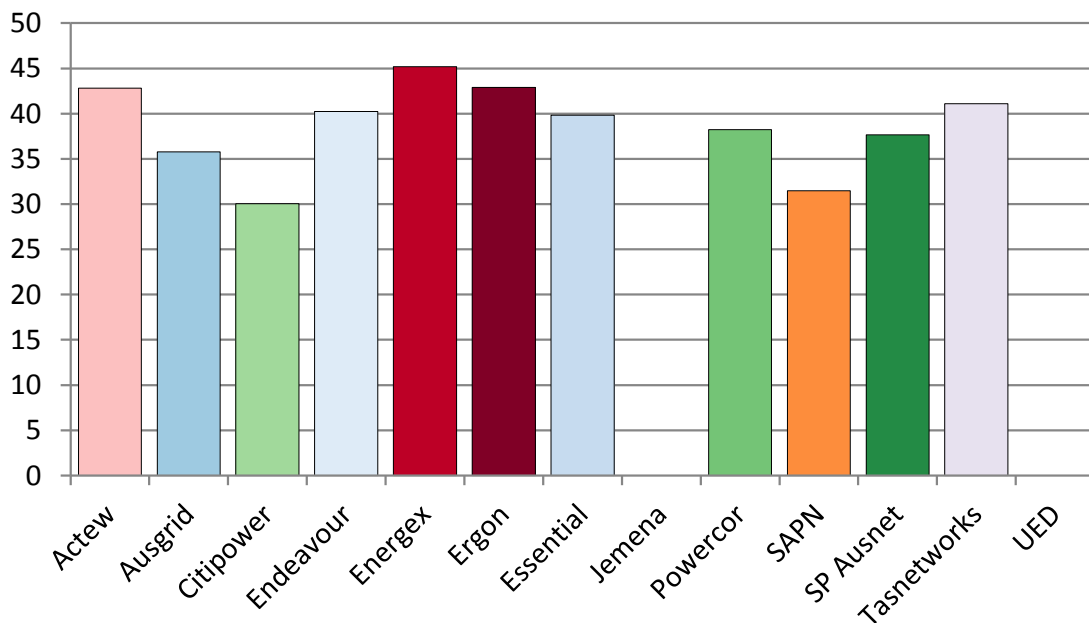
used by the service providers.⁷⁶¹ The example used by Advisian is that SA Power Networks uses Stobie poles which have long asset lives.

Our calculation of the WARL is not subject to either of these issues. As mentioned before, the asset lives in our calculation of the WARL are based on benchmarked asset lives. As a result we consider that it is a better measure for network age comparisons. Further, we note Endeavour Energy itself uses WARL measures to forecast its repex costs.⁷⁶²

Nonetheless, in considering Advisian's statements we have considered an additional measure of asset age. In addition to our consideration of the benchmark WARL used in the draft decision, we have considered a measure based on the observed level of replacement for each service provider.

The WARL in our draft decision uses benchmark unit rates and asset lives based on the unit rates and replacement rates observed across the NEM (benchmark WARL). The new measure uses service providers' own unit rates and replacement rates (observed WARL). Figure A.25 and Figure A.26 below compares all NEM service providers' on both WARLs. We note that we have excluded Jemena and United Energy because we have some concerns with some of their asset replacement data.

Figure A.25 Benchmarked Weighted Average Remaining Life for each NEM service provider

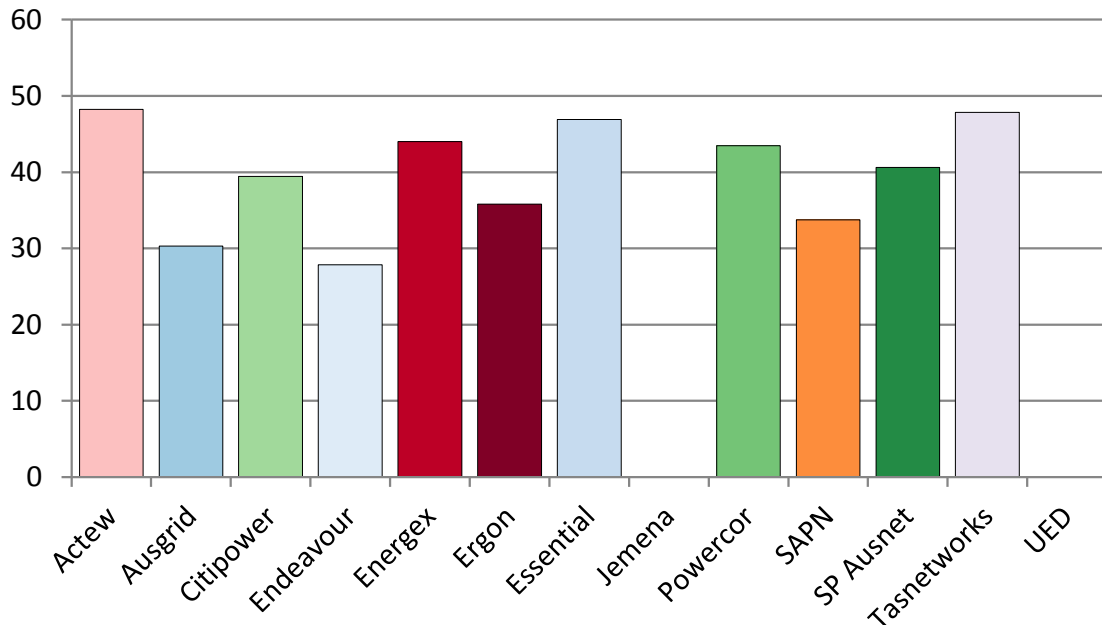


Source: Category analysis RIN data, AER Analysis

⁷⁶¹ Advisian, Review of AER benchmarking: Networks NSW, 16 January 2015, p. 75.

⁷⁶² Jacobs, Networks NSW - Draft Determination Review: System Capex & Maintenance Prudency Assessment, 15 January 2015, Appendix B.

Figure A.26 Observed Weighted Average Remaining Life for each NEM service provider



Source: Category analysis RIN data, AER Analysis

Both the benchmarked WARL and observed WARL have strengths and weaknesses as measures. The benchmarked WARL allows comparison of service providers independent of the quality of service providers' management, because the same unit costs and standard lives are used for all service providers. The observed WARL accounts for unobservable differences between service providers as it is based on the unit rates and standard lives revealed by service providers' actions over the 2009 to 2013 period.

The drawback of the benchmarked WARL is that it treats all service providers as if they operate in the same operating environment. This is because differences in service providers' operating environment will affect their asset lives and also their unit costs.

The drawback of the observed WARL is that it is affected by service providers' management strategies. This is because the unit rates and standard asset lives realised will be affected by management decisions during the sample period.

As both WARL measures have strength and weaknesses, we have considered both in comparing the relative asset ages of the NEM service providers.

ActewAGL has a higher remaining life than the comparison firms on both WARL measures. This suggests that ActewAGL's asset base is relatively further from old age than the comparison firms. As a result it is likely that ActewAGL has a cost advantage

relative to the comparison firms due to asset age. We note that Mr Devlin, ActewAGL's General Manager of Asset Management, stated that ActewAGL has a WARL of 26.3 years.⁷⁶³ Mr Devlin did not state the basis of this calculation. We consider that this estimate is too low because as explained above, the Observed WARL takes into account the observed life of ActewAGL's assets based on its replacement behaviour.

Although it will not lead to material differences in opex, asset age is likely to lead to some difference in opex between the comparison firms and ActewAGL. An OEF adjustment for asset age would also meet the exogeneity and duplication OEF adjustment criteria. The date a network was established is beyond service providers' control and there are no variables in Economic Insights' SFA model that account for it. Therefore we have included an adjustment for asset age in our adjustment for immaterial factors for ActewAGL. As ActewAGL appears to have a cost advantage we have provided a negative 0.5 per cent adjustment.

Asset volumes

We are not satisfied that an OEF adjustment for the volume of assets used to provide services over its network would meet the exogeneity or duplication OEF adjustment criteria. Network service providers have direct control over the assets that they choose to install and Economic Insights SFA model account for the drivers of asset installation.

In our draft decision we did not provide an adjustment for the volume of assets used by service providers. We examined if an OEF was required for demand supplied and line length. We concluded that Economic Insights' SFA model adequately account for these factors so no adjustment was required.

In response to our draft decision, ActewAGL, Advisian, the NSW Chief Operating Officers, and Mr Devlin submitted that the number of assets that a service provider uses to operate its network will drive its operating costs.⁷⁶⁴⁷⁶⁵⁷⁶⁶⁷⁶⁷⁷⁶⁸⁷⁶⁹ Advisian submitted that it considers that the variables in Economic Insights' SFA model ignore the cost of maintaining a larger number of assets. In particular, Advisian raised these points with regard to line length and transformer capacity. ActewAGL also submitted that it has more subtransmission than the urban comparison firms. We address line length above in our consideration of customer factors and subtransmission in our consideration of network factors.

In general, we consider that demand side variables should be used to determine the benchmark opex required. This is because it is a good measure of the capacity that a service provider must maintain to provide distribution services. Using measures driven

⁷⁶³ Stephen Devlin, Witness Statement, 13 February 2015, p.6.

⁷⁶⁴ Advisian, Review of AER benchmarking: Networks NSW, 16 January 2015, pp. 41-54.

⁷⁶⁵ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 45 -59.

⁷⁶⁶ Trevor Armstrong, Statement of Trevor Armstrong Chief Operating Officer Ausgrid, 19 January 2015, pp. 31.

⁷⁶⁷ Gary Humphreys, Statement of Gary Humphries Chief Operating Officer Essential Energy, 19 January 2015, p. 4.

⁷⁶⁸ Stephen Devlin, Witness Statement, 13 February 2015, p. 8.

⁷⁶⁹ Stephen Devlin, Witness Statement, 13 February 2015, p.8.

by the value of assets⁷⁷⁰ or volume of assets installed runs the risk of rewarding service providers for inefficiently overinvesting. As a result, such expenditure would not meet the exogeneity OEF criterion. This is because the extent of investment in assets to meet the realised customer demand is at the discretion of the service provider.

Advisian submitted that the amount of transformer capacity installed by service providers is likely to affect our benchmarking results.^{771 772} Advisian considers that the ratcheted peak demand variable will not take into account the spatial element of demand or additional capacity installed for system security.

The ratcheted peak demand variable in Economic Insights' SFA model accounts for the spatial element of demand. This is because it uses non-coincident system demand. As a result service providers that have separated commercial and residential areas will not be disadvantaged in Economic Insights' SFA model.

Advisian also submitted that service providers should be compensated for transformer capacity installed. This is because it must be installed to meet forecast demand.⁷⁷³ Therefore having excess capacity is not necessarily inefficient.

This dilemma faces all service providers. All service providers must install transformer capacity to meet forecast demand. Therefore to the extent that a service provider must invest in excess capacity, this will be captured in ratcheted maximum demand. As a result if a service provider systematically overinvests in excess capacity transformer capacity, this is evidence that service provider's management performs relatively worse in responding to changes in demand conditions. As a result, benchmarking on the basis of installed capacity rather than ratcheted peak demand has the potential to reward inefficient investment.

Backyard reticulation

We are satisfied that it is necessary to provide a positive 5.6 per cent OEF adjustment for ActewAGL's backyard reticulation. Backyard reticulation is beyond the immediate control of ActewAGL, it is likely to lead to an increase in opex relative to other service providers, and it is not accounted for elsewhere in Economic Insights' SFA model.

In our draft decision we provided an OEF adjustment for backyard reticulation for these reasons.

In response to our draft decision, ActewAGL⁷⁷⁴ and ActewAGL's consultant Advisian⁷⁷⁵ raised the issue. ActewAGL stated it was unclear how we made the adjustment. Advisian considered that the AER should provide a \$2 million adjustment (\$2013) OEF

⁷⁷⁰ CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (ActewAGL), 2015, p. iv-5.

⁷⁷¹ Advisian, Review of AER benchmarking: Networks NSW, 16 January 2015, p. 44.

⁷⁷² Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 51 -57.

⁷⁷³ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 51 -57.

⁷⁷⁴ ActewAGL, *Revised Proposal*, 20 January 2015, p. 160.

⁷⁷⁵ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 64-65.

adjustment because the costs associated with backyard reticulation are largely fixed costs.

In our draft decision, we did not provide an adjustment for the backyard reticulation costs actually incurred by ActewAGL. This is because we considered it likely that a similar level of inefficiency existed in those costs as for ActewAGL's total opex. We did not consider it appropriate to including these inefficiencies in our opex forecast. Therefore, we treated the OEF adjustment for backyard reticulation as an increase on the opex forecast by Economic Insights' SFA model that reflected the percentage of ActewAGL's total opex that backyard reticulation accounted for. As a result, the OEF adjustment for backyard reticulation only provided 44 per cent of the opex incurred by ActewAGL for backyard reticulation in financial year 2013.

Backyard reticulation is a network characteristic that is unique to ActewAGL. This means there is limited scope to benchmark these costs against other service providers. Advisian submitted that backyard reticulation costs are largely fixed. We consider that there may be merit to this. Given the information in front of us, we consider it is appropriate to treat backyard reticulation costs as fixed for the calculation of the backyard reticulation OEF adjustment. However, we note this is an issue we may investigate in further detail in the future.

Critical National Infrastructure

We are not satisfied that an OEF for Critical National Infrastructure (CNI) meets the exogeneity OEF adjustment criterion. To the extent that a service provider decides to invest in physical security to a greater extent than other service providers, that is a management decision for the service provider.

In response to our draft decision, Huegin raised CNI as an OEF that may lead to differences in opex.⁷⁷⁶ Huegin noted that Ofgem excludes costs associated with CNI from its totex benchmarking. CNI are electricity distribution sites designated by the UK Department of Energy and Climate Change (DECC).⁷⁷⁷ All sites confirmed by DECC as Category 3 CNI or above are eligible for ex ante funding in accordance with the Physical Security Upgrade Programme.⁷⁷⁸ We note that Huegin has provided no explanation of how this relates to the Australian context.

Ofgem provides an allowance for CNI programs in the UK following guidance from a government agency called The Centre for the Protection of National Infrastructure

⁷⁷⁶ Huegin, *Response to draft determination on behalf of NNSW and ActewAGL - Technical response to the application of benchmarking by the AER*, January 2015, p. 23.

⁷⁷⁷ Ofgem, RIIO-ED1: Glossary of terms, 2014, p. 6.

⁷⁷⁸ Ofgem, RIIO-ED1: Final determinations for the slow-track electricity distribution companies: Business plan expenditure assessment, 28 November, 2014, p. 99-100.

(CPNI)⁷⁷⁹. In Australia CNI projects are undertaken at the discretion of service providers following industry wide guidelines.⁷⁸⁰

Mr Devlin, ActewAGL's General Manager Asset Management, submitted that ActewAGL assets have been classified as critical infrastructure by the Australian Government.⁷⁸¹ Mr Devlin notes that although only some assets have been classified as critical infrastructure ActewAGL takes a consistent approach to security across all of its assets.

ActewAGL also noted that in September 2014 the Prime Minister raised the terror threat level from 'medium' to 'high'. ActewAGL submitted that this had led to an increase in its opex.⁷⁸² It attributed this to deploying additional security resources, tightening access controls, reviewing risk management strategies, and security education programs. ActewAGL did not quantify the costs of these programs. ActewAGL did not explain the regulatory obligation driving the costs. ActewAGL did not explain how these obligations differ from other service providers'. We also note that ActewAGL did not ask for funding for this increase in its revised proposal.

Based on the evidence before us we are not satisfied that ActewAGL's regulatory responsibilities for CNI are greater than other service providers'. As a result, providing an OEF adjustment for CNI does not meet the exogeneity OEF adjustment criterion. To the extent that ActewAGL chooses to invest more in physical security than other service providers, that is a management decision for ActewAGL.

Customer owned distribution transformers

We are not satisfied that an OEF adjustment to account for differences in the amount of transformer capacity owned by customers would meet the materiality OEF criterion. The amount of distribution capacity owned by customers is relatively small, and the distribution transformer maintenance as a percentage of opex is also small. As a result, the maintenance avoided by service providers with customers who own their substations is not considered material.

In some cases, customers take electricity from service providers at higher voltages. In these cases the customer will own and operate transformer equipment to deliver electricity to the voltages they require for their uses. By not having to maintain distribution transformer equipment to service those customers, service providers gain a cost saving when compared against energy and demand throughput.

In response to our draft decision, ActewAGL's consultant Advisian noted that the differences in the amount of distribution transformer capacity owned by customers will lead to differences in service provider's opex.⁷⁸³ Advisian submitted that ActewAGL

⁷⁷⁹ Seconomics, National Grid Requirements, 31 January 2013, p. 40.

⁷⁸⁰ ActewAGL, Regulatory Proposal, June 2008, p. 64.

⁷⁸¹ Stephen Devlin, Witness Statement, 13 February 2015, p.8.

⁷⁸² ActewAGL, Capital and operating expenditure 'site visit' clarifications, 3 October 2014, p. 33.

⁷⁸³ Advisian, Review of AER benchmarking: Networks NSW, 16 January 2015, pp. 41 -49.

would have a cost disadvantage because it has a lower percentage of customer owned distribution transformation equipment connected to its network than other service providers.

Differences in the amount of distribution transformer capacity owned by customers is not likely to lead to material differences in opex between ActewAGL and the comparison firms. These differences may lead to a cost disadvantage of 0.1 per cent for ActewAGL.

Distribution substation maintenance only accounts for on average 2.4 per cent of ActewAGL's network services opex.⁷⁸⁴ ActewAGL owns 98.2 per cent of distribution transformer capacity connected to its network.⁷⁸⁵ The Frontier firms on average, weighted by customer numbers, own 93.9 per cent of distribution transformer capacity.⁷⁸⁶ On this basis ActewAGL's distribution substation maintenance opex may be 5.1 per cent higher than it would be if its customers owned a similar percentage of distribution transformers as the frontier service providers' customers. This is equivalent to a 0.12 per cent cost disadvantage at the total network services opex level. As this represents an increase of 0.12 per cent increase on ActewAGL's historical opex, it must be adjusted to the increase in efficient as described in the calculation of OEFs section above. After this adjustment the customer owned distribution transformers OEF represents an increase in efficient opex of 0.14 per cent.

Following our approach to accounting for immaterial factors we have included differences in the amount of customer owned distribution transformer capacity in our adjustment for immaterial OEFs. An OEF adjustment for differences in customer owned distribution transformer capacity would meet the exogeneity and duplication OEF adjustment criteria. The number of customers that take electricity at high distribution voltages is not determined by service providers and there are no variables in Economic Insights' SFA model to account for it. Given that we are able to estimate the potential cost impact of differences in ownership of distribution transformer capacity, we have used this figure for the relevant contribution to the immaterial factors OEF adjustment.

Demand management

We are not satisfied that an OEF adjustment for differences in the demand management service providers' undertake would meet the duplication OEF criterion. Demand management is a capex opex trade-off. We have considered the impact of capex opex trade-offs under the capitalisation practice OEF.

Demand management is the use of various strategies to change customers' electricity use. By changing energy use, service providers can avoid the need for large

⁷⁸⁴ ActewAGL, Category Analysis RIN responses, template 2.8.

⁷⁸⁵ ActewAGL, Economic Benchmarking RIN response, template 6. Physical assets.

⁷⁸⁶ Economic Benchmarking RIN responses, template 6. Physical assets.

investments in network upgrades to meet a peak demand that only occurs for a small part of the year. In this way service providers can reduce their capex by using opex.

The decision to undertake demand management is a capex opex trade-off. Service providers face many of these trade-offs. Other examples include the choice to rent or buy depots, to run lines over or underground, to replace or maintain. We consider that where a capex opex trade-off exists, the decision on whether to provide an OEF adjustment should be considered in the broader context of service providers' capex to opex ratio. This is because a service provider may utilise a solution that is opex intensive in one area, but overall may have a preference for capital intensive solutions. In this situation providing a positive OEF adjustment for an opex intensive solution would overcompensate the service provider. This is because focusing only on opex capex trade-off OEFs that disadvantage service providers will upwardly bias the total OEF adjustment.

In our capitalisation practices section we compare the capex opex ratios for the NEM service providers. Figure A.13 shows that, after our adjustment for differences in capitalisation practices, ActewAGL expenses a similar amount of its costs to the comparison firms. We have provided an OEF adjustment for ActewAGL to account for this. Therefore, we are satisfied that differences in opex due to demand management in service provider's networks are accounted in our consideration of capitalisation practices.

Line sag

We are not satisfied that an OEF adjustment for line sag would meet the exogeneity OEF criterion. A prudent service provider would design its network to take into account the demand it services and the environment it operates in. Specifically, network businesses design and construct overhead lines so that they are compliant with the statutory obligations under all standard operating conditions.

Overhead electrical lines expand when heated and this results in the “sag” of the line increasing. Line heating is caused by environmental factors and by the delivery of energy through the line.

