



FINAL DECISION
Endeavour Energy distribution
determination
2015–16 to 2018–19

Attachment 6 – Capital
expenditure

April 2015

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Note

This attachment forms part of the AER's final decision on Endeavour Energy'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

Attachment 14 - Control mechanism

Attachment 15 - Pass through events

Attachment 16 - Alternative control services

Attachment 17 - Negotiated services framework and criteria

Attachment 18 - Connection policy

Attachment 19 - Analysis of financial viability

Contents

Note	6-2
Contents	6-3
Shortened forms	6-6
6 Capital expenditure	6-8
6.1 Final decision	6-8
6.2 Endeavour Energy’s revised proposal	6-10
6.3 Assessment approach	6-11
Expenditure Assessment Guidelines.....	6-14
6.3.1 Building an alternative estimate of total forecast capex	6-15
6.3.2 Comparing the service provider's proposal with our alternative estimate	6-17
6.4 Reasons for final decision	6-19
6.4.1 Key assumptions.....	6-20
6.4.2 Forecasting methodology	6-20
6.4.3 Interaction with the STPIS.....	6-23
6.4.4 Endeavour Energy's capex performance.....	6-24
6.4.5 Interrelationships.....	6-33
6.4.6 Capex factors.....	6-34
6.5 Clarification of numerical differences	6-35
A Assessment techniques	6-38
A.1 Economic benchmarking	6-38
A.2 Trend analysis	6-39
A.3 Category analysis	6-40
A.4 Predictive modelling	6-40
A.5 Engineering review	6-41

B	Assessment of forecast capex drivers	6-44
	B.6 Alternative estimate.....	6-44
	B.7 AER findings and estimates for augmentation expenditure	6-45
	B.7.1 Position	6-45
	B.7.2 Revised proposal	6-46
	B.7.3 AER approach.....	6-48
	B.7.4 AER augex findings.....	6-50
	B.8 AER findings and estimates for connections and contributions..	6-53
	B.8.1 Position	6-53
	B.9 AER findings and estimates of replacement expenditure	6-54
	B.9.1 Position	6-54
	B.9.2 Revised proposal	6-54
	B.9.3 AER approach.....	6-56
	B.9.4 AER repex findings	6-57
	Predictive modelling.....	6-57
	Un-modelled repex	6-57
	B.10 AER findings and estimates of reliability improvement capex	6-59
	B.10.1 Position	6-59
	B.11 AER findings and estimates for capitalised overheads	6-60
	B.11.1 Position	6-60
	B.11.2 Revised proposal	6-60
	B.11.3 AER approach.....	6-61
	B.12 AER findings and estimates for non-network capex	6-62
	B.13 AER findings and estimates for other system assets	6-63
	B.13.1 AER findings and estimates for Other System Assets	6-63
	Technology efficiency expenditure	6-64

B.14	Demand management	6-64
B.14.1	Position	6-65
B.14.2	Revised proposal on demand management	6-65
B.14.3	Draft decision position	6-66
B.14.4	Reasons for final decision	6-66
C	Demand	6-68
C.1	AER position	6-68
C.2	AER approach	6-68
C.3	Endeavour Energy's revised proposal	6-69
C.3.1	AEMO forecasts	6-70

Shortened forms

Shortened form	Extended form
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
augex	augmentation expenditure
capex	capital expenditure
CCP	Consumer Challenge Panel
CESS	capital expenditure sharing scheme
CPI	consumer price index
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
NNSW	Networks NSW
NSP	network service provider
opex	operating expenditure
PPI	partial performance indicators
PTRM	post-tax revenue model
RAB	regulatory asset base
RBA	Reserve Bank of Australia
repex	replacement expenditure

Shortened form	Extended form
RFM	roll forward model
RIN	regulatory information notice
RPP	revenue and 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
VCR	value of customer reliability
WACC	weighted average cost of capital

6 Capital expenditure

Capital expenditure (capex) refers to the capital expenses incurred in the provision of standard control services. The return on and of forecast capex are two of the building blocks that form part of Endeavour Energy's total revenue requirement.¹

This Attachment sets out our final decision on Endeavour Energy's proposed total forecast capex. Further detailed analysis is in the following appendices:

- Appendix A - Assessment Techniques
- Appendix B - Assessment of capex drivers
- Appendix C - Demand

6.1 Final decision

We are satisfied that Endeavour Energy's proposed total forecast capex of \$1595.8 million (\$2013–14) reasonably reflects the capex criteria. We constructed an alternative estimate of the total forecast capex and we assessed the margin of difference between our alternative estimate and Endeavour Energy's proposed forecast. We consider the difference between the two estimates is not material. Table 6-1 outlines our draft decision.

Table 6-1 Our final decision on Endeavour Energy's total forecast capex (million \$2013–14)

	2014–15	2015–16	2016–17	2017–18	2018–19	Total
Endeavour Energy's revised proposal	416.2	341.7	290.2	280.5	267.3	1595.8
AER final decision	416.2	341.7	290.2	280.5	267.3	1595.8
Difference	0.0	0.0	0.0	0.0	0.0	0.0
Percentage difference (%)	0.0	0.0	0.0	0.0	0.0	0.0

Source: Endeavour Energy Regulatory Proposal as expanded upon in email, Endeavour Energy to AER 24 February 2015; AER analysis

Note: Numbers may not add up due to rounding.

A summary of our reasons and findings that we present in this Attachment and Appendix B are set out in Table 6-2.

These reasons include our responses to stakeholders' submissions on Endeavour Energy's revised regulatory proposal. In the table we present our reasons largely by

¹ NER, clause 6.4.3(a).

‘capex driver’ such as augex and repex. This reflects the way in which we tested Endeavour Energy’s proposed total forecast capex. Our testing used techniques tailored to the different capex drivers taking into account the best available evidence. Compared to our alternative estimate, at the aggregate level, our techniques revealed that the level of total forecast capex proposed by Endeavour Energy is consistent with the NER requirements in that it reasonably reflects the efficient costs of a prudent operator as well as a realistic expectation of the demand forecasts and cost inputs required to achieve the capex objectives.

Our findings on the capex associated with specific capex drivers are part of our broader analysis and are not intended to be considered in isolation. Our final decision concerns Endeavour Energy’s total forecast capex for the 2014-19 period. We do not approve an amount of forecast expenditure for each capex driver.

Table 6-2 Summary of AER reasons and findings

Issue	Reasons and findings
Forecasting methodology, key assumptions and past capex performance	<p>We conclude that Endeavour Energy’s forecasting methodology predominately relies upon a bottom-up build (or bottom-up assessment) to estimate the forecast expenditure and that the top-down constraints imposed by their governance process are insufficient for us to be able to conclude that the forecasts are prudent and efficient. Bottom up approaches have a tendency to overstate required allowances as they do not adequately account for inter-relationships and synergies between projects or areas of work. In the absence of a strong top-down challenge of the aggregated total of bottom-up projects, simply aggregating such estimates is unlikely to result in a total forecast capex allowance that we are satisfied reasonably reflects the capex criteria.</p> <p>However, having constructed an alternative estimate of Endeavour Energy’s total forecast capex, we do not consider that there is a material difference between our alternative estimate and Endeavour Energy’s proposed total forecast capex.</p>
Augmentation capex	<p>We accept Endeavour Energy’s revised proposal augex forecast of \$282.8 million (\$2013-14). We are satisfied that Endeavour has addressed the substantive issues we raised in our draft decision. While Endeavour’s forecast is higher than our draft decision alternative estimate, Endeavour has proposed reductions from its initial proposal that are within the efficient range we proposed in the draft decision.</p>
Customer connections capex	<p>We accept Endeavour Energy’s \$77.2 million proposed connections capex forecast and \$407.5 million (\$2013-14) proposed customer contributions forecast. We maintain our position from the draft decision that this expenditure is consistent with forecast construction activity in NSW.</p>
Asset replacement capex (repex)	<p>We accept Endeavour Energy’s revised proposed repex. We have included in our alternative estimate of overall total capex, an amount of \$664.5 million (\$2013-14) for repex, excluding overheads. We are satisfied that this amount reasonably reflects the capex criteria.</p>
Reliability improvement capex	<p>We accept Endeavour Energy’s revised proposal in respect of the forecast reliability capex of \$24.4 million (\$2013-14) in reliability improvement capex. This is a 52% reduction from the proposed allowance of \$54.8 million in its initial proposal. Endeavour supplied additional information and we are satisfied that this expenditure is not already covered by our repex assessment or funded through the STPIS.</p>
Non-network capex	<p>We accept Endeavour Energy’s revised non-network capex forecast of \$163.6 million (\$2013-14). Endeavour Energy accepted our draft decision to reduce forecast capex for both the buildings and property and plant and equipment categories of non-network capex. This reflects Endeavour Energy’s actual and forecast reductions in staff numbers for the 2014–2019 period.</p>

Capitalised overheads	We included in our alternative estimate Endeavour Energy's proposed capitalised overheads of \$360.6 million (\$2013-14). This level of overheads reflects our acceptance of Endeavour Energy's direct costs.
Real cost escalators	Endeavour Energy accepted our approach to labour cost escalation (leading to increases above the CPI) set out in our draft decision. We have applied this approach (refer to Attachment 7) and the updated escalators resulted in an outcome similar to Endeavour Energy's revised proposal.
Adjustments and unaccounted for capex	We did not include in our alternative estimate Endeavour Energy's revised proposal of \$17.4 million (\$2013-14) for technology efficiency capex. Our estimate includes \$10.5 million (\$2013-14) for this category of expenditure. However, our findings on this proposed technology expenditure does not impact upon our conclusion at the aggregate level, that Endeavour Energy's proposed total forecast capex reasonably reflects the capex criteria.

Source: AER analysis

We consider that our overall capex forecast addresses the revenue and pricing principles. In particular, we consider that Endeavour Energy has been provided a reasonable opportunity to recover at least the efficient costs it incurs in:²

- providing direct control network services
- complying with its regulatory obligations and requirements.

As set out in appendix B we are satisfied that our overall capex forecast is consistent with the NEO in that our decision promotes efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity. Further, in making our final decision, we have specifically considered the impact our decision will have on the safety and reliability of Endeavour Energy's network. We consider this capex forecast is sufficient in that a prudent and efficient service provider in Endeavour Energy's circumstances will be able to maintain the safety, service quality, security and reliability of its network consistent with its current obligations.

6.2 Endeavour Energy's revised proposal

Endeavour Energy revised proposal was for total forecast capex of \$1595.8 million (\$2013–14) for the 2014–2019 period. This is 49 per cent higher than our draft decision, and 9 per cent lower than Endeavour Energy's initial regulatory proposal.