Ergon Energy raised the point that high loads and temperatures lead to significant conductor sag. As Ergon Energy is obliged to maintain regulatory clearances of all conductors, its opex includes a system of measuring and actively repairing line sag to ensure regulatory compliance.⁷⁸⁷

All NEM service providers use similar line design criteria to account for sag which take into account, among other things, ambient temperature, solar radiation, and wind speed. The extent to which a service provider finds that it has a systemic issue with regard to line sag is a reflection of the quality of its management in applying the line design criteria. As a result an OEF adjustment for line sag would not satisfy the exogeneity OEF adjustment criterion.

⁷⁸⁷ Ergon Energy, AER information request AER Ergon 002, 17 December 2014, p. 14.

Network Accessibility

We are not satisfied that an OEF adjustment for differences in network accessibility would meet the materiality OEF adjustment criterion. We estimate access track maintenance does not contribute a material amount of opex to the comparison firms' opex. ActewAGL has a smaller percentage of its network without standard vehicle access than the comparison firms.

In response to AER questions, Ergon Energy indicated that it considered differences in network accessibility as an OEF that materially affects its costs.⁷⁸⁸ Vegetation management, line maintenance and asset inspections require access to assets. Ergon Energy considers that high rainfall results in significant damage to access tracks due to washouts, vegetation growth and subsidence. When asked, Ergon Energy did not provide evidence of differences in costs in access track maintenance between high and low rainfall areas of its network.⁷⁸⁹ Nonetheless, economic benchmarking RIN data indicates that Ergon Energy has a greater percentage of its network that does not have standard vehicle access than the comparison firms. In 2013/14, 36 per cent of Ergon Energy's network did not have standard vehicle access. In comparison, the weighted average for the comparison firms was only 5 per cent.⁷⁹⁰

Ergon Energy indicated that over the 2010 to 2014 period on average it incurred \$4.9 million (\$2014/15) for access track maintenance at a cost of \$97 per kilometre of network route with non-standard vehicle access.^{791 792}

Using the unit rate for Ergon Energy's access track maintenance, and route line lengths without standard vehicle access, we estimated the percentage of network services opex that the comparison firms expend on access track maintenance. Using these figures we estimate that in 2014, the percentage increase in the comparison firms' network services opex, weighted by customer numbers, due to access track maintenance was 0.15 per cent.

Using the same method for ActewAGL, we estimate that access track maintenance accounts for an increase of 0.03 per cent of ActewAGL's network services opex. This implies that, ActewAGL's historical opex would be 0.1 per cent higher⁷⁹³ if it were required to maintain a similar amount of access track as the comparison firms.

We have included this advantage in our OEF adjustments for immaterial factors. This is because although an OEF for network access does not meet the materiality OEF criterion it meets the exogeneity and duplication criteria. The amount of a service provider's network with non-standard vehicle access is likely to be determined by land

⁷⁸⁸ Ergon Energy, Response to information request AER Ergon 02, 17 December 2014, p. 13.

⁷⁸⁹ Ergon Energy, Response to information request AER Ergon 018(3), 30 January 2015, p. 7.

⁷⁹⁰ Economic Benchmarking RIN responses 2013 and 2014, Template 8. Operating Environment.

⁷⁹¹ Ergon Energy, Response to information request AER Ergon 018(3), 30 January 2015, p. 7.

⁷⁹² Ergon Energy, Economic Benchmarking RIN responses, 2013 and 2014, Template 8. Operating Environment.

⁷⁹³ $0.0012=100.03/100.15-1$.

use that is beyond service providers' control. Also, there are no variables in Economic Insights' SFA model that account for differences in non-standard vehicle access. Therefore network accessibility contributes negative 0.1 per cent to the collective adjustment for individually immaterial factors.

Past ownership

We are not satisfied that an OEF adjustment for past ownership would meet the exogeneity or material OEF adjustment criteria. The AEMC stated that the nature of ownership should not be taken into account as it is endogenous. Managing a fleet of various asset types installed in response to different management, environmental, demand, and technological circumstances is a core business function of electricity network service providers.

In response to our draft decision Essential Energy raised intra-network variability as an issue that would lead to material differences in opex between it and the comparison firms.⁷⁹⁴ It stated that the legacy of being an amalgamation of different service providers with different practices and standards would lead to it having a cost disadvantage relative to the Victorian service providers. Essential Energy provided no practical examples of how these differences would lead to it having a cost disadvantage. It is not clear how Essential considers this will affect costs, but one interpretation is that Essential's precursor organisations may have adopted different technologies, potentially leading to increased complexity in asset management. We note that the other NSW service providers are also the amalgamation of various service providers.⁷⁹⁵ Ausgrid and Endeavour did not raise this as an issue that would materially affect their costs.

The Victorian service providers did not inherit a highly homogenous network derived from one legacy network. Up until privatisation there were 12 municipal service providers,⁷⁹⁶ known as Municipal Electricity Undertakings, operating across the Melbourne area in addition to the State Electricity Commission of Victoria. CitiPower, Jemena, Powercor and United Energy all own assets that were previously owned by one or more of these municipal service providers. Additionally, all of the NEM service providers must manage a variety of different assets installed in response to different circumstances. The optimal choice of asset will depend on the technology available at the time, the demand the asset must serve, and the environment in which the asset is being installed. All service providers will have a variety of different assets installed at different times.

Further Essential Energy has not demonstrated that if its asset base is more heterogeneous, that any such difference in heterogeneity will lead to a material increase in costs.

⁷⁹⁴ Essential Energy, Revised Proposal: Attachment 7.4, p. 25.

⁷⁹⁵ Stewart Smith, Electricity and Privatisation, NSW Parliamentary library research service, 1997, p. 3.

⁷⁹⁶ Victorian Government, Victorian Government Gazette, No 54 1961, 3 July 1961.

Therefore we are not satisfied that differences past ownership between ActewAGL and the Victorian service providers will lead to material differences in opex.

We are also not satisfied that an adjustment for differences in past ownership satisfies the exogeneity OEF adjustment criterion. The nature of ownership of service providers is an endogenous factor.

Proportion of 22kV and 11kV lines

We are not satisfied an OEF adjustment for the proportions of 22kV and 11kV lines in the network would meet the materiality OEF adjustment criterion. Operating a network using a 22 kV high-voltage distribution system rather than an 11kV high-voltage distribution system is unlikely to create material differences in opex between service providers.

The comparison firms include service providers with both 22kV and 11kV network configurations. Powercor and AusNet, and CitiPower and SAPN, represent the two extremes in terms of 11kV and 22kV networks - Powercor and AusNet are predominantly 22kV systems while CitiPower and SAPN have predominantly 11kV systems. If this factor were material to the costs of the service providers, we would expect this to be most apparent when comparing these four service providers. On Economic Insights' MPFP and opex cost function benchmarking AusNet, CitiPower, Powercor and SAPN all perform well. This suggests that this factor is not material to overall performance.

In our draft decision we adopted this approach and included differences in the proportions of 22kV and 11kV lines in our adjustment for immaterial OEFs.

In response to our draft decisions, Advisian made observations already included in the initial regulatory proposals.⁷⁹⁷ However, Advisian provided no new evidence to suggest that differences in high voltage distribution system configuration would lead to material differences in opex.

In accordance with our approach to estimating the combined effect of OEFs that do not meet the materiality OEF adjustment criterion, we have accounted for differences in high voltage distribution systems in our immaterial OEF adjustment. Although it does not satisfy the materiality criterion, an adjustment for the proportions of 22kV and 11kV lines would satisfy the exogeneity and duplication criteria. The technology that was available at the time a network was established is beyond service providers' control. Economic Insights' SFA model does not include any variables that account for the proportion of 11kV and 22kV lines. ActewAGL operates an 11kV high voltage distribution network. The comparison firms mostly operate 22kV high voltage distribution networks. In theory operating a 22kV network would provide a small reduction in opex costs. Therefore differences in high voltage distribution systems contribute 0.5 per cent to the immaterial factor adjustments for ActewAGL.

⁷⁹⁷ Advisian, Review of AER benchmarking: Networks NSW, 16 January 2015, p. 46.

Proportion of wooden poles

We are not satisfied that an OEF adjustment for differences in the proportion of wooden poles in service providers' networks would not meet the duplication OEF criterion. The decision on whether to use wooden, concrete, steel, or fiberglass poles is a trade-off between capex, opex and service levels. We have considered the impact of capex opex trade-offs under the capitalisation practices OEF and service levels under reliability outcomes.

In our draft decision we did not provide an OEF for wooden poles because it would not lead to material differences in opex. This is because ActewAGL has a lower proportion of wooden poles in its network than several of the comparison firms.

In addition to this, we consider that the decision on whether to use wooden, concrete, steel, or fiberglass poles is a capex opex trade-off. This is because higher capital cost poles are generally less opex intensive. For example concrete poles do not require the inspection drillings and anti-fungal treatments that wooden poles do. However concrete poles are more costly to install.

Service providers face many capex/opex trade-offs. Other examples include the choice to rent or lease depots, to run lines over or underground, to replace or maintain. We consider that where a capex opex trade-off exists the decision on whether to provide an OEF adjustment should be considered in the broader context of service providers' capex to opex ratio. This is because a service provider may utilise a solution that is opex intensive in one area, but overall may have a preference for capital intensive solutions. In this situation providing a positive OEF adjustment for an opex intensive solution would overcompensate the service provider. This is because there will be other areas of their operations where it utilises capital intensive solutions but will not receive negative OEF adjustments.

In our capitalisation practices section we compare the capex opex ratios for the NEM service providers. Figure A.13 and Figure A.14 show that ActewAGL tends to expense more costs than it capitalises. This shows that in general it has an overall preference for opex intensive solutions rather than capex solutions. We have already provided an OEF to account for its capitalisation practices.

Therefore, we are not satisfied that differences in opex due to the proportion of wooden poles in service provider's networks are not accounted for in our consideration of capitalisation practices.

Rising lateral mains

We are not satisfied that an OEF adjustment for rising lateral mains would meet the materiality OEF adjustment criterion. Service providers in the NEM are generally not responsible for maintaining mains within apartment complexes.

Rising and lateral mains are three phase mains, or busbars, that run through apartment buildings to which multiple service lines are connected.⁷⁹⁸

In response to our draft decision, Huegin raised rising and lateral mains as an OEF that may lead to differences in opex.⁷⁹⁹ Huegin noted that Ofgem excludes costs associated with rising and lateral mains from its totex benchmarking. In the UK some service providers have a significant amount of mains running throughout apartment complexes.⁸⁰⁰ Ofgem adjusts its totex benchmarking to remove costs associated with those assets.⁸⁰¹ Huegin did not provide any indication of why this may be an issue in the NEM.

We are not satisfied that it is necessary to provide an OEF adjustment for rising and lateral mains. While some service providers in the UK have substantial rising and lateral mains fleets, in general NEM service providers do not run electricity distribution mains through apartment complexes. In NEM jurisdictions, usually the demarcation between the service providers' assets and customers' assets is either at the boundary of the customer's property or on the outside of the customer's building. In some situations, service providers do own mains that run through a customer's premises that supply a substation. However, all NEM service providers have some substations located on customers' premises and there is no indication that this provides a cost disadvantage where it occurs. Aside from mains that supply substations, it is exceedingly unusual for a service provider to own distribution mains within an apartment building.

We are not satisfied that an adjustment for rising and lateral mains satisfies the materiality OEF criterion. In general NEM service providers do not own, and are not responsible for maintaining rising and lateral mains. As a result we estimate that rising lateral mains maintenance will lead to no differences in the opex incurred by NEM service providers.

Solar uptake

An OEF adjustment for differences in solar photovoltaic (PV) installations between ActewAGL and the comparison firms would not satisfy the materiality OEF adjustment criterion. The penetration rate for small scale solar installations is similar for Victoria and the ACT.

⁷⁹⁸ Ofgem, RIIO-ED1: Glossary of terms, 2014, p. 23.

⁷⁹⁹ Huegin, *Response to draft determination on behalf of NNSW and ActewAGL - Technical response to the application of benchmarking by the AER*, January 2015, p. 23.

⁸⁰⁰ SP Energy Networks, *SP Energy Networks 2015-2023 Business Plan: Annex Rising Mains and Laterals Strategy*, March 2014, pp. 3-4.

⁸⁰¹ Huegin, *Response to draft determination on behalf of NNSW and ActewAGL - Technical response to the application of benchmarking by the AER*, January 2015, p. 23.

In response to inquiries from the AER, Energex stated that solar PV had impacted its network field operating costs due to an increase in voltage complaints, investigations and requirement to re-balance the loading on the three phase network.⁸⁰²

We looked to compare the uptake of PV installations in service providers' networks. We compared the number of solar PV installations deemed by the Clean Energy Regulator per customer in each jurisdiction.⁸⁰³ The number of deemed solar installations was greatest in South Australia. SA Power Networks, the sole service provider in South Australia, is one of the comparison firms.

ATable A.10 Deemed PV installations per 100 connections

Deemed small scale solar installations per 100 connections	
ACT	8.7
NSW	8.7
Queensland	20.8
South Australia	21.5
Victoria	9.1

Source: Clean Energy Regulator; AER analysis.

The number of deemed solar installations per customer is roughly the same for Victoria, where most of the comparison firms are located, and the ACT where ActewAGL is located.

Given this, there is not sufficient evidence to conclude that differences in the rate of PV installations between ActewAGL, and the comparison firms, will lead to material differences in opex.

However, as the PV penetration rate is higher in SA and slightly higher in Victoria than in the ACT, it is likely that the comparison firms will have a cost disadvantage relative to ActewAGL due to differences in PV uptake. An adjustment for differences in PV penetration would meet the exogeneity and materiality OEF adjustment criteria. The decision to install PV is a customer's choice and there are no variables to account for differences in PV penetration rates in Economic Insights' SFA model. As a result we have included differences in opex due to solar PV installations as a 0.5 percentage point decrease in our immaterial OEF adjustments for ActewAGL.

Subtransmission

We are not satisfied that an OEF adjustment for differences in subtransmission network configuration between ActewAGL and the comparison firms would meet the

⁸⁰² Energex, Response to information request AER EGX 001 Question A, 17 December 2014, p. 9.

⁸⁰³ Clean Energy Regulator, Small-scale installations by postcode, available at: <http://ret.cleanenergyregulator.gov.au/REC-Registry/Data-reports> [last accessed 31 March 2015].

materiality OEF adjustment criterion. Differences in subtransmission network configuration between ActewAGL and the comparison firms are not likely to lead to material differences in opex.

In our draft decision we did not provide an OEF adjustment for the same reasons.

The transition point between transmission and distribution varies across jurisdictions and within service providers. All service providers take supply from transmission Grid Exit Points (GXPs) across a range of voltages. In some jurisdictions the transition point occurs at a higher voltage. This means that distribution service providers are responsible for the operation, and costs, of more of the electricity supply chain.

In response to our draft decision, this issue was raised by Advisian,⁸⁰⁴⁸⁰⁵ Frontier Economics,⁸⁰⁶ and CEPA⁸⁰⁷. Advisian submitted that we should have considered the effect of differences in undergrounding in our adjustment. Frontier and CEPA considered that the proportion of subtransmission should be used as an environmental variable in Economic Insights' SFA model. Both noted that it is statistically significant and its inclusion reduces the observed difference in efficiency scores between Australian distributors.

Economic Insights does consider that it is appropriate to include subtransmission directly as an operating environment variable in the SFA model⁸⁰⁸ and we agree. Only the NSW, Queensland and ACT service providers report any line lengths over 66 kV in Australia⁸⁰⁹. There is therefore a risk that this variable may pick up other characteristics that are shared by service providers in these states relative to service providers in the other states. Evidence for this is that the coefficients in the CEPA, Frontier Economics, and PEGR models suggests that subtransmission lines are between 9 and 48 times more expensive to operate than distribution lines.⁸¹⁰ This is more than six times higher than the costs reported by Ausgrid in its regulatory accounts for the last 10 years.⁸¹¹

While we consider that including a variable in the SFA model for subtransmission is not appropriate, we consider it may be appropriate to include a post-modelling adjustment. This is because differences in network boundary are exogenous, likely to materially affect service provider's costs, and are not accounted for elsewhere in the SFA model.

In response to Advisian's report we have investigated the effect of undergrounding. We calculated the adjustment using only overhead subtransmission lines. This resulted in an adjustment more favourable for ActewAGL.

⁸⁰⁴ Advisian, Review of AER benchmarking: Networks NSW, 16 January 2015, pp. 46 -49.

⁸⁰⁵ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 52 -55.

⁸⁰⁶ Frontier Economics, Taking account of heterogeneity between networks when conducting economic benchmarking analysis, February 2015, pp. 38-39.

⁸⁰⁷ David Newbery, Cambridge Economic Policy Associates: Expert report, January 2015 p. 18.

⁸⁰⁸ Economic Insights, April 2015, p. vii.

⁸⁰⁹ Four of the 27 included New Zealand DNSPs report very short lengths of line over 66 kV.

⁸¹⁰ Economic Insights, April 2015, p. 49.

⁸¹¹ Energy Australia regulatory accounts financial year 2001 to financial year 2009, Category Analysis data financial year 2009 to 2013.

However, we consider that it is more appropriate to use total subtransmission line length to calculate the adjustment for subtransmission. This is because it is a proxy for the size of the subtransmission network that service providers must operate. This includes switchgear and transformers. Considering only underground subtransmission line length will distort this. Also Economic Insights' SFA model includes a variable to account for differences in the proportion of undergrounding.

Although in our draft decision, we did not include this factor in our adjustment for immaterial OEFs for ActewAGL, we now consider that this is appropriate. There is some evidence to suggest that no adjustment for ActewAGL is required, but other evidence suggests ActewAGL may incur relatively more opex for subtransmission than the comparison firms. ActewAGL has a slightly smaller share of subtransmission in its total network length than the customer weighted average of the comparison firms. Also, Advisian stated it does not consider this is an issue for ActewAGL.⁸¹² However, ActewAGL's subtransmission lines are almost entirely overhead.

Therefore we consider that this may lead to a marginal increase in subtransmission opex for ActewAGL. As a result we have included a positive 0.5 per cent adjustment for ActewAGL in our adjustment for immaterial factors. This is appropriate as although we are not satisfied an OEF adjustment for subtransmission would meet the materiality criterion, it would meet the exogeneity and duplication criterion. The boundary between transmission and distribution networks is the result of historical decisions made by state governments when dividing electricity networks. Differences in subtransmission configurations are not accounted for elsewhere in Economic Insights' SFA model.

SWER

We are not satisfied that an OEF adjustment for the proportion of Single-wire earth-return (SWER) included in a network would meet the exogeneity or duplication OEF adjustment criteria. The proportion of SWER included in a network is a result of past management decisions and it will be correlated with customer density, which is captured in Economic Insights' SFA model.

In response to our draft decision, Advisian,⁸¹³ CEPA,⁸¹⁵ and Synergies⁸¹⁶ raised the point that the cost of operating SWER lines is different to other lines. Advisian and CEPA submitted that SWER is cheaper to operate than other lines. Synergies on the other hand submitted that it is more expensive to operate because it is less reliable, which results in greater network restoration costs.

⁸¹² Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, p. 52.

⁸¹³ Advisian, Opex Cost Drivers: ActewAGL Distribution Electricity (ACT), 16 January 2015, pp. 57-59.

⁸¹⁴ Advisian, Review of AER benchmarking: Networks NSW, 16 January 2015, pp. 50-52.

⁸¹⁵ CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (ActewAGL), 2015, pp. 26, 30, and 68.

⁸¹⁶ Synergies, Concerns over the AER's use of benchmarking as it might apply in its forthcoming draft decision on Ergon, January 2015, p. 26.

SWER is a mature technology that has been available to network service providers for decades. SWER systems are low capital and maintenance cost distribution systems, which have been installed and operated in many rural parts of the world. The high cost of network extension to rural areas, which are often characterized by scattered communities with low load densities, requires the use of low cost options to ensure economic viability. In SWER power distribution networks, the earth itself forms the current return path of the single phase system leading to significant cost savings on conductors, poles and pole top hardware compared to conventional systems. However, challenges exist in SWER with regard to voltage management, reliability, earthing and safety as well as the dependence on earth conductivity to supply consumer loads.

A 2009 study by PB Associates identified SWER as the most cost effective option for the connection of remote customers.⁸¹⁷ This study showed that SWER supplies were less than half the cost of other overhead solutions. This is supported by a World Bank review of SWER undertaken in 2006.⁸¹⁸

An OEF adjustment for SWER does not meet the exogeneity OEF adjustment criterion. Service providers have had the ability to use SWER in low demand low density areas of their networks. SWER has been available for use in Australia since the first half of the 20th century. To the extent that SWER is a cheaper method to distribute electricity, its use or absence, is a reflection of past managerial efficiency or inefficiency.

To the extent that SWER can be used in low density low demand environments, the effect of SWER on opex will be correlated with customer density. As Economic Insights SFA model accounts for customer density, it will also account for the proportion of SWER used by a service provider. As mentioned in our draft decision, in our consideration of customer density, asset complexity will be correlated with customer density. In this case, SWER is a less complex asset designed to serve low loads through a single wire instead of multiple circuits.

Transmission connection point charges

We are not satisfied that an OEF adjustment for transmission connection point charges would meet the duplication OEF adjustment criterion. Transmission connection point charges have been excluded from network services opex: the opex data used in Economic Insights' SFA model.

Transmission connection point charges are charges for electricity transmission services.

⁸¹⁷ Parsons Brinckerhoff, Indicative costs for replacing SWER lines, 28 August 2009, p. iv.

⁸¹⁸ The World Bank, Sub-Saharan Africa: Introducing Low-cost Methods in Electricity Distribution Networks, October 2006, p. xvi.

In response to our draft decision, Huegin raised transmission connection point charges as an OEF that may lead to differences in opex.⁸¹⁹ Huegin noted that Ofgem excludes transmission connection point charges from its totex benchmarking.

Underground services

We are not satisfied that an adjustment for ActewAGL's responsibility for underground service maintenance would meet the materiality OEF adjustment criterion. Differences in maintenance obligations for underground service cables will not lead to material differences in opex between ActewAGL and the comparison firms.

In our draft decision we estimated that the extra opex that ActewAGL may incur to maintain underground services is unlikely to exceed 0.3 per cent of its total opex. This was estimated on the basis of the maintenance costs for overhead mains, overheads services, and underground cables. As this represents an increase of 0.30 per cent increase on ActewAGL's historical opex, it must be adjusted to represent the increase in efficient opex as described in the calculation of OEFs section above. After this adjustment underground services leads to an increase in efficient opex of 0.35 per cent.

However, in accordance with our treatment of immaterial OEFs, we have included underground services in our collective adjustment for individually immaterial factors to the amount quantified above: 0.35 per cent. This is because the maintenance on underground service cables for ActewAGL represents an increase in scope relative to the comparison firms. An adjustment for differences in responsibility for underground services also satisfies the exogeneity and duplication criteria. Responsibility for the maintenance of underground services is determined by legislation and those differences are not accounted for by variables in Economic Insights SFA model.

⁸¹⁹ Huegin, *Response to draft determination on behalf of NNSW and ActewAGL - Technical response to the application of benchmarking by the AER*, January 2015, p. 23.

A.7 The benchmark comparison point and adjustments to base opex

The purpose of any adjustment to base opex is to develop an appropriate starting point from which to build our alternative estimate of forecast opex that we are satisfied will reasonably reflect the opex criteria. We do this using a range of techniques, including benchmarking. If we make an adjustment to base opex, it is not the end of our assessment, merely one stage of it. However, the effect of removing spending from base opex that does not reflect the opex criteria can be significant because service providers rely heavily on total actual opex incurred in the base year in their revised proposals to develop their proposed forecast.

If our analysis indicates that a service provider's base opex is materially inefficient for the purposes of forecasting opex in the coming regulatory control period even after its individual circumstances (such as exogenous factors) are accounted for, it would not be appropriate to use the base opex for the purpose of constructing a forecast that is intended to reflect the opex criteria. If we relied upon unadjusted revealed costs to build a forecast, it would include spending that does not reflect the opex criteria for each year of the new regulatory period.

Accordingly, making an appropriate adjustment to base opex is an important part of our assessment approach in circumstances where we find evidence for material inefficiency in the base year costs. This issue has been the subject of a range of submissions and responses from stakeholders.

This part of our decision is, essentially, about how much of the actual opex of a service provider in the base year does not reasonably reflect the opex criteria when reviewed using the approach we are applying for the 2014–19 regulatory period.

A.7.1 Position

Having considered all the relevant evidence we consider there is material inefficiency in ActewAGL's base year opex. To rely on their revealed expenditure in the base year when developing our alternative forecast would result in an estimate of total forecast opex that would not reasonably reflect the opex criteria. For the purposes of constructing an alternative opex forecast that we think will reasonably reflect the opex criteria, we have adjusted their base opex downwards by an appropriate margin having regard to the RPPs, the opex factors and the NEO.

We disagree with ActewAGL's submissions that advocate we should abandon our benchmarking techniques and the extent to which we rely upon our benchmarking results.⁸²⁰ Therefore, we continue to place significant weight on the results of Economic Insights' preferred model (Cobb Douglas SFA) in estimating necessary reductions in base opex.

⁸²⁰ ActewAGL, Revised Regulatory Proposal, pp. ix-xi.

However, in light of submissions from service providers, we have reconsidered our approach to determining the most appropriate way to make an adjustment.⁸²¹ As we explain in the Guideline, our preference is to rely on revealed expenditure as an appropriate basis for forecasting efficient, prudent and realistic opex when service providers are appropriately responding to the incentive framework. Therefore, rather than adjusting all service providers below the most efficient performer (the frontier) the Guideline approach is to adjust revealed opex when our analysis demonstrates it is *materially* inefficient.⁸²²

We have looked to international regulators' application of benchmarking for guidance on benchmark comparison points. However, while many regulators apply benchmarking, the application differs across regulatory regimes. Rather, when determining the appropriate point at which to make an adjustment to expenditure, they do so having regard to their regulatory framework and the task before them. Similarly, we have decided on the benchmark comparison point (the threshold at which we make an adjustment to base opex) having regard to our regulatory framework and the task before us.

We have decided, on balance, for this decision the appropriate benchmark comparison point is the lowest of the efficiency scores in the top quartile of possible scores rather than the average approach we used in our draft decision. This is equivalent to the efficiency score for the business at the bottom of the upper third (top 33 per cent) of companies in the benchmark sample (represented by AusNet Services). Our approach of using benchmarking as a basis for making adjustments to opex is consistent with Ofgem's approach.⁸²³

This reduces the benchmark comparison point from 0.86 to 0.77. In making this change to our approach, we have carefully considered the submissions we have received, the requirements in the NEL and NER, the Guideline approach and the advice of Economic Insights. The purpose of assessing base opex under the Guideline approach is to identify material inefficiency. We must ensure, therefore, that our comparison point appropriately reflects our satisfaction that a service provider's revealed opex is *materially* inefficient before we reduce it.

This change reduces our estimate of the necessary adjustments to base year opex significantly. However, given this is our first application of economic benchmarking, our view is this application is appropriate for this determination. That is, we have allowed a wide margin between the frontier firm (0.95) and the benchmark comparison point (0.77). Service providers should be aware, however, that as we refine our approach

⁸²¹ For example, ActewAGL, Revised Regulatory Proposal, 2015, pp. 117, 126-129, Ausgrid, RRP, 2015, pp. 139–140.

⁸²² AER, *Expenditure Forecast Assessment Guideline*, November 2013, p. 22.

⁸²³ Noting that Ofgem now assesses total expenditure rather than capex and opex separately. See, for example, Ofgem, RIIO-ED1–Final determinations for the slow-track electricity distribution companies-Overview, 28 November 2014, Chapter 4.

and receive more data, we may reduce the size of that margin when making adjustments to base opex to develop alternative opex forecasts.

Applying this approach, we have decided to adjust ActewAGL's revealed expenditure by \$22.1 million (32.9 per cent). Table A.11 shows the resulting adjustments. The adjustments incorporate:

- a reduced benchmark comparison point of 0.77 in Economic Insights' SFA model
- an allowance for exogenous circumstances of 23 per cent for ActewAGL based on our detailed assessment set out in section A.6.

These adjustments are consistent with the approach we have outlined in the Guideline and allow us to develop a forecast that best reflects the opex criteria in the NER to achieve the NEO.⁸²⁴

As a result of this modification to our approach from the draft decision, our final decision adjustment is lower than that put forward in our draft decision.

Table A.11 Final decision base opex adjustments

	ActewAGL
Proposed base opex, nominal	95.4
debt raising costs, nominal	0.0
Jurisdictional schemes	-22.0
New CAM, nominal	-6.9
New service classification, nominal	-2.0
Adjusted total opex, nominal	64.5
Base opex, real 2013–14 (end of year)	67.2
Substitute base, real 2013–14 (end of year)	45.1
Difference in base opex	22.1
Percentage base opex reduction	32.8%

Source: AER analysis.

⁸²⁴ AEMC, Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, pp 10.

A.7.2 Draft position

In our draft decision, we assessed ActewAGL's base opex. We noted that ActewAGL used its actual incurred opex incurred in 2012–13 as the base for forecasting its opex for the 2014–19 period. ActewAGL's forecast opex was, therefore, heavily reliant on this actual opex figure in its proposal.

Applying the approach outlined in the Guideline, we analysed ActewAGL's actual opex. We used techniques including a variety of benchmarking models, partial productivity indicators, category analysis and detailed review. These techniques consistently revealed that ActewAGL's actual opex used to devise the forecast opex in its proposal was not comparable with the benchmark opex of an efficient service provider. Accordingly, relying on this as a starting point without adjustment would not generate an opex forecast that reasonably reflects the opex criteria.

To quantify an appropriate adjustment to base opex in the context of this evidence, we used the same techniques that we used to assess ActewAGL's actual opex.

A.7.3 Revised proposal and submissions

In their revised proposals, ActewAGL and the NSW service providers submitted common issues regarding how we make adjustments to base year opex. We have carefully considered these submissions as part of our decision on the appropriate benchmark comparison point and the adjustment process.

The appropriate benchmark comparison point

In their revised proposals, the ACT and NSW service providers submitted that our approach to adjustments is different to that of other regulators.⁸²⁵ ActewAGL contends, for example, that we have erred by placing reliance on a single benchmarking model as different benchmarking approaches imply differing base year opex adjustments.⁸²⁶ ActewAGL and its consultants also submit that:⁸²⁷

- our efficiency gap is large and inconsistent with international precedent
- our application of benchmarking results is inconsistent with international practice and literature
- our target is not appropriately cautious when compared to Economic Insights' previous views as expressed in publications.

⁸²⁵ ActewAGL, Revised Regulatory Proposal, 2015, pp. 117, 126-129, Ausgrid, RRP, 2015, pp. 139–140.

⁸²⁶ ActewAGL, Revised Regulatory Proposal, 2015, p. 118.

⁸²⁷ ActewAGL, Revised Regulatory Proposal, pp. 168-173; CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (ActewAGL), 2015, p. 134.

The service providers have also submitted that, by using average efficiency scores as the basis for our adjustment, we have used a 'false frontier'⁸²⁸ and, additionally, that our roll forward approach has been applied incorrectly.⁸²⁹

In light of submissions, we have reconsidered our approach to making an adjustment and we have modified it appropriately for this final decision. This involves consideration of the appropriate technique, the benchmark comparison point and the appropriate application of our technique.

The best technique for the adjustment

Consistent with our draft decision approach, we continue to adopt Economic Insights' recommendation to rely on the Cobb Douglas SFA model as the preferred technique upon which we base an adjustment to revealed opex. Our rationale for this is SFA is the most statistically superior method because it directly estimates efficiency, separate from the error term.⁸³⁰ We provide more detail on Economic Insights' preference to use SFA in section A.4.

The benchmark comparison point

In this final decision, we have reconsidered the appropriate benchmark comparison point following submissions on our approach. In doing so, two questions are relevant:

- should the benchmark comparison point be the best performing business?
- if not, what is the appropriate point at which we are satisfied there is evidence of material inefficiency in the base opex?

Should we use the best performing business as our comparison point?

We explain in the Guideline that our preference is to rely on revealed expenditure as an appropriate basis for forecasting efficient, prudent and realistic opex when service providers are appropriately responding to the incentive framework. Therefore, we created a threshold in the Guideline—we would adjust revealed opex when our analysis demonstrates it is *materially* inefficient.⁸³¹

The first opex criterion (efficient costs) suggests that the most appropriate benchmark comparison point may be the top performing business because economic theory would not consider a lower point to be efficient. The theoretical comparison point is therefore 0.95. However, the NER also contain the qualifier 'reasonably reflects'.⁸³² This provides

⁸²⁸ Ausgrid, Revised Regulatory Proposal, pp. 143-144; ActewAGL Revised Regulatory Proposal, pp. 166-175.

⁸²⁹ ActewAGL Revised Regulatory Proposal, p. 166; Frontier Economics, (NSW/ACT), 2015, p.97, PEGR, 2015, p.64. CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, p.35.

⁸³⁰ Economic Insights (2014), section 5.

⁸³¹ AER, *Expenditure Forecast Assessment Guideline*, November 2013, p. 22.

⁸³² NER, clause 6.5.6(c) states:

The AER must accept the forecast of required operating expenditure of a Distribution Network Service Provider that is included in a building block proposal if the AER is satisfied that the total of the forecast operating

us with discretion to determine how far from the frontier a service provider must be before we are satisfied, in accordance with the Guideline approach, that it is 'materially inefficient'.

In determining what is 'materially inefficient', we recognise that there should be an appropriate margin for forecasting error, data error and modelling issues. Our view is, therefore, that using this discretion it is appropriate to choose a lower comparison point than the frontier firm.

In our draft decision, we adopted this approach. On Economic Insights' recommendation, we used the weighted average efficiency scores of all service providers with efficiency scores greater than 0.75 as the benchmark comparison point.⁸³³ This enabled us to incorporate a margin for potential data and modelling issues, and resulted in a comparison point of 0.86. However, submissions by the service providers and their consultants consider our draft decision approach was inconsistent with approaches taken by other regulators such as Ofgem, Norway, the NZCC (New Zealand Commerce Commission) and the OEB (Ontario Energy Board).⁸³⁴

What is the appropriate benchmark comparison point?

Having considered the service providers' submissions, we turned our mind to how international regulators have applied benchmarking. However, we have found that no uniform approach exists. International regulators use benchmarking to, for example:⁸³⁵

- assess efficient opex (UK, Ireland)
- determine industry-wide productivity growth (NZ, Germany)
- group service providers and assign group-specific stretch factor as part of the X factor (Ontario, NZ, Japan)
- apply model results directly to allowed revenue/price formula (Netherlands, Austria, Germany, Denmark, Finland, Norway)
- Form basis of negotiation (California).

In terms of setting the benchmark comparison point:⁸³⁶

- the NVE in Norway, where the regulatory regime is to set total cost, uses an industry average firm

*expenditure for the regulatory control period **reasonably reflects** each of the following (the operating expenditure criteria):*

*(1) **the efficient costs** of achieving the operating expenditure objectives...*

⁸³³ Economic Insights (2014), section 7.

⁸³⁴ Ausgrid, pp. 150-151, Attachments 1.05 and 1.07.

⁸³⁵ ACCC/AER (2012), Benchmarking Opex and Capex in Energy Networks, ACCC/AER Working Paper number 6, May.

⁸³⁶ ACCC/AER (2012), Benchmarking Opex and Capex in Energy Networks, ACCC/AER Working Paper number 6, May.

- the EMA in Finland uses a firm-specific target (based on an average of DEA and SFA results) to determine efficient opex
- the OEB in Canada has previously used firm-specific stretch factors assigned to three cohorts (0.2% top quartile, 0.4% middle two quartiles and 0.6% bottom quartile) to set efficient opex
- the NZCC in New Zealand, where the regime is based on total cost, determines industry-wide productivity growth to determine the X factor
- Ofgem in the UK has weighted three models together and set the frontier (based on the upper quartile company) after they have been combined.⁸³⁷

Therefore, regulators choose benchmark comparison points on the basis of the task in hand in the context of the legislative frameworks under which they operate. The comfort we can take from this is that the most appropriate approach is to determine a benchmark comparison point in accordance with our regulatory framework.

We have decided, on balance, for this decision, that the appropriate benchmark comparison point is the lowest of the efficiency scores in the top quartile of possible scores rather than the average approach we used in our draft decision. This is equivalent to the efficiency score for the business at the bottom of the upper third (top 33 per cent) of companies in the benchmark sample (represented by AusNet Services). Our revised comparison point is appropriate for the following reasons.

First, our draft decision averaging approach produced an unusual result for service providers ranked in the top quartile of efficiency scores, but below the average of that top quartile. These service providers would require an efficiency adjustment to reach the average benchmark comparison point (because their scores are below the average) despite being efficient enough to be ranked in the top quartile and, hence, included in the average.

Second, given it is our first application of benchmarking, it is appropriate to adopt a cautious approach. We have decided to increase the margin for error for modelling and data issues provided for in the draft decision (which reduced the benchmark comparison point from 0.95 to 0.86).

Third, we consider this approach better achieves the NEO and RPPs. In particular we have considered:⁸³⁸

- the principle that we should provide service providers with an opportunity to recover at least their efficient costs
- we wish to create a high-powered efficiency incentive (which supports making an adjustment when it is clear there is material inefficiency in revealed costs) but we are mindful of providing sufficient stability to promote efficient investment

⁸³⁷ CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, pp. 30-31.

⁸³⁸ NEL, section 7A.

- our decision should allow a return that is commensurate with both regulatory and commercial risks.

A number of service providers, representing more than a third of the NEM, and operating in varied environments, are able to perform at or above our benchmark comparison point. We are confident that a firm that performs below this level is, therefore, spending in a manner that does not reasonably reflect the opex criteria. An adjustment back to an appropriate threshold is sufficient to remove the material over-expenditure in the revealed costs while still incorporating an appropriately wide margin for potential modelling and data errors and other uncertainties. Economic Insights agrees that this approach is appropriate.⁸³⁹

Our approach of using benchmarking as a basis for making adjustments to opex is also consistent with Ofgem's approach.⁸⁴⁰

This approach results in a comparison point significantly lower than the frontier firm's efficiency. Reducing the efficiency target from 0.95 (CitiPower) to 0.86 represented a 9 percentage point allowance for the service providers. Changing the target to 0.77 (AusNet Services) increases that reduction by a further 10 per cent. Overall, this is a 19 percentage point reduction from the frontier firm under the SFA model.

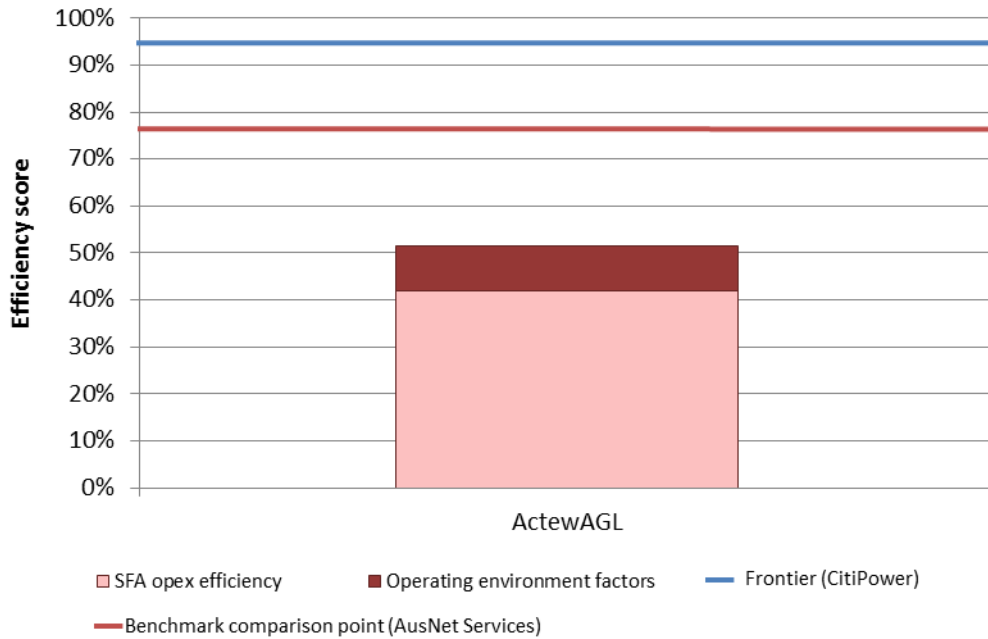
Figure A.27 below shows the efficiency score for ActewAGL compared to our benchmark comparison point, represented by the red line (AusNet Services). The blue line represents the frontier firm (CitiPower).

Our operating environment factor adjustment is a percentage adjustment relative to the frontier. Therefore, the operating environment factor adjustment in Figure A.27 will not reflect the absolute percentage reported above. That is, the dark red proportion represents 23 per cent of ActewAGL's total efficiency score rather than an addition of 23 percentage points on top of the SFA opex efficiency score.

⁸³⁹ Economic Insights (2015), section 5.1.

⁸⁴⁰ Noting that Ofgem now assesses total expenditure rather than capex and opex separately. See, for example, Ofgem, RIIO-ED1—Final determinations for the slow-track electricity distribution companies—Overview, 28 November 2014, Chapter 4.

Figure A.27 Comparison of raw SFA efficiency scores to the benchmark comparison point, adjusted for operating environment circumstances



Source: AER analysis.

Note: The raw SFA efficiency scores displayed are 'rolled forward' from a period-average basis (for 2006-2013) to the 2012–13 base year. We explain this below in our discussion of the adjustment process.

Figure A.27 demonstrates an appropriately conservative difference between the frontier firm and our benchmark comparison point.

As we refine our approach and continue to receive more data—all service providers must submit data each year— we may revise our benchmark comparison point when making adjustments to base opex to develop alternative opex forecasts.