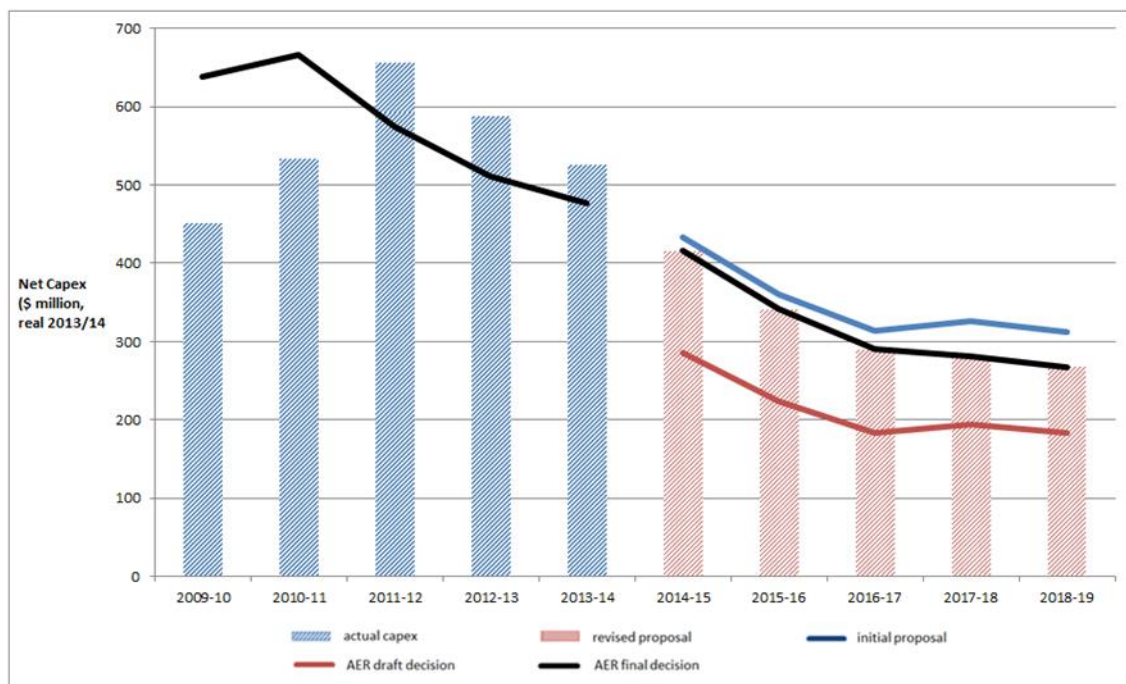
Figure 6-1 shows the difference between Endeavour Energy's initial proposal period, its revised proposal and our draft decision for the 2014–2019 period, as well as the actual capex that Endeavour Energy spent during the 2009–2014 regulatory control period. Endeavour Energy submits the reasons for the reduction between its initial and revised proposal are due to:³

² NEL, sections 7A

³ Endeavour, Revised Regulatory Proposal, p.91

- a revised capital program scope for the 2015-16 to 2018-19 period reflecting agreed aspects of the AER's draft determination and Endeavour Energy's revised risk assessed program
- the progressive implementation of further efficiencies in the delivery of the capital program by an average of 3.3 per cent per annum compounding over the four year period of 2015-16 to 2018-19 while maintaining the scope of the program submitted in this revised proposal.

Figure 6-1 Endeavour Energy's total actual and forecast capex 2009–2019



Source: AER analysis

A reconciliation between our draft decision and Endeavour Energy's revised proposal is shown in section 6.5.

6.3 Assessment approach

This section outlines our approach to capex assessments. It sets out the relevant legislative and rule requirements, outlines our assessment techniques, and explains how we build an alternative estimate of total forecast capex against which we compare that proposed by the service provider. The starting point of our assessment is the information provided by the distributor in its revised proposal. At the same time as Endeavour Energy submitted its proposal, it also submitted its response to our RIN. We have also sought further clarification from Endeavour Energy of some aspects of its revised proposal through information requests.

Our assessment approach involves two key steps:

- First, our starting point for building an alternative estimate is Endeavour Energy's revised proposal.⁴ We apply our various assessment techniques, both qualitative and quantitative, to assess the different elements of Endeavour Energy's proposal at the total level and at the capex driver level such as its proposed augmentation expenditure and replacement expenditure. This analysis not only informs our view on whether Endeavour Energy's proposal reasonably reflects the capex criteria set out in the NER⁵ but it also provides us with an alternative forecast that does meet the criteria. In arriving at our alternative estimate, we have had to weight the various techniques used in our assessment.
- Second, having established our alternative estimate of the *total* forecast capex, we can test the service provider's proposed total forecast capex. This includes comparing our alternative estimate total with the service provider's proposal total. If there is a difference between the two, we may need to exercise our judgement as to what is a reasonable margin of difference.

If we are satisfied that the service provider's proposal reasonably reflects the capex criteria, we accept it. If we are not satisfied, the NER require us to put in place a substitute estimate which we are satisfied reasonably reflects the capex criteria. Where we have done this, our substitute estimate is based on our alternative estimate.

The capex criteria are:

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

The AEMC noted that '[t]hese criteria broadly reflect the NEO [National Electricity Objective]'.⁶ The capital expenditure objectives (capex objectives) referred to in the capex criteria, are to:⁷

- meet or manage the expected demand for standard control services over the period
- comply with all regulatory obligations or requirements associated with the provision of standard control services

⁴ AER, Expenditure Forecast Electricity Distribution Guideline, November 2013, p. 9; see also AEMC, Economic Regulation Final Rule Determination, pp. 111 and 112.

⁵ NER, cl. 6.5.7(c).

⁶ AEMC Final Rule Determination: National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, 29 November 2012, p. 113 (AEMC Economic Regulation Final Rule Determination).