The adjustment process

The mechanics of determining the adjustment include several steps. In essence, it involves using the SFA model to estimate average period efficiency, which we adjust to take into account the reduced the benchmark comparison point and operating environment factor allowances. We then roll this average period efficient opex forward to the 2012–13 base year to compare efficient base opex to the service provider's reported base opex.⁸⁴¹

⁸⁴¹ We use the standard control services opex as reported in the service provider's regulatory accounts.

The service providers submit that both using an average approach and rolling it forward are inappropriate.⁸⁴² Here, we clarify why we consider our approach is appropriate.

Average period efficiency scores

A key reason we use average period efficiency scores is because they moderate the impact of year-specific fluctuations not under the control of the service provider (such as weather conditions) while also reducing the scope for the service provider to strategically reduce its reported opex in a single, nominated benchmark year.⁸⁴³

Average efficiency results also provide us with a better estimate of underlying recurrent expenditure not influenced by year on year changes, which we require for the Guideline approach to estimating total forecast opex.

In addition, because the sample period is the eight years from 2006 to 2013, Economic Insights considers the average is sufficiently recent to avoid the potential loss of current relevance.⁸⁴⁴ Economic Insights also considers the performance gap between ActewAGL and the Victorian service providers has not narrowed for the following reasons.⁸⁴⁵

- the Victorian service providers experienced a negative rate of technical change (which leads to a negative rate of opex partial productivity growth) due to allowed step changes following the implementation of Victorian Bushfires Royal Commission recommendations
- the SFA and LSE models calculate average efficiency levels over the period and these averages incorporate the influence of the situation at the end of the period. That is, they calculate average efficiency for the period rather than midpoint efficiency. Therefore, because the efficiency score is an average, it already partially allows for changed conditions at the end of the period (assuming they have in fact changed).

Rolling forward average scores to the base year

Because we compare average efficiency, we must 'roll forward' the average efficient opex to the 2012–13 base year, because that is the relevant starting point for estimating total forecast opex that reasonably reflects the opex criteria. We do this by applying the measured rate of change, which accounts for the difference between output, price and productivity in the 2012–13 base year and at the period average

⁸⁴² Ausgrid, Revised Regulatory Proposal, pp. 143-144; ActewAGL Revised Regulatory Proposal, pp. 166-175; Frontier Economics, (NSW/ACT), 2015, p.97, PEGR, 2015, p.64. CEPA, Benchmarking and setting efficiency targets for the Australian DNSPs, (NSW DNSPs), 2015, p.35.

⁸⁴³ Economic Insights (2015), section 4.1.

⁸⁴⁴ Economic Insights (2015), section 4.1.

⁸⁴⁵ Economic Insights (2015), section 4.3.

(2006 to 2013).⁸⁴⁶ The rate of change value varies for each service provider due to differing growth rates.

Rolling forward average efficiency to the 2012–13 base year allows for differences in service providers' relative opex growth rates between the average and the base year. This means that if a service provider has increased its constant price opex between the average of the period and 2012–13 by less than that which the rate of change formula allows, it would receive a smaller base year opex reduction compared to that implied by its average efficiency score.

Conversely, if the service provider has increased its constant price opex by more than that which the rate of change formula allows, it would receive a larger base year opex reduction compared to that implied by its average efficiency score.⁸⁴⁷

Final decision adjustment

Table A.12 demonstrates the steps involved in making the adjustment to ActewAGL's base year opex.

Table A.12 Steps for making the adjustment to ActewAGL's base opex

	Description	Output	Calculation
Step 1 – Start with ActewAGL's average opex over the 2006 to 2013 period	ActewAGL's network services opex was, on average, \$59.9 million (\$2013) over the 2006 to 2013 period.	\$59.9 million (\$2013)	
Step 2 —Calculate the raw efficiency scores using our preferred economic benchmarking model	Our preferred economic benchmarking model is Economic Insights' Cobb Douglas SFA model. We use it to determine all service providers' raw efficiency scores. Based on ActewAGL's customer numbers, line length, and ratcheted maximum demand over the 2006 to 2013 period, ActewAGL's raw efficiency score is 39.9 per cent.	39.9 per cent ⁸⁴⁸	
Step 3—Choose the comparison point	For the purposes of determining our alternative estimate of base opex, we did not base our estimate on the efficient opex estimated by the model. The comparison point we used was the lowest of the efficiency scores in the top quartile of possible	76.8 per cent ⁸⁴⁹	

⁸⁴⁶ This differs slightly from the rate of change we apply in Appendix B. While the approach is the same, to trend base opex forward over the forecast period, we apply forecast growth. When rolling forward average efficient opex, we apply measured growth because we can observe what has actually changed between the period average and the base year.

⁸⁴⁷ Economic Insights (2015), section 4.2.

⁸⁴⁸ Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and ACT Electricity DNSPs*, November 2014, p. 37.

⁸⁴⁹ Economic Insights, *Economic Benchmarking Assessment of Operating Expenditure for NSW and ACT Electricity DNSPs*, November 2014, p. 37.

	Description	Output	Calculation
	<p>scores (represented by AusNet Services). According to this model AusNet Services' opex is 76.8 per cent efficient based on its performance over the 2006 to 2013 period. Therefore to determine our substitute base we have assumed a prudent and efficient ActewAGL would be operating at an equivalent level of efficiency to AusNet Services.</p>		
Step 3— Adjust ActewAGL's raw efficiency score for operating environment factors	<p>The economic benchmarking model does not capture all operating environment factors likely to affect opex incurred by a prudent and efficient ActewAGL.</p> <p>We have estimated the effect of these factors and made a further adjustment to our estimate where required. We have determined a 23.0 per cent reduction to ActewAGL's comparison score based on our assessment of these factors.</p> <p>Material operating environment factors we considered were not accounted for in the model include ActewAGL's responsibility for backyard reticulation, its different capitalisation practices, and its approach of allocating connections expenditure to standard control services opex.</p>	62.4 per cent	$= 0.768 / (1 + 0.230)$
Step 4—Calculate the percentage reduction in opex	We then calculate the opex reduction by comparing ActewAGL's efficiency score with the adjusted comparison point score.	36.2 per cent	$= 1 - (0.399 / 0.624)$
Step 5—Calculate the midpoint efficient opex	<p>We estimate efficient opex at the midpoint of the 2006 to 2013 period by applying the percentage reduction in opex to ActewAGL's average opex over the period.</p> <p>This represents our estimate of efficient opex at the midpoint of the 2006 to 2013 period.</p>	38.2 million (\$2013)	$= (1 - 0.362) * 59.9$ million
Step 6— Trend midpoint efficient opex forward to 2012–13	<p>Our forecasting approach is to use a 2012–13 base year. We have trended the midpoint efficient opex forward to a 2012–13 base year based on Economic Insights' opex partial factor productivity growth model. It estimates the growth in efficient opex based on growth in customer numbers, line length, ratcheted maximum demand and share of undergrounding.</p> <p>It estimated the growth in efficient opex based on ActewAGL's growth in these inputs in this period to be 13.26 per cent.</p>	43.3 million (\$2013)	$= 38.2 \times (1 + 0.1326)$
Step 7—Adjust the midpoint efficient opex for CPI	The output in step 6 is in real 2013 dollars. We need to convert it to real 2013–14 dollars for the purposes of forming our substitute estimate of base opex. This reflects one and a half years of inflation. This is our estimate of base opex.	45.1 million (\$2013–14)	$= 43.3 \times (1 + 0.042)$

B Rate of change

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

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

As set out in our Guideline, we have developed an opex forecast incorporating the rate of change to account for the following factors.⁸⁵⁰

- price growth
- output growth
- productivity growth.

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

B.1 Position

We have applied the same rate of change methodology to derive our alternative estimate of opex as we used for our draft decision. Table B.1 shows our final position on each rate of change component and the overall rate of change in annual percentage terms. We consider that applying our methodology to derive an alternative estimate of opex will result in a forecast that reasonably reflects the efficient and prudent costs faced by ActewAGL given a realistic expectation of demand forecasts and costs inputs.

Table B.1 Rate of change (per cent)

	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
Price growth	0.20	0.40	0.47	0.70	0.76	0.76
Output growth	-0.04	-0.04	1.05	1.06	1.05	1.05
Productivity growth	-	-	-	-	-	-
Overall	0.15	0.35	1.53	1.76	1.82	1.81

Source: AER analysis.

⁸⁵⁰ AER. *Better Regulation explanatory statement expenditure forecast assessment guideline*, November 2013, p. 61.

B.2 Draft position

In our draft decision, we did not adopt ActewAGL's forecast growth in price and output in our forecast rate of change and thus our alternative estimate of opex. Our rate of change was on average 0.66 per cent higher than ActewAGL's.

We considered the main driver of the difference between the rate of change forecasts was output growth. We did not consider ActewAGL linking its output growth to its capex was reasonable. This is because capex is an input rather than an output. Therefore we adopted Economic Insight's output specification based on its economic benchmarking. The outputs in our output specification reflect the services that customers require. Our forecast of output growth was on average 0.82 percentage points higher than ActewAGL's due to ActewAGL offsetting much of its output growth with economies of scale.

To forecast price growth we adopted an average of ActewAGL's consultant Independent Economics and our consultant Deloitte Access Economics' (DAE) forecasts. We noted Independent Economics forecasts were similar to BIS Shrapnel's, who in the past we have found to forecast too high. We have previously found DAE's forecasts to be too low so we considered an average best reflects the labour price growth. Our forecast price growth was on average 0.16 percentage points lower than ActewAGL's.

Like ActewAGL, we applied forecast productivity of zero.

Refer to section B.4 of attachment 7 in our draft decision for a detailed explanation of our assessment methodology and how we applied the rate of change.

B.3 Revised proposal and submissions

ActewAGL's revised proposal raised concerns with our approach to setting the forecast price growth. ActewAGL did not consider our forecast output growth and productivity growth, which was based on the econometric cost function, to reasonably reflect the efficient costs a prudent operator would incur to achieve the opex objectives.⁸⁵¹

We discuss each of the issues raised in response to our draft decision below.

B.3.1 Price growth

We consider our price growth takes account of the likely ongoing changes to opex that reflects the opex criteria over the forecast regulatory control period. We have also amended our rate of change to include the rate of change for 2013–14 in response to ActewAGL's revised proposal.

ActewAGL raised the follow criticisms of our price growth approach:

⁸⁵¹ ActewAGL Revised proposal, 20 January 2015, p. 215.

- We did not allow for price growth in the year between the base year and the first year of the 2014–19 period.⁸⁵²
- Like our consultant, DAE, Independent Economics previously under forecast labour, under the trading name KPMG Econtech, so it would not be reasonable to average both labour forecasts.⁸⁵³
- We did not provide any basis or evidence to support our opex price weightings.⁸⁵⁴

We discuss each of these issues in the sections below.

Our estimate of the rate of change for 2013–14

We have amended our alternative opex forecast to apply the rate of change to 2013–14 because we will not apply the EBSS for the 2014–19 period.

ActewAGL noted that our opex model failed to allow for price growth in 2013–14. ActewAGL considered this understated the opex allowance for all years in the forecast period and for the forecast to accurately reflect real price growth, it should account for cumulative growth from the base year.⁸⁵⁵

Our opex model does account for price growth in 2013–14. As outlined in our Guideline, we apply the forecast rate of change to our estimate of final year opex. Consequently the rate of change only captures price growth from the final year (that is 2013–14). However, our Guideline approach to estimating estimate of final year opex does account for price growth.

As set out in our Guideline, we estimate final year opex as the determined opex allowance for the final year minus the cumulative efficiency gain made up to the base year (which is the underspend in that year). In other words, we take the reported opex in the base year and add the difference between the opex allowance for the final year and the allowance for the base year. This will include price growth included in the allowance for 2013–14.

Thus the opex forecast assumes the distributor makes no efficiency gains after the base year. This allows the distributor to retain the efficiency gains it makes in the final year for five years through the opex forecast.⁸⁵⁶ However, because we have not applied the EBSS penalty accrued by ActewAGL in the 2009–14 period, and the EBSS will not apply in the 2014–19 period, there is no need to estimate final year opex this way. Consequently we have adjusted our opex model to apply the forecast rate of change from the base year (that is 2012–13) not the final year.

⁸⁵² ActewAGL, Revised proposal, 20 January 2015, p. 209.

⁸⁵³ ActewAGL, Revised proposal, 20 January 2015, p. 210.

⁸⁵⁴ ActewAGL, Revised proposal, 20 January 2015, p. 211.

⁸⁵⁵ ActewAGL, Revised proposal, 20 January 2015, p. 209.

⁸⁵⁶ AER, *Better regulation expenditure forecast assessment guidelines for electricity distribution*, November 2013, pp. 22–23.

Averaging labour forecasts

We have maintained our draft decision approach to average Deloitte Access Economics (DAE) and Independent Economics' labour forecasts for labour price growth. We consider an average of these two consultant's forecasts represents the best labour forecast available for the ACT.

ActewAGL noted that we were incorrect in stating that we were unable to assess the past accuracy of Independent Economics forecasts as it had not provided labour forecasts in past decisions. ActewAGL noted that we engaged KPMG Econtech, who subsequently adopted the trading name Independent Economics, in 2008 to forecast labour for ActewAGL's 2009–14 distribution determination.

ActewAGL further noted that both Econtech and DAE underforecast wage growth so the best expectation of the labour price would be to apply the higher of the two forecasts.⁸⁵⁷

We consider the models developed by Econtech for the 2009–14 distribution determination are not the same models that Independent Economics applied to forecast ACT wage growth for the 2014–19 period. We note Independent Economics' report stated that it forecast using a new labour cost model developed specifically for this project.⁸⁵⁸ We also note that Independent Economics developed other new forecasting models after it adopted its new trading name.⁸⁵⁹

We cannot assess the past forecasting accuracy of these new models, but analysis from our draft decision shows that Independent Economics' new labour forecast model produces forecasts similar to BIS Shrapnel which has a history of overforecasting wage growth.⁸⁶⁰

Therefore, we consider an average of DAE and Independent Economics labour forecast to be the best forecast of wage growth for the ACT electricity, gas, water and waste services (EGWWS) sector.

Input price weights

We consider our input price weights represent the benchmark labour and non-labour weights for an efficient distributor.

ActewAGL considered that we did not provide any basis for, or evidence to support the adoption of our opex price weightings.⁸⁶¹ ActewAGL further noted that elsewhere in our draft decision we referred to an 80 per cent labour weighting.

⁸⁵⁷ ActewAGL, Revised proposal, 20 January 2015, p. 211.

⁸⁵⁸ Independent Economics, Labour cost escalators for NSW, the ACT and Tasmania, 18 February 2014, p. 8.

⁸⁵⁹ <http://www.independenteconomics.com.au/Models.aspx> accessed 6 March 2015.

⁸⁶⁰ AER, ActewAGL draft decision attachment 7: operating expenditure, November 2014, p. 200.

⁸⁶¹ ActewAGL, Revised proposal, 20 January 2015, p. 211.

ActewAGL considered that since we did not disclose the basis for our opex price weightings in our draft decision, we have denied ActewAGL the opportunity to respond to our draft decision on those weightings. ActewAGL also considered that we should provide it with a reasonable opportunity to make submissions on those weightings to accord with procedural fairness.⁸⁶² In our view, the opportunity to comment on our draft decision itself provides procedural fairness to ActewAGL. We note also that we developed the weightings during the preparation of our Guidelines. We engaged in an extensive consultation process over many months when developing the Guidelines and ActewAGL was invited to participate in that process.

We first flagged the use of these weightings in the Guideline working group on 20 March 2013. We invited stakeholders to comment on Economic Insights' briefing note which outlined proposed opex price weightings.⁸⁶³ We also noted in our Guidelines that we intended to apply a 'rate of change' approach in assessing opex and that we intended to apply Economic Insights' recommendation for the same opex price weightings approach.⁸⁶⁴

We note the 80 per cent labour weighting referred to in our draft decision relates to ActewAGL's proportion of labour rather than the benchmark proportion for an efficient distributor.⁸⁶⁵ This 80 per cent figure does not relate to our opex price weightings because we apply benchmarking weightings.

In our draft decision we note that we applied a 62 per cent weighting for EGWWS labour and 38 per cent for non-labour. The non-labour portion relates to producer price indexes (PPIs) for business, computing, secretarial, legal and accounting and public relations services.⁸⁶⁶ We considered these weightings represented the benchmark proportion of labour and non-labour opex.

Economic Insights outlined the methodology for determining these weightings in its report for our draft decision. In its report, Economic Insights noted that it has previously applied these weightings in 2012 and they are opex shares based on analysis by Pacific Economics Group (PEG) in 2004. PEG calculated these shares by analysing Victorian electricity distributors' regulatory accounts data.⁸⁶⁷ We have therefore clearly identified the basis for these weightings and how we use it in our approach to expenditure assessment.

Moreover, throughout both the Guidelines and reset process, ActewAGL has had several opportunities to respond to our proposed opex price weightings.

⁸⁶² ActewAGL, Revised proposal, 20 January 2015, p. 211–212.

⁸⁶³ Economic Insights, *Inputs to be used in the economic benchmarking of electricity network service providers*, 27 February 2013, p. 10.

⁸⁶⁴ Economic Insights, *Economic Benchmarking of electricity network service providers*, 25 June 2013, p. 68.

⁸⁶⁵ AER, ActewAGL draft decision attachment 7: operating expenditure, November 2014, p. 46.

⁸⁶⁶ AER, ActewAGL draft decision attachment 7: operating expenditure, November 2014, p. 195.

⁸⁶⁷ Economic Insights, *Economic benchmarking assessment of operating expenditure for NSW and ACT electricity DNSPs*, 17 November 2014, p. 14.

AusNet Services submitted that the labour and non-labour proportions should reflect a distributors' actual opex unless there is evidence that the firm is not responding to incentives.⁸⁶⁸

We note AusNet Services submission does not apply to ActewAGL's opex weightings as ActewAGL is not on the efficient frontier. Further, we consider price weightings should reflect benchmark proportions and provides more incentives to distributors to beat the benchmark compared to actual costs.

B.3.2 Output growth and productivity

We consider our methodology for setting output growth and productivity growth to represent the best forecast of the rate of change components for an efficient service provider.

In its revised proposal ActewAGL detailed several concerns relating to Economic Insights' econometric modelling. Since our output growth and productivity growth is based on Economic Insights' analysis, ActewAGL did not consider our output growth and productivity methodology to reasonably reflect the opex objectives.⁸⁶⁹

We have considered ActewAGL's criticisms of our economic benchmarking approach in our base opex assessment in appendix A. We note ActewAGL did not raise any other issues regarding our output growth and productivity growth. As discussed in appendix A, our economic benchmarking and output specification is robust for the following reasons:

- The output specification reflects the services a distributor's customers require.
- These outputs are consistent with other model specifications in the benchmarking literature.

Economic Insights undertook rigorous econometric modelling to estimate opex cost function that relates opex with outputs and other relevant cost drivers. Since we consider our economic benchmarking analysis to be robust we consider the approach we adopted to setting output growth and productivity in our draft decision to be reasonable. We adopt the same output specification in the rate of change as opex modelling to setting base opex because both our historical and forecast assessment should be consistent and output growth should account for the change in the distributor's key functional outputs valued by customers.

ActewAGL's forecast output change is driven by its forecast capital expenditure. As new assets are commissioned the number of assets will increase. ActewAGL forecasted higher maintenance costs commensurate with its increased asset base.⁸⁷⁰

⁸⁶⁸ AusNet Services, *Draft decisions NSW/ACT electricity distribution determination 2015–19*, 12 February 2015, p. 7.

⁸⁶⁹ ActewAGL, *Revised proposal*, 20 January 2015, p. 215.

⁸⁷⁰ ActewAGL, *Regulatory proposal 2015–19 Subsequent regulatory control period*, 10 July 2014, p. 233.

We consider the direct change in a distributor's output better reflects its output growth than capex. This is because the relationship between capex and opex is subjective and it is better to use the actual observed relationship between the change in the output and opex. Further, price changes may influence capex because it is an input.

In its revised proposal ActewAGL reiterated that it had used an implicit productivity improvement by assuming forecast increases in its asset base is offset by increases in productivity to maintain a stable operating cost profile.⁸⁷¹

We note the first step of building our alternative estimate of total forecast opex is to determine a base opex that reflects the opex criteria as our starting point. We then apply the rate of change to our base opex to account for changes over time.⁸⁷²

Since we do not consider ActewAGL's base year opex reflects the opex criteria, it is not reasonable to apply ActewAGL's forecast productivity in our alternative opex forecast. This is because ActewAGL has forecast its productivity relative to its own base year. If this base year does not reflect the opex criteria, there is more potential for productivity gains than otherwise.

Since we have already adjusted ActewAGL's base year opex to reflect the opex criteria then our productivity forecast should not include any 'catch up' productivity.

⁸⁷¹ ActewAGL, Revised proposal, 20 January 2015, p. 214.

⁸⁷² AER, ActewAGL draft decision attachment 7: operating expenditure, November 2014, p. 18.

C Step changes

In developing our alternative opex forecast, we recognise that there may be changed circumstances in the forecast period that may impact on the expenditure requirements 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. We would not include a step change if the opex that would otherwise be incurred to reasonably reflect the opex criteria is already covered in another part of our alternative forecast, such as our estimate of base opex or the rate of change.

This appendix sets out our consideration of step changes in determining our opex forecast for ActewAGL for the 2014–19 period.

C.1 Final position

We have included two step changes, totalling \$6.0 million, in our alternative opex forecast:

- Environment, health, safety and quality (EHSQ) step change for bushfire mitigation and asbestos costs. This is because we agree that new regulatory obligations will lead to higher costs.
- Regulatory compliance and strategy step change for increased regulatory reporting requirements, changes to the National Energy Customer Framework (NECF), changes to the National Electricity Rules (NER) regarding network pricing arrangements and the connection of embedded generation. This is because we agree that these new regulatory obligations will lead to higher costs.

We are not satisfied that adding step changes for other cost drivers identified by ActewAGL would lead to a forecast of opex that reasonably reflects the opex criteria.

A summary of the revenue impact of our final position compared to ActewAGL's revised proposal and our draft position is outlined below in Table C.1. Our detailed reasoning is set out in section C.3.2.

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

	Proposal	Draft position	Revised proposal	Final position
Environment, health, safety and quality (EHSQ)	2.8	0.0	2.8	1.4
Regulatory compliance and strategy	8.6	1.4	8.6	4.5
Network operations and call centre	2.1	0.0	2.1	0.0
Technical standards	1.5	0.0	1.4	0.0
Contractor management	3.1	0.0	3.1	0.0
Safe work practices	3.5	0.0	3.5	0.0
Network OT support	4.8	0.0	4.8	0.0
Corporate services charges	10.1	0.0	17.0	0.0
Allocation of corporate services charges	-1.2	0.0	-0.2	0.0
Asset management optimisation			1.1	0.0
Total	35.3	1.4	44.1	6.0

Note: Numbers may not add due to rounding.

C.2 Position in draft decision

In our draft decision we included one step change of \$1.4 million in our alternative opex forecast for regulatory compliance costs. We included the step change because we were satisfied ActewAGL would incur costs as the result of increased regulatory obligations.

In general ActewAGL outlined two drivers for the step changes it proposed:

- a change in its strategies and policies
- a change in its regulatory obligations and the external environment.⁸⁷³

We considered that the step changes driven by a change in ActewAGL's strategies and policies did not require an increase in total opex. We considered step changes should generally relate to a new obligation or some change in the service provider's operating environment beyond its control rather than to a discretionary business decision. We did not consider a prudent and efficient service provider would require additional opex because of a change in its strategies and policies.

⁸⁷³ ActewAGL, *Regulatory proposal*, July 2014, p. 227.

We determined that most of the step changes ActewAGL linked to regulatory obligations were for existing rather than new regulatory obligations and did not require an increase in total opex. In applying our forecasting approach, our underlying assumption was that where a regulatory obligation existed before or during the base year, the efficient and prudent costs of compliance would be accounted for in our estimate of base opex.

We recognised a service provider may at different times need to spend relatively less or more opex to meet its existing regulatory obligations. However, it was not enough for ActewAGL to demonstrate that the cost of meeting an existing regulatory obligation was forecast to change. Fluctuations in expenditure on categories of opex are a normal part of business. We would expect these fluctuations in categories of expenditure could be managed by a business without increasing its total opex.

Other step changes ActewAGL proposed did involve changes to regulatory obligations since the base year. However, ActewAGL did not provide sufficient evidence to convince us that the changed regulatory obligation would lead to an increase in its total opex. When we consider a step change, it is not enough for ActewAGL to demonstrate that the regulatory obligation has changed. It must clearly demonstrate how and why this would lead to changes in costs.

Where a step change was due to a new regulatory obligation, we outlined in our Guideline that service providers need to clearly demonstrate:⁸⁷⁴

- how the regulatory obligation has changed or is forecast to change from the base year
- why the regulatory obligation has involved a forecast change in costs
- what options the service provider has undertaken to address the change in the regulatory obligation
- why its preferred option is the most efficient one.

We agreed that ActewAGL had incurred costs due to new regulatory obligations. However, we were only satisfied that we needed to provide a step change above our estimate of base opex for \$1.4 million.

The submission from the Consumer Challenge Panel⁸⁷⁵ supported the view that many of the step changes proposed by ActewAGL should be funded out of the base opex allowance.

⁸⁷⁴ AER, *Expenditure forecast assessment guideline*, November 2013, p. 11.

⁸⁷⁵ Consumer Challenge Panel, *Submission on draft decision and ActewAGL's revised regulatory proposal*, 13 February 2015, p. 19.

C.3 ActewAGL's revised proposal and submissions

This section outlines ActewAGL's revised proposal, our assessment approach and our assessment of each of the proposed step changes. We also address ActewAGL's comments on our assessment approach.

In its revised proposal, ActewAGL re-proposed the same nine step changes it originally proposed, plus it included a new step change for asset management optimisation of \$1.1 million. It also increased the size of its corporate services charges step change from \$10.1 million to \$17.0 million. This increased the total value of ActewAGL's proposed step changes by 25 per cent to \$44.1 million over the 2014–19 period. The ten step changes represent 12 per cent of its total revised opex proposal.⁸⁷⁶

C.3.1 Assessment 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.⁸⁷⁷ Our assessment approach as first outlined in our draft decision is consistent with the approach specified in our Guideline.⁸⁷⁸

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

We generally consider an efficient base level of opex is sufficient for a prudent and efficient service provider to meet all existing regulatory obligations. This is the same regardless of whether we forecast an efficient base level of opex based on the service provider's revealed efficient costs or the benchmark operating expenditure that would be incurred by an efficient provider. We only include a step change in our opex forecast if we are satisfied a prudent and efficient service provider would need an increase (or decrease) in its opex to meet the opex criteria.

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

A step change should not double count the costs of increased volume or scale compensated through the forecast change in output. We account for output growth by

⁸⁷⁶ ActewAGL, *Revised regulatory proposal*, January 2015, pp. 217-218.

⁸⁷⁷ NER, clause 6.6.5(c).

⁸⁷⁸ AER, *Expenditure forecast assessment guideline*, November 2013, pp.11 and 24. We said we would apply this guideline in our Stage 2, Framework and approach.

applying a forecast output growth factor to the opex base year. If the output growth measure used captures all changes in output then step changes that relate to forecast changes in output will not be required. For example, a step change is not required for the maintenance costs of new office space required due to the service provider's expanding network. The opex forecast has already been increased (from the base year) to account for forecast network growth.⁸⁷⁹

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

Further to assessing whether step changes are captured in other elements of the opex forecast, we will assess the reasons for, and the efficient level of, the incremental costs (relative to that funded by base opex and the rate of change) that the service provider has proposed. In particular we have regard to:⁸⁸⁰

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

One important consideration is whether each proposed step change is driven by an external obligation (such as new legislation or regulations) or an internal management decision (such as a decision to increase maintenance opex). Step changes should generally relate to a new regulatory obligation or some change in the service provider's

⁸⁷⁹ This is consistent with our decision in the Powerlink determination; AER, *Final decision: Powerlink transmission determination 2012–17*, April 2012, pp, 164–165.

⁸⁸⁰ AER, *Expenditure assessment forecast guideline*, November 2013, p. 11.

operating environment beyond its control. It is not enough to simply demonstrate an efficient cost will be incurred for an activity that was not previously undertaken. As noted above, the opex forecasting approach may capture these costs elsewhere.

Usually step changes are not required for discretionary changes in inputs.⁸⁸¹ Efficient discretionary changes in inputs (not required to increase output) should normally have a net negative impact on expenditure. For example, a service provider may choose to invest capex and opex in a new IT solution. The service provider should not be provided with a step change to finance the new IT since the outlay should be at least offset by a reduction in other costs if it is efficient.⁸⁸² This means we will not allow step changes for any short-term cost to a service provider of implementing efficiency improvements. We expect the service provider to bear such costs and thereby make efficient trade-offs between bearing these costs and achieving future efficiencies.

One situation where a step change may be required is when a service provider chooses an operating solution to replace a capital one.⁸⁸³ 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.

ActewAGL disagreed with the assessment approach we applied to step changes in our draft decision. It considered our approach to only allow step changes for costs associated with new regulatory obligations and for capex/opex trade-offs to be inconsistent with the NER.⁸⁸⁴ It instead considered the approach for assessing step changes must comply with the NER.

We do not agree with ActewAGL that our assessment approach is inconsistent with the NER. As outlined in our draft decision and above, step changes are provided for any additional costs, further to our estimate of base opex and the rate of change, that are needed for the total opex forecast to reasonably reflect the opex criteria.⁸⁸⁵ This is consistent with the NER.

In applying this approach, we typically consider our estimate of base opex (adjusted for our estimate of the rate of change in base opex) is generally sufficient for a prudent and efficient network service provider to deliver network services while maintaining the safety of the system and complying with existing regulations. We outline our approach to estimating base opex in Appendix A and our approach to estimating the rate of change in base opex in Appendix B. We take into account a range of different cost

⁸⁸¹ AER, *Expenditure assessment forecast guideline*, November 2013, p. 24.

⁸⁸² We did not accept a step change proposed by SP AusNet for a technology innovation program because such an innovation program should have been self-funding; AER, *Draft decision: SP AusNet Transmission determination 2013–18*, August 2013, pp. 240–241.

⁸⁸³ AER, *Expenditure assessment forecast guideline*, November 2013, p. 24; AER, *Explanatory guide: Expenditure assessment forecast guideline*, November 2013, pp. 51–52.

⁸⁸⁴ ActewAGL, *Revised regulatory proposal*, January 2015, pp. 216–217.

⁸⁸⁵ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, pp. 7-144-147.

drivers faced by a service provider in considering both our estimate of base opex and the rate of change in base opex.

We are open to considering step changes that have not already been accounted for in the opex forecast. We typically find that step changes for new or changed regulatory obligations or efficient capex- opex trade-offs are not already accounted for. This is because changed regulatory obligations clearly represent a change in the scope of activities a service provider must undertake to deliver standard control services. Efficient capex/opex trade-offs represent an efficient change in the inputs required to deliver standard control services.

We recognise that there could be other changes to opex, not accounted for through our estimate of base opex and rate of change which is required to meet the opex criteria. For this reason, we assess each proposed step change on its merits. If we are presented with persuasive evidence that a service provider would incur opex to meet the opex criteria in addition to our estimate of base opex (adjusted for our estimate of the rate of change in base opex), then will include a step change for other reasons.

However, in identifying other reasons why step changes may occur we consider it is important that the approach to identifying these cost drivers is not subject to bias. The ultimate test we must apply is that step changes are only applied where they are needed for the total opex forecast to reasonably reflect the opex criteria. For instance, we do not consider we should apply a step change just because opex on a particular category is expected to rise. Over a regulatory control period, opex on various categories of opex will both increase and decrease. However, fluctuations in opex at the category level can often be managed by a prudent and efficient service provider without increasing its total opex. For instance, a service provider can re-prioritise some areas of opex. Therefore a step change in total forecast opex may not be necessary. As identified in our forecasting methodology appendix (Appendix D), if a business uses a category specific forecasting approach to forecast opex on categories where base year opex was low, but not for those where base opex was high, our forecast of total opex will systematically exceed the efficient level of opex, consistent with the opex criteria.

C.3.2 Assessment of proposed step changes

We have included step changes, totalling \$6.0 million, for ActewAGL's increased regulatory compliance costs in our alternative opex forecast. This is an increase from our draft decision estimate of \$1.4 million. We have changed our estimate where ActewAGL has provided further evidence in relation to new regulatory obligations it faces in the 2014–19 period.

For many other proposed step changes, we have not included a step change in our alternative opex forecast. This is for a few common reasons:

- We were not satisfied ActewAGL had demonstrated it faced increased regulatory obligations or requirements in the forecast period.

- The proposals were for costs which we would typically consider to be business as usual expenses, and therefore taken into account in our estimate of base opex or our forecast rate of change.

We assess each proposed step change below.

Environmental, health, safety and quality (EHSQ)

We have included a step change in our alternative opex forecast of \$1.4 million for the bushfire mitigation and asbestos components of the EHSQ step change. This is because we agree that recent revisions to the ACT Strategic Bushfire Management Plan 2014 and the Dangerous Substances (Asbestos Safety Reform) Amendment Bill 2014 represent new regulatory obligations and will lead to higher costs.

We have not included a step change for the other drivers ActewAGL proposed as part of the EHSQ step change in our final decision.⁸⁸⁶ We do not consider there is sufficient evidence to increase our alternative opex forecast for these cost drivers.

We have assessed ActewAGL's forecast according to the following categories:

- work, health and safety
- environment and public safety - bushfire mitigation
- asbestos and unexploded ordnance
- climate change resilience.⁸⁸⁷

Work, health and safety

We have not included a step change related to the work, health and safety (WHS) component of the EHSQ step change in our final decision. This is because we are not satisfied that ActewAGL's WHS obligations have materially increased since 2012–13.

In its original proposal, ActewAGL proposed an increase in opex for a number of activities it had initiated or planned to initiate to reduce various health and safety risks as part of the EHSQ step change.⁸⁸⁸

ActewAGL considered that legislative change in the 2009–14 regulatory control period, including the *Work Health and Safety Act 2011* (Cth) (WHS Act 2011), would continue to drive cost increases in the 2014–19 period. This was because it expected 13 codes of practice were likely to be introduced under the WHS legislation, which would require it to update its health and safety procedures.

⁸⁸⁶ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, pp. 7-149-151.

⁸⁸⁷ ActewAGL, *Revised regulatory proposal*, January 2015, p. 218-235.

⁸⁸⁸ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 9.

In our draft decision, we did not include a step change related to changes to the WHS legislation in our alternative opex forecast. This was because we were not satisfied that the WHS obligations placed on ActewAGL had materially increased since 2012–13.

We did not dispute that ActewAGL has a duty of care under the WHS Act 2011 and to meet safety requirements under the Utilities Act 2000. However, we noted that we generally consider our estimate of base opex is sufficient for a prudent and efficient service provider to meet all its existing regulatory obligations. We considered the WHS Act 2011 was an existing obligation in the base year. We only include a step change in our alternative opex forecast if we are satisfied an increase above this amount is necessary to reasonably reflect the opex criteria.

One of the key reasons the national WHS Act 2011 was introduced was to harmonise work health and safety legislation across jurisdictions in order to reduce regulatory burden. The regulatory impact statement (RIS) underpinning the harmonised WHS Act 2011 stated:⁸⁸⁹

The harmonisation of work health and safety legislation is part of the COAG National Reform Agenda aimed at reducing regulatory burdens and creating a seamless national economy. These reforms aim to deliver more consistent regulation across jurisdictions and to reduce excessive compliance costs on business.

We examined whether requirements under the WHS Act 2011 were more onerous than the requirements under its predecessor, the *Work Safety Act 2008* (ACT), but found no evidence that this was the case.⁸⁹⁰

Further, we did not consider the codes of practice ActewAGL stated were likely to be introduced in the 2014–19 period under the WHS legislation were new regulatory obligations. The codes of practice provide details on how to achieve the standards required under the existing WHS legislation. They are not new obligations. We expect service providers to comply with amended regulatory codes within the normal course of business.

We have assessed ActewAGL's revised proposal and we have not changed our position on the work, health and safety component of the EHSQ step change.

In its revised proposal, ActewAGL's maintained its position that the WHS Act 2011 constituted a major regulatory change which requires a material increase in expenditure that was not reflected in its revealed costs.⁸⁹¹

⁸⁸⁹ Safework Australia, *Decision Regulation Impact Statement for National Harmonisation of Work Health and Safety Regulations and Codes of Practice*, 7 November 2011.

⁸⁹⁰ In our draft decision we referenced Safe Work Australia's regulation impact statement (RIS) concerning the WHS Act 2011. While the RIS stated it was unclear whether compliance costs under the harmonised WHS Act 2011 for single-state businesses would reduce (as for multistate businesses), it did not find that compliance costs would increase.

⁸⁹¹ ActewAGL, *Revised regulatory proposal*, January 2015, p. 222.

ActewAGL disagreed with our assessment that the obligations under the WHS Act 2011 were not more onerous than the requirements which existed under the Work Safety Act 2008. In its revised proposal, ActewAGL stated the WHS Act 2011 is a new law with new and broader definitions and concepts than those in previous laws. In order to comply with the new WHS Act, regulation and codes of practice, ActewAGL stated additional costs have been and will continue to be incurred.⁸⁹²

We do not agree. The WHS Act 2011 is not a new law. Rather it is an existing law that came into effect in the ACT from 1 January 2012.

Nor do we consider the WHS Act 2011 to be a different regime to that which preceded it. The Work Safety Act 2008 had a similar structure to the WHS Act 2011, and used regulations, codes of practice and Australian standards in a similar way.

ActewAGL stated that the codes of practice made under the WHS Act 2011 are new regulatory obligations:

Complying with the new Codes of Practice is required to ensure ActewAGL Distribution can demonstrate that it has met the WHS Act risk management and primary duty of care duties and as such ActewAGL Distribution will require a material increase in expenditure during the 2014–19 regulatory control period.⁸⁹³

ActewAGL has not provided sufficient information or evidence to satisfy us that we should change our draft position on this issue.

Firstly, codes of practice also existed under the Work Safety Act 2008 and performed essentially the same function. Safe Work Australia developed the codes of practice to support the WHS Act 2011 largely based on the codes and guidelines that supported the Work Safety Act 2008 through a process of national harmonisation.⁸⁹⁴ We do not consider we should include a step change for what is essentially an update to an existing feature of ActewAGL's safety regulation.

Secondly, codes of practice are not regulatory obligations. Codes of practice are practical guides to achieve the standards of health, safety and welfare required under the WHS Act 2011.⁸⁹⁵ They are not binding in the sense of imposing legal requirements. Rather, codes function as safe harbour provisions. If a person can show they complied with the code, they are unlikely to have breached their obligations under the WHS Act 2011. WorkSafe ACT, which publishes the codes which apply to ActewAGL, notes this specifically.⁸⁹⁶

⁸⁹² ActewAGL, *Revised regulatory proposal*, January 2015, p. 220.

⁸⁹³ ActewAGL, *Revised regulatory proposal*, January 2015, p. 222.

⁸⁹⁴ Intergovernmental Agreement for Regulatory and Operational Reform in Occupational Health and Safety, July 2008; also <http://www.safeworkaustralia.gov.au/sites/swa/model-whs-laws/model-cop/pages/model-cop>.

⁸⁹⁵ Safe Work Australia, Codes of Practice and Guidance Material Information Sheet, www.safeworkaustralia.gov.au.

⁸⁹⁶ Safe Work Australia, 2014, *Model Codes of Practice*.

Codes of Practice are designed to be used in conjunction with the Act and the Regulation but do not have the same legal implications. A person cannot be prosecuted for failing to comply with a Code of Practice.

An inspector may refer to an approved Code of Practice when issuing an improvement or prohibition notice and may offer the person to whom the notice is issued a choice of ways in which to remedy the contravention.

Approved Codes of Practice offer practical examples of good practice. They give advice on how to comply with the law by, for example, providing a guide to what is 'reasonably practicable' in particular circumstances.⁸⁹⁷

In its revised proposal ActewAGL stated the WHS Act 2011 introduced terminology and broader concepts than existed under previous legislation. In its revised proposal ActewAGL stated:

The 'far reaching and much broader' provisions in the Act relating to the primary duty of care means that its Board members, executive and managers must ensure, so far as is reasonably practical, that the health and safety of workers and other persons, including the public, is not put at risk from the distribution network or work carried out as part of the conduct of the business or undertaking.⁸⁹⁸

We examined the key features of the WHS Act 2011 and the new terminology it introduced. WorkSafe ACT lists the key features of the legislation as:⁸⁹⁹

- continuation of the definition of 'worker' under the previous Work Safety Act 2008 as including more than just employees, for example, contractors, volunteers, etc.
- continuation of the emphasis in the previous Work Safety Act 2008 on those who engage workers in the conduct of a business or undertaking as the primary safety duty holder
- continuation of the inclusion in the Work Safety Act 2008 of upstream and other similar duty holders amongst persons undertaking a business undertaking (PCBUs)
- a duty for a PCBU to, as far as is reasonably practicable, provide a safe workplace and a safe systems of work
- where a PCBU has a safety duty, an 'officer' within the business has a 'due diligence' requirement to take steps to assist the PCBU in meeting its obligations
- the primary means of providing a safe working environment is through eliminating or, if elimination is not possible, minimising risk

⁸⁹⁷ <http://www.worksafety.act.gov.au/page/view/2798#Codes of Practice> accessed 31 March 2015.

⁸⁹⁸ ActewAGL, *Revised regulatory proposal*, January 2015, p. 221.

⁸⁹⁹ <http://www.worksafety.act.gov.au/page/view/2798#Codes of Practice>, updated September 2014, accessed 31 March 2015.