⁷ NER, cl. 6.5.7(a)

- to the extent that there are no such obligations or requirements, maintain service quality, reliability and security of supply of standard control services and maintain the reliability and security of the distribution system
- maintain the safety of the distribution system through the supply of standard control services.

Importantly, our assessment is about the total forecast capex and not about particular categories or projects in the capex forecast. The AEMC has described our role in these terms:⁸

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

In deciding whether we are satisfied that Endeavour Energy's proposed total forecast capex reasonably reflects the capex criteria, we have regard to the capex factors. The capex factors are:⁹

- the AER's most recent annual benchmarking report and benchmark capex that would be incurred by an efficient distribution network service provider (distributor) over the relevant regulatory control period
- the actual and expected capex of the distributor during the preceding regulatory control periods
- the extent to which the capex forecast includes expenditure to address the concerns of electricity consumers as identified by the distributor 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 capex forecast is consistent with any incentive scheme or schemes that apply to the distributor
- the extent to which the capex forecast is referable to arrangements with a person other than the distributor that, in the opinion of the AER, do not reflect arm's length terms
- whether the capex forecast includes an amount relating to a project that should more appropriately be included as a contingent project
- the extent to which the distributor has considered, and made provision for, efficient and prudent non-network alternatives.
- In addition, the AER may notify the distributor in writing, prior to the submission of its revised regulatory proposal, of any other factor it considers relevant.¹⁰ We have not notified Endeavour Energy of any additional factors.

⁸ AEMC Economic Regulation Final Rule Determination, p. vii.

⁹ NER, cl. 6.5.7(e).

In taking these factors into account, the AEMC has noted that:¹¹

...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.

For transparency and ease of reference, we have included a summary of how we have had regard to each of the capex factors in our assessment at the end of this attachment. More broadly, we also note that in exercising our discretion, we take into account the revenue and pricing principles which are set out in the NEL.

Expenditure Assessment Guideline

The rule changes the AEMC made in November 2012 require us to make and publish an Expenditure Forecast Assessment Guideline for Electricity Distribution, released in November 2013 (Expenditure Guideline).¹² We undertook extensive consultation with stakeholders in the preparation of the Expenditure Guideline. The Expenditure Guideline sets out the AER's proposed general approach to assessing capex (and opex) forecasts. The rule changes also require us to set out our approach to assessing capex in the relevant framework and approach paper. For Endeavour Energy, our framework and approach paper (published in January 2014) stated that we would apply the guideline, including the assessment techniques outlined in it.¹³ We may depart from our Expenditure Guideline approach and if we do so, we need to explain why. In this determination we have not departed from the approach set out in our Expenditure Guideline.

We note that in response to our draft decision, Endeavour Energy submitted that we had not demonstrated that we had assessed its initial proposal.¹⁴ We have in this final decision more clearly set out our engagement with the information Endeavour Energy has included in its revised proposal including the reports submitted from its consultants. Endeavour Energy further submitted that for our draft decision we had begun our inquiry by reviewing the RIN data and not the initial proposal though Endeavour Energy accepts that the RIN reconciles at the total level to its proposal.

Endeavour Energy also provided an audit report by PWC indicating that care needs to be taken in using RIN data.¹⁵ We note that the RIN data forms part of a distributor's regulatory proposal.¹⁶ In our Expenditure Guideline we set out that we would "require all the data that facilitate the application of our assessment approach and assessment techniques" and the RIN we issued in advance of a service provider lodging its

¹⁰ NER, clause 6.5.7(e)(12).

¹¹ AEMC Economic Regulation Final Rule Determination, p. 115.

¹² AEMC, Economic Regulation Final Rule Determination, p. 114 and AER Expenditure Forecast Electricity Distribution Guideline.

¹³ AER, Framework and approach paper, p.35

¹⁴ Endeavour, Revised Regulatory Proposal, p.110

¹⁵ Endeavour Energy - 1.05 PWC - Appropriateness of RIN data - January 2015

¹⁶ NER, clause 6.8.2(c2) and (d).

regulatory proposal would specify the exact information required.¹⁷ Accordingly, we consider that our intention to materially rely upon the RIN data was made clear as part of the Expenditure Guideline. However, we do acknowledge that the differences between Endeavour Energy's initial proposal and the RIN created differences of understanding between us and Endeavour Energy on the figures underlying the overall capex total. We have reconciled these numerical differences in section 6.5 of this Attachment and consider our final decision is made on an appropriate basis.

6.3.1 Building an alternative estimate of total forecast capex

Our starting point for building an alternative estimate is Endeavour Energy's revised proposal.¹⁸ We then considered its performance in the previous regulatory control period to inform our alternative estimate. We also reviewed the proposed forecast methodology and the service provider's reliance on key assumptions that underlie its forecast. Endeavour Energy has submitted further information on its forecast methodology in its revised proposal and we have addressed this below.¹⁹

We have maintained in our final decision the use of the specific techniques that we used in our draft decision. Many of our techniques encompass the capex factors that we are required to take into account. Further detail on each of these techniques is included in Appendix A and Appendix B.