- employers must consult with workers to allow them to contribute directly to the management of risk and creation of a safe working environment.

WorkSafe ACT list the new terminology introduced in the WHS Act 2011 as:

- 'work safety' becomes 'work health and safety' or WHS
- 'worker consultation units' become 'work groups'
- 'work safety representatives' and 'work safety committees' become 'health and safety representatives' and 'health and safety committees'
- 'authorised representatives' become 'WHS entry permit-holders'.

It does not necessarily follow that the broader definitions introduced in the WHS Act 2011, listed above and referred to by ActewAGL, place a greater regulatory burden on ActewAGL than existed previously.

For example, under the WHS Act 2011, a contractor is a worker and is owed duty of care by the person conducting a business or undertaking (PCBU). However, ActewAGL's duty of care to contractors has not changed. It owed a duty, in almost identical terms, under the previous legislation.⁹⁰⁰

Both the WHS Act 2011 and its predecessor refer to duties of care. Further, the broader concept of a person conducting a business or undertaking (PCBU) includes principle contractors. However, both the WHS Act 2011 and its predecessor required ActewAGL to complete a Safe Work Method Statement for both employers and principal contractors.⁹⁰¹

Many of the statutory requirements imposed on ActewAGL by the WHS Act 2011 were imposed on it previously. An example is that of the standard of 'reasonably practical' (in avoiding risk). ActewAGL refers to the standard of 'reasonably practical' under the WHS Act 2011. This standard was set out in s. 14 of the previous Work Safety Act 2008. Accordingly, ActewAGL's claim that the WHS Act means it needs to conduct additional risk assessment seems unsubstantiated. We do not consider ActewAGL explained how any of the other broader concepts it listed would increase its opex in the forecast period.

We note that we have taken into account differences in Occupational Health and Safety Regulations between ActewAGL and other jurisdictions in forming our estimate of base opex. This is discussed in the base year appendix A.

⁹⁰⁰ Work Safety Act 2008 (ACT) (repealed), s. 21.

⁹⁰¹ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-228.

Environment and public safety - bushfire mitigation

We have included a step change for the bushfire mitigation component of the EHSQ step change in our final decision. We are satisfied that ActewAGL's bushfire mitigation obligations have increased since the base year. This is a change in position from our draft decision.

In its original proposal, ActewAGL proposed a step change for bushfire mitigation. ActewAGL stated that in light of bushfires and subsequent inquiries and litigation in other states, it intended to update its Bushfire Mitigation Strategy and Management Plan in 2015–16. In addition, ActewAGL stated that the ACT Strategic Bushfire Management Plan 2009 (SBMP) was under review and might require it to change its bushfire planning and operations.⁹⁰²

In our draft decision, we did not include a step change to account for changes in the ACT's bushfire mitigation standards or in ActewAGL's Bushfire Mitigation Strategy and Management Plan. We considered complying with bushfire mitigation standards is a normal obligation of providing network services. We also considered ActewAGL had not presented us with any evidence that likely changes in standards would be more onerous than existing standards.

In its revised proposal, ActewAGL stated that it requires a step change for increased costs for bushfire mitigation to comply with recent revisions to the ACT Strategic Bushfire Management Plan (SBMP) 2014.⁹⁰³ The SBMP is an instrument under the *Emergencies Act 2004* (ACT).⁹⁰⁴

ActewAGL stated that the revised SBMP 2014 explicitly requires it to take a new role of shared responsibility.⁹⁰⁵ It stated that version 3 obliges it to have a bushfire operations plan approved by the ACT Emergency services agency (ESA) each year, where version 2 imposed no specific obligations on ActewAGL to have a bushfire operational plan or to liaise with the ESA. It stated these costs are not included in the base year or accounted for in the rate of change.⁹⁰⁶

We have assessed ActewAGL's revised proposal and we are now satisfied that ActewAGL's bushfire mitigation obligations have increased as a result of the revised SBMP 2014. Therefore we have included a step change (as part of the overall EHSQ step change) in our total opex forecast to account for this increase.

⁹⁰² ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 11, 43.

⁹⁰³ ActewAGL, *Revised regulatory proposal*, January 2015, pp. 227-229.

⁹⁰⁴ ACT Emergency Services Agency, *The ACT Strategic Bushfire Management Plan 2014–19, Schedule 2*, 2014, p. 85.

⁹⁰⁵ ActewAGL, *Revised regulatory proposal*, January 2015, p. 219.

⁹⁰⁶ ActewAGL, *Revised regulatory proposal*, January 2015, p. 218.

Asbestos and unexploded ordnance

We have not included a step change for the unanticipated costs associated with asbestos discoveries or with unexploded ordnance in our alternative opex forecast. However, we have included a step change for the new regulatory obligations required by the amendment of the *WHS Regulation (regarding asbestos training)* and by the *Dangerous substances Amendment Bill 2014* issued 25 November 2014. This is a change in position from our draft decision.

In its original proposal, ActewAGL proposed an increase in opex for unplanned safety events including unanticipated costs associated with asbestos discoveries and planned work in areas known to have unexploded ordnance.

ActewAGL stated that it expects to incur unanticipated costs associated with asbestos discoveries when constructing electricity infrastructure in new land developments and older areas of Canberra. It anticipates that the incidences of unexpected asbestos discoveries will continue to increase over the next regulatory period as the undergrounding of electrical assets continues in new and old development areas. ActewAGL also expects to incur unanticipated costs associated with unexploded ordnance when constructing electricity infrastructure in the Molongolo region because there used to be a military firing range in that area 95 years ago.⁹⁰⁷

In our draft decision, we did not include a step change to account for asbestos or unexploded ordnance in our alternative opex forecast. We were not convinced that the risk associated with asbestos was an incremental risk and ActewAGL did not link these costs to a new regulatory obligation. To the contrary, we considered the costs of constructing electricity infrastructure in new and older areas of Canberra were business as usual costs for ActewAGL. Nor did we consider ActewAGL would incur material costs related to unexploded ordnance.⁹⁰⁸

In its revised proposal, ActewAGL stated the ACT Government had changed strategies to release/rezone land previously zoned as industrial to high density residential developments. It stated this strategy has led to unanticipated costs associated with significant asbestos discoveries in brownfield developments during the current period. ActewAGL also stated that incidences of unexpected asbestos discoveries will continue to increase over the 2014–19 period as the undergrounding of electricity assets continues in re-development areas. It states that this is not covered by the development cost. Developers work within the property boundary. However ActewAGL states that it operates outside the property boundary without the ability to charge the developer.⁹⁰⁹

We maintain our draft position that the costs of constructing electricity infrastructure in new and older areas of Canberra are business as usual costs for ActewAGL.

⁹⁰⁷ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 10.

⁹⁰⁸ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-221.

⁹⁰⁹ ActewAGL, *Revised regulatory proposal*, January 2015, pp. 231-232.

In relation to unanticipated costs associated with unexploded ordnances, ActewAGL stated in its revised proposal that the Molongolo area will be developed for residential use but that it is known to have been used as an artillery range with unexploded ordnance having been found. Under the WHS Act 2011 ActewAGL stated it must address the risk associated with sending staff into an area with a known hazard without any risk controls.⁹¹⁰

ActewAGL has not provided sufficient evidence to satisfy us that it will bear the responsibility of dealing with the risk of unexploded ordnance in the new Molongolo development. The Land Development Agency (LDA) stated that having identified the risk of unexploded ordnance in Molongolo Stage 2 it had undertaken steps to test and clear the area in the vicinity of construction of key infrastructure.⁹¹¹ The LDA stated that it will also engage specialists to undertake an ordnance survey in Molongolo stage 3 to ensure it is clear of all unexploded ordnance.⁹¹² In any case we note that its proposal relates to unanticipated costs. We do not consider there is a reasonable methodology for estimating these unanticipated costs.

We have included additional funding of \$1.1 million in our final decision for costs ActewAGL will incur as a result of changed regulatory obligations regarding asbestos. The new obligations are due to the amendment of the WHS Regulations section 445 (asbestos training) and by the Dangerous substances (asbestos safety reform) Amendment Bill 2014.⁹¹³ The increased costs are associated with complying with the following regulatory changes:

- The WHS Regulation, Section 445 amended in 2014, requires occupations who work with asbestos to complete accredited "Asbestos Awareness" training only with ACT WorkSafe accredited training providers.⁹¹⁴
- The Dangerous Substances (Asbestos Safety Reform) Amendment Bill 2014 was passed in the ACT Legislative Assembly, after ActewAGL submitted its regulatory proposal. It removed the 10 square metre exemption which means that any asbestos can only be removed by licenced asbestos removalists.
- ActewAGL's database of non-residential asbestos sites must now be maintained by a licenced asbestos assessor. All sites are reassessed annually.

Climate change resilience

We have not included a step change in our alternative opex forecast for climate change resilience in our final decision. We are not satisfied that an increase in opex for

⁹¹⁰ ActewAGL, *Revised regulatory proposal*, January 2015, p. 232.

⁹¹¹ Land Development Agency, Annual report 2012–13, p. 20.

⁹¹² http://www.procurement.act.gov.au/_data/assets/pdf_file/0008/538811/Letter_of_Acceptance.pdf, accessed 13 March 2015.

⁹¹³ ActewAGL, *Revised Regulatory proposal*, January 2015, p. 231.

⁹¹⁴ ACT WorkSafe, 2014, Work Health and Safety Legislation. <http://www.worksafe.act.gov.au/page/view/1207>.

this cost driver is necessary for our opex forecast to reasonably reflect the opex criteria.

ActewAGL originally proposed an increase in opex for climate change resilience. It stated it would need to understand how and when to adapt to potential increased risks from climate change.⁹¹⁵

The McKell Institute submitted that we should allow sufficient expenditure for ActewAGL to account for climate change risk.⁹¹⁶

We did not provide a step change in our draft decision for climate change and resilience. ActewAGL did not link it to a regulatory change nor did it specify or quantify the costs of this project. We also considered ActewAGL had been aware of the risks of climate change for some time. We expected that as a prudent business it would have begun considering how these risks could impact on its business and that those costs would be reflected in base opex.⁹¹⁷

In its revised proposal, ActewAGL stated that although it had begun considering climate change risks on the business, the base year did not include adequate expenditure to sufficiently address the risk in the future. ActewAGL also stated that the Energy Networks Association (ENA) had produced a climate risk and resilience manual for the energy network sector. It stated that by using industry agreed processes consistent with the manual, it could now undertake a risk assessment to understand the extent of the risk and how it might specifically address threats to specific assets.⁹¹⁸

As discussed above, ActewAGL proposed a number of step changes for projects that it claims are not included in its base year. A new program or project, may, in isolation, be prudent. However, we consider base opex already reflects the cost of meeting existing regulatory obligations, and maintaining the reliability, safety and quality of supply of the network. In this case, we are not satisfied that that total opex would need to increase for this cost driver.

The ACT Council of Social Service submitted that it does not support the unfair transfer of risk around challenges such as climate change to customers.⁹¹⁹

Regulatory compliance and strategy

We have included a step change of \$4.5 million in our alternative opex forecast for some, but not all components of ActewAGL's regulatory compliance and strategy step change. We have included the step change because we consider ActewAGL will incur

⁹¹⁵ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 10.

⁹¹⁶ McKell Institute, *Submission on draft decision and ActewAGL's revised regulatory proposal*, 13 February 2015, pp. 11-12.

⁹¹⁷ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-221.

⁹¹⁸ ActewAGL, *Revised regulatory proposal*, January 2015, p. 233.

⁹¹⁹ ACT Council of Social Service (ACTCoSS), *Submission on draft decision and ActewAGL's revised regulatory proposal*, 13 February 2015, p. 2.

costs due to changed regulatory obligations. This is a change in position from our draft decision.

In its original proposal, ActewAGL proposed a regulatory compliance and strategy step change of \$8.6 million. It comprised seven smaller step changes for a number of activities related to regulatory compliance. ActewAGL stated the step change was driven by an increase in regulatory obligations triggered by the changes to the NER relating to the economic regulation of network service providers.⁹²⁰

In our draft decision, we included a step change of \$1.4 million for:

- increased regulatory reporting requirements
- changes to the National Energy Customer Framework (NECF)
- changes to the National Electricity Rules (NER) regarding network pricing arrangements and the connection of embedded generation.⁹²¹

We were satisfied that these costs should be included in our alternative opex forecast because they were driven by new regulatory obligations. We considered the other costs related to existing not new regulatory requirements.

In its revised proposal, ActewAGL repropoed a regulatory compliance and strategy step change of \$8.6 million. It stated the increase in costs from base year opex is driven by the increasing volume and complexity of compliance and regulatory requirements as a result of new obligations. The costs included in this step change are for specialist consultants, auditors and additional highly skilled internal staff.⁹²²

In this section we reassess each of the components of the regulatory compliance step change having regard to ActewAGL's revised proposal and the submissions we received.

Increased regulatory reporting

We have included a step change of \$3.1 million for the cost of increased regulatory reporting in our final decision. The reporting includes complying with benchmarking regulatory information notices (RINs), category analysis RINs, reset RINs, but not annual reporting RINs. This is an increase from the \$1.0 million we included in our draft decision.

In its original proposal, ActewAGL proposed a step change for increased regulatory reporting costs of \$3.3 million, as part of the overall regulatory compliance and strategy step change. It stated the AER's new Guideline and RINs required it to provide

⁹²⁰ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, pp. 14-17.

⁹²¹ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, pp. 7-151-155.

⁹²² ActewAGL, *Revised regulatory proposal*, January 2015, p. 236.

significantly more information and detail in its regulatory proposals and RIN responses.⁹²³

In our draft decision, we included a step change of only \$1 million for the cost of completing benchmarking RINs, category analysis RINs and reset RINs. We calculated the increased regulatory reporting costs incurred by ActewAGL based on its estimate of the costs of submitting benchmarking RINs, category analysis RINs and reset RINs. However, we substituted lower labour costs than ActewAGL used in its estimate to reflect labour costs we considered were more reasonable to collect and collate data and did not include all of the proposed consultancy costs.⁹²⁴

In its revised proposal, ActewAGL maintained its request for \$3.3 million for increased regulatory reporting costs.⁹²⁵ ActewAGL stated it required:

- half a full time equivalent (FTE) to complete the category analysis, benchmarking and annual reporting RINs plus the use of technical consultants and auditors
- two FTEs to complete the reset RINs plus additional support of specialist consultants.

ActewAGL also stated the efficient collecting, collating and publishing of RIN data requires more experienced employees than average which results in a higher average labour cost. Adjustments for less experienced staff would require a corresponding increase in the number of staff to compensate for the decreased productivity.

In our final decision, consistent with our draft decision, we are satisfied that ActewAGL will incur costs due to the increased complexity and volume of new regulatory reporting obligations. However, we have recalculated the costs we expect ActewAGL will incur to submit benchmarking RINs, category analysis RINs and reset RINs. We increased our forecast to reflect ActewAGL's labour cost forecast which was higher than the one we used. We also increased our forecast to correct an error we made by not including the costs of complying with reset RINs and of engaging specialist consultants for this task.

We maintain our draft position not to include a step change for the costs of submitting annual reporting RINs. ActewAGL already had to comply with annual reporting RINs in the 2009–14 regulatory control period and they are not significantly more complex now than they were then.

National Energy Customer Framework (NECF)

We have included a step change in our total opex forecast of \$0.2 million for customer connection charges but not for reporting breaches related to the NECF.

⁹²³ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 16.

⁹²⁴ We substituted an FTE cost of \$180,000 in place of ActewAGL's proposed FTE costs of \$232,500. This reduced the labour component of the step change by 77%.

⁹²⁵ ActewAGL, *Revised regulatory proposal*, January 2015, pp. 237-239.

In its original proposal, ActewAGL stated a component of the regulatory compliance and strategy step change was for a significant increase in regulatory compliance and reporting obligations related to the NECF.⁹²⁶ ActewAGL proposed a step change of around \$0.3 million for expenditure related to the NECF for the implementation of customer connection charges and quarterly reporting of NECF breaches.

In our draft decision, we included an opex step change of \$0.2 million for the implementation of customer connection charges related to the NECF because it was a new regulatory obligation. While the NECF legislative package was introduced in the ACT on 1 July 2012, the implementation of the Customer Connection Charges was deferred to 1 July 2014.

We did not include a step change for the quarterly reporting of NECF breaches because we did not consider a prudent service provider should assume it is going to breach the NECF.⁹²⁷ Further, the legislation requiring quarterly breach reporting was not deferred beyond 1 July 2012.

In its revised proposal, ActewAGL stated while its target is to have no NECF breaches, it required \$0.1 million to cover technical and legal investigation assessment of potential breaches.⁹²⁸ We have not included a step change for reporting breaches related to the NECF because it is not a new regulatory obligation. Our estimate of base opex already takes into account the efficient cost of meeting ActewAGL's existing regulatory obligations.

National Planning and Expansion Framework (NPEF)

We have not included a step change for the reporting obligations related to the NPEF.

In its original proposal, ActewAGL stated a component of the regulatory compliance and strategy step change was for an increase in regulatory compliance and reporting obligations related to the NPEF.⁹²⁹ It proposed a step change of \$0.8 million because under the NPEF it was required to:

- publish a distribution annual planning report
- investigate demand side solutions
- participate in the service target performance incentive scheme (STPIS).

In our draft decision, we did not include an increase for the reporting obligations related to the NPEF as it was not a new regulatory obligation. This is because the new NER commenced during the base year on 1 January 2013. We considered publishing an annual planning report, investigating demand side solutions and participating in the

⁹²⁶ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 15.

⁹²⁷ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-153.

⁹²⁸ ActewAGL, *Revised regulatory proposal*, January 2015, p. 239.

⁹²⁹ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 15.

STPIS as required by the NPEF were business as usual activities. We considered these costs could be funded through our estimate of base opex.⁹³⁰

In its revised proposal ActewAGL commented on its obligations under the NPEF, stating these costs were significant and have led to ongoing costs that were not incurred in the base year. It did not provide any additional information.⁹³¹

We are not satisfied that ActewAGL provided new information about the NPEF reporting requirements in its revised proposal to cause us to change from our draft position. Our final position is still that we consider these reporting obligations are business as usual activities and not new requirements. As such we have not included a step change for this cost driver in our alternative opex forecast.

Consumer engagement

We have not included a step change for consumer engagement in our final decision. We consider a prudent service provider would already be undertaking an efficient level of consumer engagement so would not need an increase in its total opex. This is consistent with our draft decision.

In its original proposal, ActewAGL stated that following the release of our consumer engagement guideline, it has formalised its consumer engagement activities through the development of a consumer engagement strategy that is to be implemented over the 2014–19 period.⁹³² It proposed a step change of \$1.6 million.

In our draft decision, we did not include a consumer engagement step change in our alternative opex forecast. We stated that we would expect a prudent service provider would already have programs in place to engage with consumers. We considered the new NER requirement to address consumer's concerns in its regulatory proposal would not lead to a material increase in opex and could be funded through the base level of opex.⁹³³

In its revised proposal, ActewAGL stated that while it has historically performed consumer engagement activities, it considered the rule change and our Guideline placed a new regulatory obligation on it as to the extent of consumer engagement.⁹³⁴ It is seeking an increased allowance so it can expand its existing consumer engagement activities. ActewAGL also stated that while it has previously undertaken extensive engagement through sophisticated willingness to pay studies, no study was undertaken in the base year.

The Energy Networks Association (ENA) submitted that it strongly supports the enhanced consumer engagement. It stated that the NSW and ACT electricity

⁹³⁰ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-152.

⁹³¹ ActewAGL, *Revised regulatory proposal*, January 2015, p. 239.

⁹³² ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 15.

⁹³³ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-154.

⁹³⁴ ActewAGL, *Revised regulatory proposal*, January 2015, p. 241.

distribution businesses have made genuine efforts to effectively engage with their consumers.⁹³⁵ We have had regard to the consumer engagement the network service providers have reported and relied upon in preparing their regulatory proposals.

The ACT Council of Social Services supported improved engagement with customer representatives, more active use of the data-base and knowledge of the Energy Ombudsman Office to build a picture of the needs of low income customers. It submitted low income earners were not sufficiently tested in ActewAGL's assessment that customers value reliability over cost.⁹³⁶

A change to the NER requires a service provider to describe in its regulatory proposal how it engaged with consumers and how it sought to address any relevant concerns identified as a result of that engagement.⁹³⁷ We do not consider this rule change would materially increase costs in the forecast period. We expect a prudent service provider would already engage with consumers as part of its reset process to help understand their preferences around prices, reliability and service standards.

We do not consider our consumer engagement guideline is grounds for including a step change. The consumer engagement guideline sets out a framework for service providers to better engage with consumers. It gives service providers a high level framework to integrate consumer engagement into their business-as-usual operations.⁹³⁸ In other words, the consumer engagement guideline represents the level of consumer engagement we expect a prudent and efficient service provider would be engaged in. In addition, we do not consider the consumer engagement guideline is grounds for including a step change because we do not consider our consumer engagement guideline imposes a new regulatory obligation but rather guidance on what we would consider to be effective consumer engagement.⁹³⁹

AEMC network pricing arrangement and review of network tariffs

We have included a step change of \$1.1 million for costs relating to the AEMC network pricing arrangements rule change in our alternative opex forecast. We have included it because we consider the new pricing framework created by the rule change involves a new set of obligations for ActewAGL relative to the current pricing rules. We now also agree ActewAGL will need to engage consultants to assist it to comply with the new AEMC network pricing arrangements. This is a \$1.0 million increase from the amount we included in our draft decision.

⁹³⁵ Energy Networks Association, Submission on draft decision and ActewAGL's revised regulatory proposal, 13 February 2015, p. 15.

⁹³⁶ ACT Council of Social Service (ACTCoSS), *Submission on draft decision and ActewAGL's revised regulatory proposal*, 13 February 2015, p. 3.

⁹³⁷ NER, cl. 6.8.2(c1)(2).

⁹³⁸ AER, *Better Regulation: Consumer engagement guideline for network service providers fact sheet*, November 2013.

⁹³⁹ AER, *Consumer Engagement Guideline for Network Service Providers*, November 2013, p8.

In its original proposal, as part of the Regulatory compliance and strategy step change, ActewAGL proposed:

- \$0.1 million for costs related to the AEMC network pricing arrangements rule change
- \$2.3 million (including \$1.8 million for consultants) to undertake a strategic review of its network tariffs.

ActewAGL proposed that a forthcoming rule change by the AEMC would require it to implement new tariff structures and to engage with customers on network tariff matters. ActewAGL also stated it needed to undertake a strategic review of its network tariff strategy and proposed increased opex of \$2.3 million (including \$1.8 million for consultants) for expenditure to review its network tariffs in light of the AEMC rule change, technological change and changing demand patterns.⁹⁴⁰

In our draft decision, we included \$0.1 million in our opex forecast for costs relating to the AEMC network pricing arrangements rule change. We considered the new pricing framework created by the rule change involved a new set of obligations for ActewAGL relative to the current pricing rules. ActewAGL will be required to comply with long run marginal cost pricing structures and to consult with customers on the new framework.

We did not include an amount in our opex forecast for ActewAGL to undertake a strategic review of its network tariffs. We did not consider a step change was needed for an internal management decision about how better to meet pricing obligations. ActewAGL proposed a large increase in opex to pay for consultants to undertake the tariff review but it did not provide evidence to show how this option was the most efficient one, what other options it considered or how it would benefit consumers.

At the time we published our draft decision, the AEMC finalised the network pricing rule change. The rule change requires network businesses to set prices that reflect the efficient cost of providing network services to individual consumers.⁹⁴¹ ActewAGL will be required to develop a tariff structure statement (TSS) as part of its 2019 revenue proposal and to consult with consumers on its development.

In its revised proposal, ActewAGL stated its proposed review of network tariffs is required to address the AEMC's changed requirements relating to network pricing arrangements.⁹⁴² It stated the new pricing arrangements have created substantial change that requires it to review its network tariffs. The step change costs are for studies to identify long run marginal costs, for the development of a new pricing model and for the preparation of the TSS. The majority of the step change is for consultant costs.

⁹⁴⁰ AEMC, *Distribution network pricing arrangements draft rule change*, August 2014. <http://www.aemc.gov.au/Rule-Changes/Distribution-Network-Pricing-Arrangements>.

⁹⁴¹ <http://www.aemc.gov.au/Rule-Changes/Distribution-Network-Pricing-Arrangements>.

⁹⁴² ActewAGL, *Revised regulatory proposal*, January 2015, pp. 242-243.

We do not consider ActewAGL requires a step change for additional internal staff to undertake a strategic ten year pricing review in order to comply with the changed network pricing arrangements. It is business as usual for ActewAGL to develop tariffs that reflect its pricing principles. However, we do acknowledge that ActewAGL may need to engage consultants to assist it to develop a TSS that reflects marginal cost pricing for its next regulatory proposal to comply with the rule change.

That said, we do not consider ActewAGL has provided sufficient evidence to convince us that a consultant would cost \$1.8 million. The only evidence ActewAGL provided was the following statement:⁹⁴³

A review of network pricing reports released by other DNSPs indicated that several consultancy firms have expertise and experience in network pricing reform, which could be drawn on efficiently for ActewAGL Distribution's review.

ActewAGL did not indicate that it had approached any consultancy firms to provide an estimate of the time or cost required to assist it to identify long run marginal costs, develop a new pricing model and prepare the TSS. Nor did ActewAGL provide any evidence to support its estimate. \$1.8 million would be enough to engage a consultant to work for over two years at a cost of \$3,000 per day. We consider this is too long for such a task.

We consider a more realistic estimate of the time a single consultant would take to identify long run marginal costs, develop a new pricing model and prepare the TSS would be a year at most. This is a conservative estimate as we consider an expert would be able to assist ActewAGL meet the AEMC network pricing rule requirements well within that timeframe. Therefore, we consider a more realistic forecast of the cost of engaging a consultancy firm for this step change would be \$1 million. This would be sufficient to engage a consultant, at a cost of \$3000 per day for over a year.

For these reasons, we have included a total step change of \$1.1 million for costs related to the AEMC network pricing arrangements rule change. This includes the \$0.1 million ActewAGL proposed for the AEMC network pricing arrangements step change and \$1 million for consultants to assist it to comply with the new arrangements.

AEMC connection of embedded generation

ActewAGL proposed an increase in opex of \$0.1 million in its original proposal for expenditure related to the AEMC rule change regarding the connection of embedded generation. We included this increase in our opex forecast in the draft decision because it was driven by a new regulatory obligation. ActewAGL accepted our position in its revised proposal.⁹⁴⁴

⁹⁴³ ActewAGL, *Revised regulatory proposal*, January 2015, p 243.

⁹⁴⁴ ActewAGL, *Revised regulatory proposal*, January 2015, p. 243.

Network operations and call centre and network OT support

We have not included a network operations and call centre step change or a network operations technology (OT) support step change in our alternative opex forecast. We are not satisfied that the cost of these programs would affect the efficient costs of meeting ActewAGL's regulatory obligations and requirements.

In its original proposal, ActewAGL proposed network operations and call centre step change of \$2.1 million and a network OT support step change of \$4.8 million.⁹⁴⁵ Both step changes were primarily to fund additional staff to support new OT systems.

ActewAGL stated its operational infrastructure was aging and insufficient to meet future needs. To address this, in the 2009–14 regulatory control period, it undertook a substantial program of investment in both network and non-network systems through the Operational System Replacement Program (OSRP) and Core Systems Replacement Program (CSRP).

ActewAGL stated the OSRP was needed to upgrade network system operating and reporting capability and to meet the new requirements of the NECF customer service standards and STPIS. As a consequence, ActewAGL stated that additional staff was required to support the new OT systems.

In our draft decision, we outlined the following reasons for not including this proposal in our alternative opex forecast:

- We expected that a business would only invest in OT systems where the benefits of that investment were expected to outweigh the costs.
- The NECF and STPIS were not new regulatory obligations. The NECF was introduced on 1 July 2012 and we approved a cost pass through of \$1.9 million in January 2013 for the establishment and set up of the customer framework. Further, ActewAGL had already been required to report STPIS data for the 2009–14 regulatory control period.⁹⁴⁶

In its revised proposal, ActewAGL maintained its position that greater operational support is required as a result of OT investments:⁹⁴⁷

These step changes are driven by the need to upgrade network system operating and reporting capability following the OSRP and to meet the new requirements for the NECF customer service standards and STPIS.

ActewAGL has not provided information or evidence that has convinced us to change from our draft decision.

⁹⁴⁵ ActewAGL, *Revised regulatory proposal*, January 2015, p. 246.

⁹⁴⁶ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-225.

⁹⁴⁷ ActewAGL, *Revised regulatory proposal*, January 2015, p. 246.

Our alternative opex forecast already takes into account the efficient cost of meeting ActewAGL's existing regulatory obligations or requirements up until the forecast period. Costs associated with network OT support do not affect the quantity or quality of services ActewAGL's network consumers receive in the forecast period. A higher cost in providing standard control services without a demonstrated increase in the quantity or quality of services is, by definition, less efficient. We therefore have not included a step change in our alternative opex forecast for this proposal.

ActewAGL stated that the step changes are also driven by the need to meet the new requirements for the NECF customer service standards and STPIS. However, it has not convinced us that these increased support costs for the new systems are directly or exclusively attributable to the NECF and STPIS reporting requirements. Rather, in its revised proposal it stated:⁹⁴⁸

The completion of the OSRP will enable further necessary OT works planned for the 2014–19 period to meet the needs of ActewAGL's network by ensuring safety, network reliability, quality, and customer service standards are maintained. As a result of these network OT investments, greater opex is required to operate and support these systems as well as to support the transition into future needs.

ActewAGL stated that it is participating in reporting statistics for the STPIS for the first time in 2015–16 and that the granularity of information we request and the frequency of reporting for STPIS has increased since the base year.⁹⁴⁹ We agree that we have not previously applied our national STPIS to ActewAGL. However, as noted in our draft decision, ActewAGL was already required to report STPIS performance data in the 2009–14 regulatory control period. Therefore we do not expect ActewAGL will face a greater reporting burden in the forecast period.

We also note that ActewAGL reports on STPIS through regulatory information notices (RINs). Importantly, we note that we have already included a step change of \$3.1 million for increased regulatory reporting costs in this decision. This is discussed in the 'Increased regulatory reporting' step change section above. Consistent with our Guideline we do not include a step change for costs that are already accounted for elsewhere in our total opex forecast.

In its revised proposal, ActewAGL stated this step change includes on-going costs to meet the system reporting requirements of the NECF. As discussed in our draft decision, the NECF was introduced in the ACT at the start of 2012⁹⁵⁰ so it is an existing rather than a new regulatory obligation. Our estimate of base opex already takes into account the efficient cost of meeting ActewAGL's existing regulatory obligations.

Technical standards

⁹⁴⁸ ActewAGL, *Revised regulatory proposal*, January 2015, p. 246.

⁹⁴⁹ ActewAGL, *Revised regulatory proposal*, January 2015, p. 246.

⁹⁵⁰ <http://www.aemc.gov.au/Energy-Rules/Retail-energy-rules/Guide-to-application-of-the-NECF#What is the NECF.>

We have not included a step change in our alternative opex forecast of \$1.4 million for a technical standards step change. We are not satisfied ActewAGL will incur greater costs for this driver.

In its original proposal, ActewAGL stated a technical standards step change of \$1.4 million was required to address:

- insufficient capacity prior to 2013–14 to meet the ongoing demands of technical standards requirements⁹⁵¹
- the new requirements of the updated Management of Electricity Networks Assets Code under the *Utilities Act 2000* (ACT).

In our draft decision, we did not include a technical standards step change. We did not include it because we considered the cost of ActewAGL complying with updated industry standards and updating its five year technical standards plan should be met from the base level of opex. Further, we did not consider the updated Management of Electricity Networks Assets Code was a new regulatory obligation and we were not satisfied it had imposed a materially heavier burden on ActewAGL than previously.

In its revised proposal, ActewAGL stated that this step change is required to meet the requirements of the updated Management of Electricity Networks Assets Code under the *Utilities Act 2000*, as well as changes to other regulatory obligations relating to safety and technical standards. The updated code has set the compliance with applicable Australian and International standards as a mandated minimum.⁹⁵²

ActewAGL proposed a step change of \$0.5 million to engage specialist consultants for the initial implementation of a five year plan to accommodate changes to the Management of Electricity Networks Assets Code. We have not included increased opex in our alternative opex forecast for this driver.

We agree with ActewAGL that network service providers have an ongoing duty to meet relevant technical and legal obligations. However, regulations are constantly updated or amended over time and compliance with current safety and technical standards is part of business as usual for a service provider. An efficient and prudent service provider would allocate adequate technical resources to meet this ongoing duty. For example, ActewAGL operates an internal team of technical engineers and specialists to meet the technical construction standards and legal obligations for the organisation.

We do not consider we should include a step change in our alternative opex forecast to address insufficient resourcing of the ongoing demands of meeting technical standards. We consider ongoing costs of meeting compliance with existing technical standards requirements should be a business as usual expense, and therefore accounted for through our estimate of base opex.

⁹⁵¹ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 49.

⁹⁵² ActewAGL, *Revised regulatory proposal*, January 2015, p. 243.

In relation to the new requirements of the updated Management of Electricity Networks Assets Code, we agree with ActewAGL that this represents a new regulatory obligation. The Management of Electricity Network Assets Code was updated in August 2013.⁹⁵³ The code is a technical code under the Utilities Act 2000. Unlike the codes of practice under the WHS Act 2011, technical codes under the Utilities Act 2000 are legally binding.

It does not necessarily follow, however, that an updated technical code places a heavier regulatory burden on a service provider than existed previously. Further, even if there is a new technical standard, it does not necessarily follow that a prudent and efficient service provider is not already meeting that standard or needs a step up in opex to meet the new standard.

We assessed whether the regulatory obligations under the updated Management of Electricity Networks Assets Code were greater than under its predecessor. The difference between the new and old codes is the requirement that the electricity distributor must have an asset management plan consistent with PAS 55 and ISO 55000.⁹⁵⁴ The PAS 55 provides guidance and a checklist of good practices in physical asset management. It was last updated in 2008 so it is a well-established standard. Its successor, the ISO 55000, was released in early 2014 and is an international standard covering management of physical assets. The updated Management of Electricity Networks Assets Code, therefore, requires ActewAGL to have an asset management plan that is consistent with the international standard of good practice in asset management.

We consider the new Code requirements are consistent with the business as usual operations of a good practice network operator. In our draft decision we concluded that the requirements of the ISO 55000 standard are not materially different from its predecessor PAS 55 which was recognised standard of good practice. ActewAGL's revised proposal not provided evidence to persuade us otherwise.

Safe work practices

We have not included an increase in forecast opex associated with ActewAGL's safe work practices in our alternative opex forecast. We consider providing safe work practices is a business as usual expense. We account for the cost of meeting business as usual expenses through our estimate of base opex. This is consistent with our draft decision.

In its original proposal, ActewAGL proposed a step change of \$3.5 million for safe work practices.⁹⁵⁵ The step change was for a dedicated team of four people that would be responsible for updating, communicating and standardising electrical safety documentation across ActewAGL. ActewAGL stated this was necessary for

⁹⁵³ ACT legislation, *Electricity Network Assets Management Code*, August 2013.

⁹⁵⁴ ACT legislation, *Electricity Network Assets Management Code*, August 2013, section 5.5(3).

⁹⁵⁵ ActewAGL, *Revised regulatory proposal*, January 2015, p. 243-246.

maintaining ISO9001 certification, for ongoing compliance with the WHS Act 2011 and to be consistent with standard industry practice.⁹⁵⁶

ActewAGL also stated an independent audit in 2014 identified inadequate documentation management. This review identified a need to improve the alignment of the information contained in ActewAGL's electrical safety rule book with industry standards and the WHS Act 2011. It also identified the need to ensure ongoing compliance with the rule book as well as consistency with standard industry practice.⁹⁵⁷

In our draft decision, we did not include a safe work practices step change for an electrical safety documentation team. We stated that the ISO9001 certification and ongoing compliance with the WHS Act 2011 and the latest approved Code of Practice for Electrical Safety released in 2012–13 by the ACT Parliamentary Counsel were not new regulatory obligations.⁹⁵⁸

Further, we considered effective safety documentation management, ensuring compliance with the electrical rule book and consistency with standard industry practice were ordinary duties related to safety management that should always be exercised by a prudent network service provider.

In its revised proposal, ActewAGL stated under its technical and safety regulatory obligations, it must maintain electrical safety documentation that is consistent with current codes of practice and the WHS Act 2011. ActewAGL stated these new regulatory obligations could not be met with base opex. It did not provide any more information than in its original proposal.⁹⁵⁹

Specifically, ActewAGL did not address the fact that we did not consider the ISO9001 certification or the WHS Act 2011 to be new regulatory obligations. Nor did it address the fact that monitoring, updating, communicating and standardising electrical safety documentation across the business, to ensure all relevant employees and contractors comply with electrical safety requirements, is business as usual for a prudent service provider. Therefore, ActewAGL did not provide sufficient evidence to convince us to change our draft position on this issue. Our estimate of base opex already takes into account the efficient cost of meeting ActewAGL's existing regulatory obligations or requirements.

Contractor management

We have not included a contractor management step change in our alternative opex forecast. We consider contractor management costs are business as usual expenses and are therefore accounted for in our estimate of base opex. This is consistent with our draft decision.

⁹⁵⁶ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, pp. 21-23, 51-53.

⁹⁵⁷ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 21.

⁹⁵⁸ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-155.

⁹⁵⁹ ActewAGL, *Revised regulatory proposal*, January 2015, p. 244.

In its original proposal, ActewAGL proposed a step change of \$ 3.1 million for additional resources to manage contracts. It stated the proposed expenditure has primarily been driven by new obligations under the WHS Act 2011 which are required to be incorporated into its existing and new contracts. ActewAGL stated the WHS Act 2011 places more obligations and responsibility on it in the area of contractor management relative to the repealed ACT OHS legislation. It also stated it needed the step change to maintain OHSAS 18001:2007 certification.⁹⁶⁰

ActewAGL stated an employer's general duty of care is to provide systems of work that are, so far as is reasonably practicable, safe and without risks to health. Components of a system include:

- the organisation and co-ordination of the work of those involved
- training, instruction and supervision
- layout of plant and appliances
- methods to be used
- general conditions of work.⁹⁶¹

In our draft decision, we did not include a contractor management step change. This was because we were not satisfied that the WHS obligations placed on ActewAGL for contractor management had materially increased since 2012–13.⁹⁶²

We discuss the regulatory impact of the WHS Act 2011 in our assessment of the EHSQ step change above. In that assessment we conclude that:

- The WHS Act 2011 was the result of the national process of workplace harmonisation across Australia that was intended to reduce compliance costs. The regulatory impact statement confirmed that compliance costs did not increase.
- The WHS Act 2011 was not a new regulatory obligation.
- The WHS Act 2011 was not a very different regime to that which preceded it.
- ActewAGL's duty of care to contractors has not changed. Also, the requirement to complete a Safe Work Method Statement has not changed for either employers or principal contractors from those adopted under the Work Safety Act 2008.⁹⁶³

Regarding the duty of care and the components of an OHS management system ActewAGL listed above, we do not consider these are new obligations, but common elements of any good contractor management practice.

In its revised proposal, ActewAGL stated again that this step change is required for additional resources to manage contracts and has primarily been driven by new

⁹⁶⁰ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, pp. 24-26, 52-53.

⁹⁶¹ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 53.

⁹⁶² AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, pp. 7-155.

⁹⁶³ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-220.

obligation under the WHS Act 2011.⁹⁶⁴ It stated the WHS Act 2011 places more obligations specifically in the area of contractor management relative to the repealed ACT OHS legislation. It did not address our arguments in our draft decision that we do not consider the WHS Act is a new regulatory obligation.

ActewAGL also stated in its revised proposal that failure to adequately address safety concerns in respect of contractor management, particularly those issues relating to health and safety, may result in its OHSAS 18001:2007 certification being removed. We note that ActewAGL already has this certificate. It is not consistent with our forecasting approach to include a step change for a service provider to continue to comply with existing obligations.

Corporate services charges

We have not included a corporate services charges step change of \$17.0 million in our final decision. We consider the cost of corporate services is a business as usual expense which is therefore accounted for in our estimate of base opex. To the extent that business as usual expenses are expected to increase over the forecast period, we account for this through our estimate of the rate of change. No step change is necessary. This position is consistent with our draft decision.⁹⁶⁵

In its original proposal ActewAGL proposed a corporate services charges step change of \$10.1 million. It stated the step change was required to ensure the stability and reliability of the core systems and the potentially higher costs associated with the risks related to employee health and compliance management.⁹⁶⁶

In our draft decision, we did not include a corporate services charges step change in our alternative opex forecast. This was because it was not driven by a new regulatory obligation or some other change in ActewAGL's operating environment beyond its control.⁹⁶⁷

In its revised proposal, ActewAGL increased the cost of the step change from \$10.1 million to \$17.0 million.⁹⁶⁸ ActewAGL stated it increased the size of the corporate services step change to offset a reduction it made to corporate services charges in the base year. ActewAGL stated it reduced the amount of corporate services charges included in the base year to correct an error it had made in its original proposal. It offset the reduction in the base year by increasing the corporate services charges step change by an equivalent amount.

We have reassessed each of the proposed components of the corporate services step change separately:

⁹⁶⁴ ActewAGL, *Revised regulatory proposal*, January 2015, p. 245-246.

⁹⁶⁵ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, pp. 7-156-158.

⁹⁶⁶ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, pp.37-38.

⁹⁶⁷ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, pp. 7-156-158.

⁹⁶⁸ ActewAGL, *Revised regulatory proposal*, January 2015, p. 247.

- software license escalation
- core systems replacement program
- opex related to capex program
- corporate health strategy
- compliance management.