Some of these techniques focus on total capex; others focus on high level, standardised sub-categories of capex. Importantly, the techniques that focus on sub-categories are not conducted for the purpose of determining at a detailed level what projects or programs of work the service provider should or should not undertake. They are but one means of assessing the overall total forecast capex required by the service provider. This is consistent with the regulatory framework and the AEMC's statement that the AER does not approve specific projects but rather an overall revenue requirement that included total capex forecast.²⁰ Once we approve total revenue, which will be determined by reference to our analysis of the proposed capex, the service provider is then able to prioritise its capex program given the prevailing circumstances at the time (such as demand and economic conditions that impact during the regulatory period). Some projects or programs of work that were not anticipated may be required. Equally likely, some of the projects or programs of work that the service provider has proposed for the regulatory control period may not ultimately be required in the regulatory period. We consider that a prudent and efficient service provider would consider the changing environment throughout the regulatory period and make sound decisions taking into account their individual circumstances.

¹⁷ AER, Expenditure Forecast Electricity Distribution Guideline, p. 25.

¹⁸ AER Expenditure Forecast Electricity Distribution Guideline, p. 9; see also AEMC Economic Regulation Final Rule Determination, pp. 111 and 112.

¹⁹ Endeavour Energy, Attachment 1.13 Final Jacobs - System capex and maintenance prudency assessment

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

As explained in our Guidelines:

Our assessment techniques may complement each other in terms of the information they provide. This holistic approach gives us the ability to use all of these techniques, and refine them over time. The extent to which we use each technique will vary depending on the expenditure proposal we are assessing, but we intend to consider the inter-connections between our assessment techniques when determining total capex ... forecasts. We typically would not infer the findings of an assessment technique in isolation from other techniques.²¹

In arriving at our estimate, we have had to weight the various techniques used in our assessment. How we weight these techniques will be determined on a case by case basis using our judgement as to which techniques are more robust, in the particular circumstances of each assessment. By relying on a number of techniques and weighting as relevant, we ensure we can take into consideration a wide variety of information and can take a holistic approach to assessing the proposed capex forecast. We have clarified to what extent we rely on each when assessing expenditure under the different capex drivers in response to Endeavour Energy's submissions that we had given inappropriate weighting to certain techniques.²²

Where our techniques involve the use of a consultant, to the extent that we accept our consultants' findings, we have set this out clearly in this final decision and they form part of our reasons for arriving at our final decision on overall capex. Endeavour Energy submitted that we erred in relying on consultant reports without properly forming our own view on the issues raised.²³ However, in all cases where we have relied on the findings of our consultants, we have done so only after carefully reviewing their analysis and conclusions, and evaluating these in the light of the outcomes from our other techniques and our examination of the distributor's proposal.

We also need to take into account the various interrelationships between the total forecast capex and other components of a service provider's distribution determination. The other components that directly affect the total forecast capex are forecast opex, forecast demand, the service target performance incentive scheme, the capital expenditure sharing scheme, real cost escalation and contingent projects. We discuss how these components impact the total forecast capex in Table 6-4.

Underlying our approach are two general assumptions:

- The capex criteria relating to a prudent operator and efficient costs are complementary such that prudent and efficient expenditure reflects the lowest long-

²¹ AER Expenditure Forecast Electricity Distribution Guideline, p. 12.

²² Endeavour, Revised Regulatory Proposal, p.108

²³ Endeavour, Revised Regulatory Proposal, p 123 - referencing Australian Competition Tribunal, Application by EnergyAustralia and Others [2009] ACompT 8 File No2 of 2009, page 64

term cost to consumers for the most appropriate investment or activity required to achieve the expenditure objectives.²⁴

- Past expenditure was sufficient for Endeavour Energy to manage and operate its network in that previous period, in a manner that achieved the capex objectives.²⁵

After applying the above approach, we arrive at our alternative estimate of the total capex forecast.

6.3.2 Comparing the service provider's proposal with our alternative estimate

Having established our alternative estimate of the total forecast capex, we can test the service provider's proposed total forecast capex. This includes comparing our alternative estimate with the service provider's proposal. The service provider's forecast methodology and its key assumptions may explain any differences between our alternative estimate and its proposal.

As the AEMC foreshadowed, we may need to exercise our judgement in determining whether any 'margin of difference' is reasonable:²⁶

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.

We have not relied solely on any one technique to assist us in forming a view as to whether we are satisfied that a service provider's proposed forecast capex reasonably reflects the capex criteria. We have drawn on a range of techniques as well as our assessment of other elements that impact upon capex such as demand and real cost escalators.

Our decision concerns Endeavour Energy's total forecast capex and we are not approving specific projects. It is important to recognise that the service provider is not precluded from undertaking unexpected capex works, if the need arises, and despite

²⁴ AER Expenditure Forecast Electricity Distribution Guideline, pp. 8 and 9. AER Expenditure Forecast Electricity Distribution Guideline, pp. 8 and 9. The Tribunal has previously endorsed this approach: see : 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)

²⁵ AER Expenditure Forecast Electricity Distribution Guideline, p. 9.

²⁶ AEMC Economic Regulation Final Rule Determination, p. 112.

the fact that such works did not form part our assessment in this determination. We consider that a prudent and efficient service provider would consider the changing environment throughout the regulatory period and make sound decisions taking into account their individual circumstances to address any unanticipated issues. Our provision of a total capex forecast does not constrain a service provider's actual spending – either as a cap or as a requirement that the forecast be spent on specific projects or activities. It is conceivable that a service provider might wish to expend particular capital expenditure differently or in excess of the total capex forecast set out in our this decision. Our decision does not constrain it from doing so.

The regulatory framework has a number of mechanisms to deal with unanticipated expenditure needs. Importantly, where unexpected events leads to an overspend of the approved capex forecast, a service provider does not bear the full cost, but rather bears 30 per cent of this cost, if the expenditure is found to be prudent and efficient. Further, for significant unexpected capex, the pass-through provisions provide a means for a service provider to pass on such expenses to customers where appropriate.