Software licence escalation

ActewAGL proposed this step change to fund a forecast cost escalation of seven per cent per annum for software licences from 2012–15, with escalation in line with CPI for the remainder of the 2014–19 period.

In our draft decision, we did not include a step change for software licence maintenance costs relating to corporate services. This is because we consider price increases for inputs such as software licences are accounted for in the rate of change we apply to our estimate of base opex.⁹⁶⁹

In its revised proposal, ActewAGL stated that when it applies a price change to its opex forecast it does not apply it to the corporate services charges component. Rather, the corporate services costs are forecast separately. They are considered as a standalone input because of the shared services model and separate divisional structure.⁹⁷⁰

Therefore, ActewAGL stated that applying real cost escalation for software licencing costs within this step change is appropriate and does not result in double counting.

When we develop our alternative opex forecast, unlike ActewAGL, we apply our rate of change to the whole base year including corporate costs. Therefore, we do not need to add a step change for software licence escalation separately as ActewAGL does. We discuss why the rate of change accounts for the price increase of all inputs in our rate of change appendix B.

Opex related to the core systems replacement program

ActewAGL stated it will incur incremental opex of \$0.5 million to support the implementation of the core systems replacement program (CSRP).⁹⁷¹

In our draft decision, we did not include a step change for support costs related to ActewAGL's CSRP program. This was because we considered the decision to implement this program was a discretionary business decision. We expect a prudent and efficient service provider would make efficient trade-offs between bearing these costs and achieving future efficiencies.⁹⁷²

⁹⁶⁹ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-157.

⁹⁷⁰ ActewAGL, *Revised regulatory proposal*, January 2015, p. 249.

⁹⁷¹ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p. 39.

⁹⁷² AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-230.

In its revised proposal, ActewAGL stated the incremental ongoing opex is for additional licence maintenance costs from 2014–15 onwards. These costs were not included in the base year as the legacy systems were unsupported and licencing models have changed with newer software available.⁹⁷³

As we explain above, our estimate of base opex already accounts for the efficient cost of providing network services. This includes costs associated with IT.

While the cost of particular programs and particular categories of opex varies from year to year, total opex typically is not lumpy. If expenditure for one project increases, it does not necessarily follow that a service provider requires additional funding. In this case, the amount of expenditure ActewAGL is requesting for additional licence maintenance costs is small compared to the base level of opex. We are not persuaded that ActewAGL needs additional funding for this cost driver.

Opex related to the core systems replacement program and capex IT programs

In its proposal, ActewAGL stated it will incur incremental opex of \$1.9 million to support its capital IT investments over the previous and current period.⁹⁷⁴

We have not included a step change for increased opex to maintain and support new information and communications technology (ICT) assets as part of the corporate services charges step change. This is consistent with our draft decision. We consider these costs are accounted for in base opex and IT investment should result in opex savings not opex increases.

ActewAGL stated in its revised proposal that this step change is required because our draft decision allowed for the ICT capital expenditure of \$29.7m in the 2014–19 period. It stated that given the extent of capex invested in ICT, it is reasonable to expect an associated increase in the level of opex to maintain and support these new ICT assets.⁹⁷⁵

We recognise that ActewAGL may need to replace systems and software as a result of investing in new ICT assets. However, we do not consider a step change in total opex reasonably follows in this case.

From time to time, replacement of systems and software may lead to higher opex. However, our role is to provide sufficient funding in total to achieve regulatory obligations. Where there is no new regulatory obligation, total opex must maintain the quality, reliability and security of supply.⁹⁷⁶ Therefore, when considering the cost of replacing software and systems, we expect the increase would reflect the cost to achieve the same level of quality, reliability and security of service. In isolation, there may be programs or projects that cost more from one year to the next. However, when

⁹⁷³ ActewAGL, *Revised regulatory proposal*, January 2015, p. 250.

⁹⁷⁴ ActewAGL, *Revised regulatory proposal*, January 2015, p. 248,250.

⁹⁷⁵ ActewAGL, *Revised regulatory proposal*, January 2015, p. 251.

⁹⁷⁶ NER, clause 6.5.6(a)(3)(iii).

forecasting opex, we do not aggregate the forecast cost associated with individual projects and projects, we forecast total opex. We are not convinced that the total opex of an efficient business in providing the same quality, reliability and security of service would be much different in the 2014–19 period than in the base year, 2012–13, once we have accounted for output, productivity and price changes.

Corporate health strategy

In its original proposal, ActewAGL stated it had implemented a revised corporate health strategy to improve and maintain staff wellbeing, health and safety.⁹⁷⁷ It stated it has a dedicated health strategy, which is borne from the legislative requirements under the *Work Health and Safety Act 2011*, *Safety Rehabilitation Compensation Act 1988* (Cth) and the *Workers Compensation Act 1951* (ACT) to protect the health and safety of all employees. It also stated the revised corporate health strategy was a significant step beyond its legislative obligation, where the accountability of staff welfare is part of everyday business.⁹⁷⁸

In our draft decision, we considered that none of the legislative requirements ActewAGL referenced for this step change were new obligations and the cost of complying with them should be reflected in our estimate of base opex.⁹⁷⁹

We have not included a step change for ActewAGL's health strategy in our alternative opex forecast because none of the legislations listed above are new. ActewAGL stated its health strategy is aimed at providing employees with a workplace committed to improving and maintaining staff wellbeing, health and safety. We consider this represents the normal duty of care of a prudent and efficient service provider towards its staff, as opposed to an incremental obligation. As such it will be accounted for in our estimate of base opex.

Compliance management

In its original proposal, ActewAGL stated that to facilitate compliance with an increasing number of legislative and regulatory obligations, it upgraded its legal obligations management systems (CMO) during the 2009–14 regulatory control period. The implementation included training across the whole business on how to use CMO.⁹⁸⁰

In our draft decision, we considered the ongoing costs of complying with legislative and regulatory obligations are business as usual for a service provider and are therefore accounted for in our estimate of base opex.⁹⁸¹

⁹⁷⁷ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, p.39.

⁹⁷⁸ ActewAGL, *Revised regulatory proposal*, January 2015, p. 251.

⁹⁷⁹ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-231.

⁹⁸⁰ ActewAGL, *Regulatory proposal, Attachment B10 Operating expenditure step changes 2014–19*, pp.38-39.

⁹⁸¹ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-231.

In its revised proposal, ActewAGL stated that opex required to efficiently manage its legal obligations has risen above the base year as a result of changing and increasing regulatory obligations and requirements. This has required a move from relying on SMEs to the CMO system.⁹⁸²

We are not satisfied that ActewAGL needs a step change above our estimate of base opex for this driver:

- We are not satisfied that the regulatory burden placed on ActewAGL in the 2014–19 period is materially greater than the regulatory burden placed on it in the 2009–14 regulatory control period.
- Compliance management is business as usual for a prudent and efficient service provider. Therefore, we consider these costs would be provided for in our estimate of base opex.
- We expect that a business would only invest in IT where the benefits of that investment are expected to outweigh the costs. The expectation of future benefits should be sufficient incentive to undertake this investment and no increase in opex is needed.

Allocation of corporate services charges

We have not included a negative step change in our alternative opex forecast for an allocation of corporate services charges step change. This is consistent with our draft decision. It is also consistent with our assessment of the corporate services charges step change above.

ActewAGL stated this negative step change of –\$1.2 million is due to annual variations in the amount of corporate services to be capitalised under the approved CAM.⁹⁸³ We have taken this into account in assessing ActewAGL's base year expenditure against the opex criteria in both our draft and final decisions.⁹⁸⁴ We have not specifically considered it as a step change.

Asset management optimisation

We have not included an asset management optimisation step change in our alternative opex forecast.

ActewAGL proposed a new step change in its revised revenue proposal of \$1.1 million for asset management optimisation.⁹⁸⁵ It stated that in its original proposal it applied a zero-based forecasting approach for maintenance and vegetation management expenditure. However, its revised proposal is to apply a base step trend approach for all expenditure, including maintenance and vegetation management. This step change

⁹⁸² ActewAGL, *Revised regulatory proposal*, January 2015, p. 251.

⁹⁸³ ActewAGL, *Revised regulatory proposal*, January 2015, p. 252.

⁹⁸⁴ AER, *ActewAGL Draft decision 2014–19, Attachment 7 Operating expenditure*, p. 7-37.

⁹⁸⁵ ActewAGL, *Revised regulatory proposal*, January 2015, p. 252.

adds back the shortfall between the base step trend forecast and the original zero based forecast to ActewAGL's opex forecast.

ActewAGL stated that

it is prudent to assess base year maintenance and vegetation management opex against its zero based forecasts to identify whether this produces annual forecasts that ensure life cycle costs are optimised and therefore reflect the efficient costs of achieving the opex objectives.⁹⁸⁶

ActewAGL considers a base step trend forecasting approach does not provide sufficient funding for its asset management program. Using the base step trend approach to forecast asset management and then adding a step change has the same impact on ActewAGL's total opex forecast as using a bottom up forecasting method for asset management.

In the Forecasting method appendix D we explain that using category specific forecasting methods for some categories produces a total opex forecast that is not consistent with the opex criteria. We recognise that a category specific forecasting method, such as the bottom up forecasting approach used ActewAGL, may produce a better forecast of expenditure for asset management. However, if this approach is only used for some categories this may not produce a better forecast of total opex. In particular, forecast total opex may systematically exceed the level of total opex that reflects the opex criteria if a category specific forecasting method is used to forecast some, but not all, opex categories.

ActewAGL stated it needs the asset management optimisation step change as a result of changes to the Management of Electricity Network Assets Code in 2013. The change requires it to have an asset management system consistent with PAS 55 Asset Management and ISO 55000 Asset Management. ActewAGL states this is not a regulatory requirement for any other distributor.

As discussed in our assessment of the technical standards step change, we are not satisfied that ActewAGL has demonstrated that the ISO 55000 standard imposes heavier technical obligations than its predecessor the PAS 55. The PAS 55 is a well-established standard that gives guidance and a checklist of good practices in physical asset management, like the ISO 55000. Even though ActewAGL is required to have an asset management plan that is consistent with ISO 55000, it does not necessarily follow that a prudent and efficient service provider is not already meeting that standard or needs a step up in opex to meet the new standard. For example Energy Safe Victoria (ESV) is the independent technical regulator responsible for electricity, gas and pipeline safety in Victoria. As part of this role, ESV annually reviews the safety performance of Victoria's major electricity businesses. In its 2013 review it found all of

⁹⁸⁶ ActewAGL, *Revised regulatory proposal*, January 2015, p. 252.

them had comprehensive electricity safety management schemes, many supplemented by other management systems and certification such as PAS 55.⁹⁸⁷

⁹⁸⁷ Energy Safe Victoria, *Safety Performance Report on Victorian Electricity Networks 2013*, p. 24.

D Forecasting method

This appendix sets out our consideration of ActewAGL's forecasting method in determining our alternative opex forecast for ActewAGL for the 2014–19 period.

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

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

D.1 Position

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

D.2 Draft position

We did not use category specific forecasting methods to separately forecast any of ActewAGL's opex categories other than debt raising costs in our alternative total opex forecast. We formed our alternative forecast total opex using our guideline forecasting method with all opex categories other than debt raising costs included in base opex.⁹⁸⁸

D.3 Revised proposal and submissions

ActewAGL raised two issues with our forecasting method in its revised regulatory proposal. ActewAGL:

⁹⁸⁸ AER, *Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013.

1. did not agree that an opex forecast could systematically exceed the level of opex that reflects the opex criteria if a category specific forecasting method is used to forecast opex categories
2. considered we determined our own opex forecast with little regard to its forecast.

ActewAGL also revised the opex forecasting method it used for its revised regulatory proposal.

We respond to these matters below.

D.3.1 Opex forecasting method assessment

Under our guideline forecasting method we start with the actual expenditure in a base year. If actual expenditure in the base year reasonably reflects the opex criteria we set base opex equal to actual expenditure. If not we apply an efficiency adjustment to ensure base opex reflects the opex criteria. We then apply a forecast rate of change to capture forecasting changes in prices, output and productivity. We then add or subtract any step changes to account for any other expenditure that reflects the opex criteria and which base opex or the rate of change do not capture.⁹⁸⁹

We outlined in our draft decision why it is best to use consistent forecasting methods for all cost categories of opex. This is because hybrid forecasting methods (that is, combining revealed cost and category specific methods) can produce biased opex forecasts inconsistent with the opex criteria. Using a category specific forecasting method for some opex categories may produce better forecasts of expenditure for those categories but this may not produce a better forecast of total opex. We discuss this in greater detail in our draft decision.⁹⁹⁰

Frontier Economics has expressed the same view:⁹⁹¹

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

We also stated that once a level of base opex that reflects the opex criteria is determined, forecast total opex will systematically exceed the level of opex that reflects the opex criteria if a category specific forecasting method is used to forecast opex categories:

- with low expenditure in the base year
- with a greater rate of change than total opex.⁹⁹²

⁹⁸⁹ AER, *Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, pp. 22–24.

⁹⁹⁰ AER, *Draft decision: ActewAGL distribution determination 2014–19*, Attachment 7, November 2014, pp. 160–161.

⁹⁹¹ Frontier Economics, *Opex forecasting and EBSS advice for the SP AusNet final decision*, January 2014, p. iii.

⁹⁹² AER, *Draft decision: ActewAGL distribution determination 2014–19*, Attachment 7, November 2014, p. 160.

ActewAGL did not agree with this. Rather, ActewAGL considered we should assess its opex forecast based on the costs required to achieve the opex objectives, which may or may not exceed the trended base opex forecast.⁹⁹³ ActewAGL's statements infer that our guideline forecasting method is overly simplistic and does not produce an opex forecast consistent with the opex criteria. However, they provide no reasons to support this. We consider our forecasting method gives an opex forecast consistent with the opex criteria for the reasons outlined in our draft decision.⁹⁹⁴

ActewAGL appears to suggest that our forecasting method does not account for year to year variations around the trend, particularly for maintenance expenditure. However, Frontier Economics, in a report for TransGrid, considered year to year variability in expenditure is not a reason to forecast a given category of expenditure separately. It also clarified when it thought it was appropriate to forecast a given category of expenditure separately.⁹⁹⁵

As explained in my previous report for the AER, I consider that all controllable opex should be forecast using a single base year-step-trend approach if total opex appears to be broadly stable from one RCP to the next. Conversely, a base-step-trend approach would not be appropriate if controllable opex exhibited a large degree of 'lumpiness' manifesting in secular shifts or long waves of increased expenditure. Therefore, I do not recommend—if a single year base-step-trend approach is used—examining the 'recurrence' of each category of controllable opex individually to determine whether it should be included in the base year for forecasting purposes or whether it should be forecast using a bottom-up approach.

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

These are not ActewAGL's circumstances and we see no reason to adopt category specific forecasts for any individual category of opex to forecast total opex, including maintenance expenditure.

As we stated in our draft decision, we make our assessment about the total opex forecast and not about particular categories or projects in the opex forecast. This is

⁹⁹³ ActewAGL, *Revised regulatory proposal*, January 2015, p. 255.

⁹⁹⁴ AER, *Draft decision: ActewAGL distribution determination 2014–19*, Attachment 7, November 2014, pp. 9–16.

⁹⁹⁵ Frontier Economics, *Opex forecasting method*, December 2014, pp. 7–8.

consistent with our requirements under the NER and has been highlighted by The Australian Energy Market Commission (AEMC):⁹⁹⁶

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

We recognised in our draft decision that category specific forecasting methods may produce better forecasts of expenditure for those categories. However, if they are only used for some categories this may not produce a better forecast of total opex.⁹⁹⁷ Hybrid forecasting methods run the risk of substituting increased accuracy for a subset of cost categories for reduced accuracy at the total opex level.

Two reasons often given for applying a category specific forecasting method to given category of expenditure are that:

3. the absolute level of expenditure in the base year for that category is not reflective of expenditure going forward
4. the rate of change for that category is not the same as the rate of change of total opex.

Given we are not required to forecast opex at the category level we see no reason to adopt category specific forecasting methods in these circumstances.

On the first proposed reason, the critical question is whether total base year opex reflects the opex criteria. Under our forecasting method our forecast of opex is a function of reported expenditure in the base year (2012–13).⁹⁹⁸ We use base opex to derive an estimate of final year (2013–14) opex. This estimate provides the level of total opex required in that year to reflect the opex criteria. At the category level opex will vary from year to year to some degree. The absolute level of expenditure in the base year for many categories may not reflect expenditure going forward. We could choose to apply a category specific forecasting method to an individual category of opex if the revealed level of opex does not reflect the opex criteria for that category. For example, base year expenditure may be low for a given category. However, if total opex does meet the opex criteria then opex for the remaining categories must be higher than that required to meet the opex criteria. Consequently, if we only apply a category specific forecasting method for a category with low expenditure in the base year then the total opex forecast will be greater than that required to meet the opex criteria. For this reason we focus on whether total opex in the base year reflects the opex criteria, not whether expenditure for individual categories do.

On the second proposed reason, the critical question is whether the rate of change of total opex reflects the opex criteria. The forecast rate of change captures the forecast

⁹⁹⁶ AEMC, *Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012*, 29 November 2012, p. vii.

⁹⁹⁷ AER, *Draft decision: Ausgrid distribution determination 2014–19*, Attachment 7, November 2014, p. 171.

⁹⁹⁸ AER, *Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, p. 22.

change in output, prices and productivity.⁹⁹⁹ The forecast rate of change is the rate of change of total opex (excluding debt raising costs, which we discuss in the rate of return attachment). We could choose to apply a category specific forecasting method to an individual category of opex because the total opex rate of change doesn't reflect the forecast change for that category. For example, expenditure for a given category may rise faster than total opex. However, if the rate of change of total opex meets the opex criteria then expenditure for the remaining categories must rise slower than total opex. Consequently, if we only apply a category specific forecasting method for the category with a higher rate of change then the total opex forecast will be greater than that required to meet the opex criteria. For this reason we focus on whether the rate of change of total opex reflects the opex criteria, not whether the rate of change for individual categories do.

D.3.2 The role of our forecasting method in our assessment approach

ActewAGL stated we determined our own opex forecast with little regard to its forecast. It considered that we committed a reviewable error by doing so. It considered we did not provide any basis for rejecting its forecasting method.¹⁰⁰⁰

However, ActewAGL's claims misrepresent our assessment approach and how we determined our alternative estimate of opex. We did have regard to ActewAGL's forecasting methodology in our draft decision. We used our guideline forecasting method to derive our alternative estimate having regard to ActewAGL's regulatory proposal and all other material and submissions before us. We then compared our alternative estimate of opex with ActewAGL's proposed amount. We sought to identify all differences in both our forecasting method and the inputs and assumptions used. We then considered whether adopting the methods and the inputs and assumptions used by ActewAGL would produce an opex forecast that better met the opex criteria, having regard to the opex factors. We provided reasons in our draft decision why adopting ActewAGL's forecasting method would not produce an opex forecast that better reflected the opex criteria.

Even when we do adopt a different forecasting method to a distributor this does not necessarily mean we will not be satisfied its forecast reasonably reflects the opex criteria. Difference in forecasting methods may not drive material differences in the opex forecasts. In this case, if all other inputs and assumptions adopted by the distributor are reasonable, then our alternative estimate will show the distributor's forecast to reasonably reflect the opex criteria.

For our draft decision, this assessment approach identified the efficiency of revealed expenditure and step changes as the key drivers of the difference between our

⁹⁹⁹ AER, *Expenditure Forecast Assessment Guideline for Electricity Distribution*, November 2013, p. 23.

¹⁰⁰⁰ ActewAGL, *Revised regulatory proposal*, January 2015, pp. 255–256.

alternative estimate and ActewAGL's opex proposal. ActewAGL's forecasting method was not a key driver of the difference.

D.3.3 Revisions to ActewAGL's forecasting method

Despite the concerns it raised, ActewAGL stated it adopted the AER's preferred forecasting method. Accordingly, ActewAGL's revised proposal used a 'base year (base-step-trend) approach' to forecast all opex categories. It cited two reasons for this change in approach.

First, ActewAGL maintained that a revealed cost approach is preferable and consistent with the incentive based regulatory framework, and noted that the use of revealed base year expenditure is integral to the function of the EBSS.¹⁰⁰¹

Secondly, ActewAGL contended that use of a base step trend approach for all opex forecasting provided a more transparent review process, where any variations from the base year that are not captured in the rate of change are addressed through step changes. ActewAGL expected this approach should contribute to greater consistency in regulatory decision making in future regulatory control periods.¹⁰⁰²

ActewAGL changed its forecasting method by removing the category specific forecast for maintenance expenditure and adding a forecast of output growth. It included an allowance for output growth based on new asset maintenance costs.¹⁰⁰³ We assess ActewAGL's output growth forecast in our assessment of the rate of change.

¹⁰⁰¹ ActewAGL, *Revised regulatory proposal*, January 2015, p. 256.

¹⁰⁰² ActewAGL, *Revised regulatory proposal*, January 2015, p. 256.

¹⁰⁰³ ActewAGL, *Revised regulatory proposal*, January 2015, p. 215.