This does not mean that we have set our alternative estimate below the level where Endeavour Energy has a reasonable chance to recover its efficient costs. Rather, we note that Endeavour Energy is able to respond to any unanticipated issues that arise during the 2014–19 period and in the event that the approved total revenue underestimates the total capex required, Endeavour Energy has significant flexibility to allow it to meet its safety and reliability obligations.

Conversely, if we overestimate the amount of capex required, the stronger incentives put in place by the AEMC in 2012 should lead to a distributor spending only what is efficient, with the benefits of the underspend being shared between the distributor and consumers.

Further to the 2012 rule change, the AEMC in a 2013 rule change amended the expenditure objectives. This addressed the problem that the previous expenditure objectives relating to reliability, security and quality of supply:

...could be interpreted so that the expenditure an NSP includes in its regulatory proposal is to be based on maintaining the NSP's existing levels of reliability, security or quality, even where an NSP is performing above the required standards for these measures, or where required standards for those measures are lowered.²⁷

Consequently, where standards have been lowered for reliability or security and supply, the expenditure objectives now clarify that the relevant standards are those standards in place at the time of our determination and not any previous standards. We consider the implementation of the STPIS in a practical sense requires us to fund

²⁷ AEMC, Final Rule Determination, National Electricity Amendment (Network Service Provider Expenditure Objectives) Rule 2013 No. 5, p. ii.

Endeavour Energy to maintain its average level of reliability commensurate with the STPIS targets. We note that this level of performance is higher than the minimum standards Endeavour Energy is required to achieve under its licence obligations.

6.4 Reasons for final decision

We applied the assessment approach set out in section 6.3 to Endeavour Energy. We are satisfied that Endeavour Energy's total forecast capex reasonably reflects the capex criteria. We compared Endeavour Energy's capex forecast to our capex forecast we constructed using the approach and techniques outlined in appendix A and B. Endeavour Energy's proposal is materially similar to our alternative estimate. We are satisfied that Endeavour Energy's total forecast capex reflects the capex criteria. Table 6-3 sets out the capex amounts by capex driver that we have included in our alternative estimate of Endeavour Energy's total forecast capex for the 2014–2019 period.

Table 6-3 Our assessment of required capex by capex driver (\$ million 2013–14)

Category	2014-15	2015-16	2016-17	2017-18	2018-19	Total
Augmentation	93.4	53.4	43.2	54.4	38.4	282.8
Connections	14.8	15.6	15.5	15.6	15.7	77.2
Replacement	173.6	168.2	124.9	102.0	95.8	664.5
Reliability improvement	4.6	4.8	5.0	5.1	5.3	24.7
Other System Assets	0.5	3.0	3.5	3.5	9.8	20.4
Non-Network	49.7	27.7	28.9	29.0	30.5	165.7
Capitalised overheads	79.5	69.0	69.2	71.0	71.9	360.6
NET CAPEX (excludes capcons)	416.2	341.7	290.2	280.5	267.3	1595.8
capcons	90.3	79.3	79.3	79.3	79.3	407.5
TOTAL GROSS CAPEX (includes capcons)	506.5	421.0	369.5	359.8	346.6	2003.4

Source: AER analysis

Note: Numbers may not add up due to rounding.

Our assessment of Endeavour Energy's forecasting methodology, key assumptions and past capex performance are discussed in the section below.

In relation to past performance, we specifically consider the impact on expenditure of past licence conditions for reliability and network design and planning standards, and the removal of those conditions as of 1 July 2014. Our assessment of capex drivers is in Appendix B. This sets out the application of our assessment techniques to the capex drivers, and the weighting we gave to particular techniques. We used our reasoning in the appendices to form our alternative estimate.

6.4.1 Key assumptions

The NER require Endeavour Energy to include in its regulatory proposal the key assumptions that underlie its proposed forecast capex and a certification by its directors that those key assumptions are reasonable.²⁸ Endeavour Energy's key assumptions are set out in its regulatory proposal.²⁹

We have assessed Endeavour Energy's key assumptions in the appendices to this capex attachment.

In addition, we have some specific concerns about Endeavour Energy's key assumption about its legal and organisational structure. Endeavour Energy submits that its "current ownership and legal structure [does] not incorporate any impacts associated with a potential change of ownership ... [and] this is a reasonable assumption basis given that there has been no formal announcement by the current owner that a sale of the company will proceed in the 2014–19 period".³⁰ This appears to imply that a change in ownership, if it were to occur, would affect the amount of forecast capex that would be required to achieve the capex objectives. In our view, this is not the case and there is no logical basis for this assumption.

6.4.2 Forecasting methodology

Endeavour Energy is required to inform us about the methodology it proposes to use to prepare its forecast capex allowance before it submits its regulatory proposal.³¹ It is also required to include this information in its regulatory proposal.³² The main points of Endeavour Energy's forecasting methodology are set out in their regulatory proposal.³³ In its revised proposal Endeavour Energy also noted that they consider their forecasting process involves both top down and bottom up methods. They consider the following top-down approaches are incorporated into their forecasting methodology:³⁴

- the AER's repex and augex models
- The Value Development Algorithm (VDA)
- Weighted average remaining life
- their understanding of proposed developments gained from developers and planning authorities, and the use of probabilistic/risk-based capacity planning to identify and manage resultant constraints
- this is then overlaid with the risk prioritisation approach considered by the Board for the overall capex program.

²⁸ NER, clauses S6.1.1(2), (4) and (5).

²⁹ Endeavour Energy, Regulatory Proposal, p 54; Endeavour Energy, Regulatory Proposal, Attachment 0.06.

³⁰ Endeavour Energy, Regulatory Proposal, Attachment 0.06, p 3.

³¹ NER, clauses 6.8.1A and 11.56.4(o); Endeavour Energy, Expenditure Forecasting Methodology, November 2013.

³² NER, clause S6.1.1(2); Endeavour Energy, Regulatory Proposal, pp. 51–61 and Attachment 0.08.

³³ Endeavour Energy, Regulatory Proposal, Attachment 0.08, pp. 10–15.

³⁴ Endeavour, Revised Regulatory Proposal, p.123

In our draft decision, we identified two aspects of Endeavour Energy's forecasting methodology which indicated that its methodology is not a sufficient basis on which to conclude that its proposed total forecast capex reasonably reflects the capex criteria. These were:

- Endeavour Energy's forecasting methodology applies a bottom-up build (or bottom-up assessment) to estimate the forecast expenditure for all its capex categories (except for information and communications technology).³⁵
- Endeavour Energy's cost-benefit evaluation of each of its capital projects or programs reveals that its underlying risk assessment is excessively conservative.³⁶

Endeavour Energy disagreed with our position in the draft decision and provided a report by Jacobs which stated that the NSW distributors' had applied a top-down assessment of their capex forecasts.³⁷ Further, Endeavour Energy did not agree with our conclusions on its lack of a cost-benefit analysis on the basis that they consider their planning approach already utilises probabilistic planning and cost-benefit analysis.³⁸ Finally, they did not agree with our conclusion that the risk assessments do not adequately justify the priority and timing of the capex forecasts.³⁹

We re-examined Endeavour Energy's forecasting approach and acknowledge that elements of a top down assessment were applied in the formulation of its regulatory proposal. However, our concern is that that these approaches do not appear to have been integral to the forecasting process. We consider that Endeavour Energy's forecasting methodology does not appropriately combine bottom up and top down approaches to forecasting. Accordingly, we remain of the view that Endeavour Energy's forecasting approach is not a sufficient basis on which to conclude that its proposed total forecast capex reasonably reflects the capex criteria.

EMCa noted that while Endeavour Energy's objective of containing network tariff increases to CPI could be construed as a cost forecasting discipline, this objective is not within the remit of the NER which, more appropriately, supports the determination of tariffs based on prudent and efficient expenditure allowances.⁴⁰ We agree with EMCa's view that the CPI price constraint applied by NNSW does not actually reflect the efficient operation of the network. Rather, it appears to be a strategy predicated on an assumption that prices need to continuously increase regardless of the actual need for network expenditure. We also note that Endeavour Energy's consultant Advisian appears to agree with this assessment. Advisian stated in its review of the NNSW methodology that:⁴¹

³⁵ AER, Draft Decision Endeavour Energy distribution determination 2015-2019, Attachment 6, pp. 19

³⁶ AER, Draft Decision Endeavour Energy distribution determination 2015-2019, Attachment 6, p. 19

³⁷ Attachment 1.4 System capex - Jacobs report p.30

³⁸ Endeavour, Revised Regulatory Proposal, p.123

³⁹ Endeavour, Revised Regulatory Proposal, p.113

⁴⁰ EMCa Review of Proposed Replacement Capex in Endeavour's Regulatory Proposal 2014 - 2019, p.11

⁴¹ Endeavour, Advisian - Networks NSW independent review of the risk based prioritisation process for Networks NSW - post implementation review, p. 2

In endorsing the improvements made in accordance with our recommendations, Advisian must point out that CASH is not yet a project prioritisation process. It is a risk scoring model. Project evaluation, including cost benefit analysis, is to be completed using “business as usual” evaluation processes outside of CASH. It does not automatically follow that a project with a high risk score in CASH is a high priority project – it may not be economic to significantly reduce the level of risk on a cost / benefit basis.

Advisian also stated that:⁴²

The model therefore flags projects / programs that should proceed to the next stage of capital evaluation to determining if enterprise investment criteria are met. It does not do this in its own right. This analysis is performed externally to CASH using “business as usual” investment guidelines. Some information, such as project identifiers and projects costs are linked back to CASH. However, portfolio optimisation, sizing of work programs and the like is performed outside of CASH.

We conclude, despite the presence of some top down assessment techniques, that Endeavour Energy’s forecasting methodology predominately relies upon a bottom up build (or bottom up assessment) to estimate the forecast expenditure for all its capex categories (except for information and communications technology). Bottom up approaches have a tendency to overstate required allowances as they do not adequately account for inter-relationships and synergies between projects or areas of work. Simply aggregating such estimates is unlikely to result in a total forecast capex allowance that we are satisfied reasonably reflects the capex criteria. Our review reflects the submission made by the National Generators Forum.⁴³

Historically, regulatory assessments of capital expenditure programs have predominantly incorporated bottom up assessments of a sample of projects and / or programs, with minimal top down assessment of the overall level of capex, underlying drivers and impacts on network prices. Given the substantial information asymmetry between distributors and regulators, past approaches have had limited success in determining an efficient overall level of capex for NSW distributors. It is far more difficult for a regulator to reject capital expenditure proposals on an individual project-by-project basis compared to setting a top down overall efficient level of capex within which distributors can prioritise individual projects.

Endeavour Energy in its revised proposal submitted that we have not properly engaged with the granular evidence in their proposals and have rather relied on high level analysis that does not account for our drivers and circumstances .⁴⁴ On the contrary,

⁴² Endeavour, Advisian - Networks NSW independent review of the risk based prioritisation process for Networks NSW - post implementation review, p. 7

⁴³ National Generators Forum, Submission to the Revenue Determinations (2014–2019) of the NSW Distribution Network Service Providers, p. 9.

⁴⁴ Endeavour, Revised Regulatory Proposal, p 112.

we engaged with Endeavour Energy's proposals, both initial and revised, in order to understand whether in the context of its overall capex proposal, its expenditure reasonably reflected the capex criteria. We accept that a particular project or program of capex may appear to be justified. However, our application of certain techniques reveals that when such programs are considered in the context of the entire portfolio of projects, it may not be prudent or efficient to undertake that overall level of expenditure. For this reason, top down techniques are well suited to assessing the efficient and prudent level of total capex.

Endeavour Energy's lack of a cost-benefit evaluation for each of its capital projects or programs reveals that its underlying risk assessment is excessively conservative. We agree with the assessment of Endeavour Energy's consultant Advisian that the CASH model is useful for identifying potentially necessary projects or programs.⁴⁵ We also agree with Advisian that this process does not determine if enterprise investment criteria are met.⁴⁶ As such, we maintain our view from the draft decision that Endeavour Energy has failed to fully justify the timing and priority of its proposed forecast capex. The same views have also been expressed by EMCa in their review of Endeavour Energy's proposed repex.⁴⁷

6.4.3 Interaction with the STPIS

We consider that our approved capital expenditure forecast is consistent with the setting of targets under the STPIS. Particularly, we consider that the capex allowance should not be set such that there is an expectation that it will lead to Endeavour Energy systematically under or over performing against its STPIS targets. We consider our approved capex forecast is sufficient to allow a prudent and efficient Endeavour Energy to maintain performance at the targets set under the STPIS. As such, it is appropriate to apply the STPIS as set out in attachment 11.

In making our final decision, we have specifically considered the impact our decision will have on the safety and reliability of Endeavour Energy's network. We consider our substitute estimate is sufficient for Endeavour Energy to maintain the safety, service quality and reliability of its network consistent with its obligations. In any event, our provision of a total capex forecast does not constrain a service provider's actual spending – either as a cap or as a requirement that the forecast be spent on specific projects or activities. It is conceivable that a service provider might wish to expend particular capital expenditure differently or in excess of the total capex forecast set out in our decision. Our decision does not constrain the service provider from doing so. Under our analysis of specific capex drivers, we have explained how our analysis and certain assessment techniques factor in safety and reliability requirements.

⁴⁵ Endeavour, Advisian - Networks NSW independent review of the risk based prioritisation process for Networks NSW - post implementation review, Advisian p. 7

⁴⁶ Endeavour, Advisian - Networks NSW independent review of the risk based prioritisation process for Networks NSW - post implementation review, Advisian p. 7

⁴⁷ EMCa Review of Proposed Replacement Capex in Endeavour's Regulatory Proposal 2014 - 2019, p. iii; and EMCa Review of Proposed Replacement Capex in Endeavour's Regulatory Proposal 2014 - 2019, pp. ii, 12–16.

Endeavour Energy submitted that in relying on our benchmarking and high level analysis we have not understood the implications of its decision on safety and reliability outcomes and its ability to efficiently meet our obligations as a distributor.⁴⁸ It provided reports from R2A Due Diligence and Jacobs in support of its position.⁴⁹ These contend that our capex forecast would negatively impact safety and reliability. We note the starting position of both consultant reports appears to be that any reduced capex forecast will result in the deferment of necessary reliability activities and that this necessarily has a negative impact on reliability.

We do not accept the underlying premise of these reports - that our approved capex results in the deferral of projects required to maintain reliability. As set out in Section 6.4.2 we consider that inappropriately low risk tolerances and lack of rigour in the forecasting approach has led Endeavour Energy to over forecast the work required in the forthcoming regulatory period. Accordingly, with proper prioritisation of its capital program Endeavour Energy will be able manage the safety and reliability of its network. This is evidenced in our augex and repex analysis below

Because we do not accept the starting premise that our approved capex forecast will result in Endeavour Energy deferring necessary maintenance tasks, we do not accept that the conclusions about safety and reliability found in the Jacobs and R2A report are correct. We note that Endeavour Energy is required to continue to maintain its network in accordance with its existing regulatory obligations. Whilst we consider our alternative capex estimate reasonably reflects the capex criteria, we also note that the regulatory framework provides some mitigation strategies should unforeseen circumstances lead to an overspend of the capex amount approved in this determination as part of total revenue.

6.4.4 Endeavour Energy's capex performance

We have looked at a number of historical metrics of Endeavour Energy's capex performance against that of other distributors in the NEM. We also compare Endeavour Energy's proposed forecast capex allowance against historical trends. These metrics are largely based on outputs of the annual benchmarking report and other analysis undertaken using data provided by the distributors for the annual benchmarking report. This includes Endeavour Energy's relative partial and multilateral total factor productivity (MTFP) performance, capex per customer and maximum demand, and Endeavour Energy's historic capex trend.

We note that the NER sets out that we must have regard to our annual benchmarking report.⁵⁰ This section shows how we have taken it into account. We consider this high level benchmarking at the overall capex level is suitable to gain an overall understanding of Endeavour Energy's proposal in a broader context. However, in our

⁴⁸ Endeavour, Revised Regulatory Proposal, p 109.

⁴⁹ Endeavour Energy - 1.14 Jacobs - Reliability Impact Assessment; Endeavour Energy - 1.09 R2A - Asset System Failure Safety Risk Assessment - January 2015

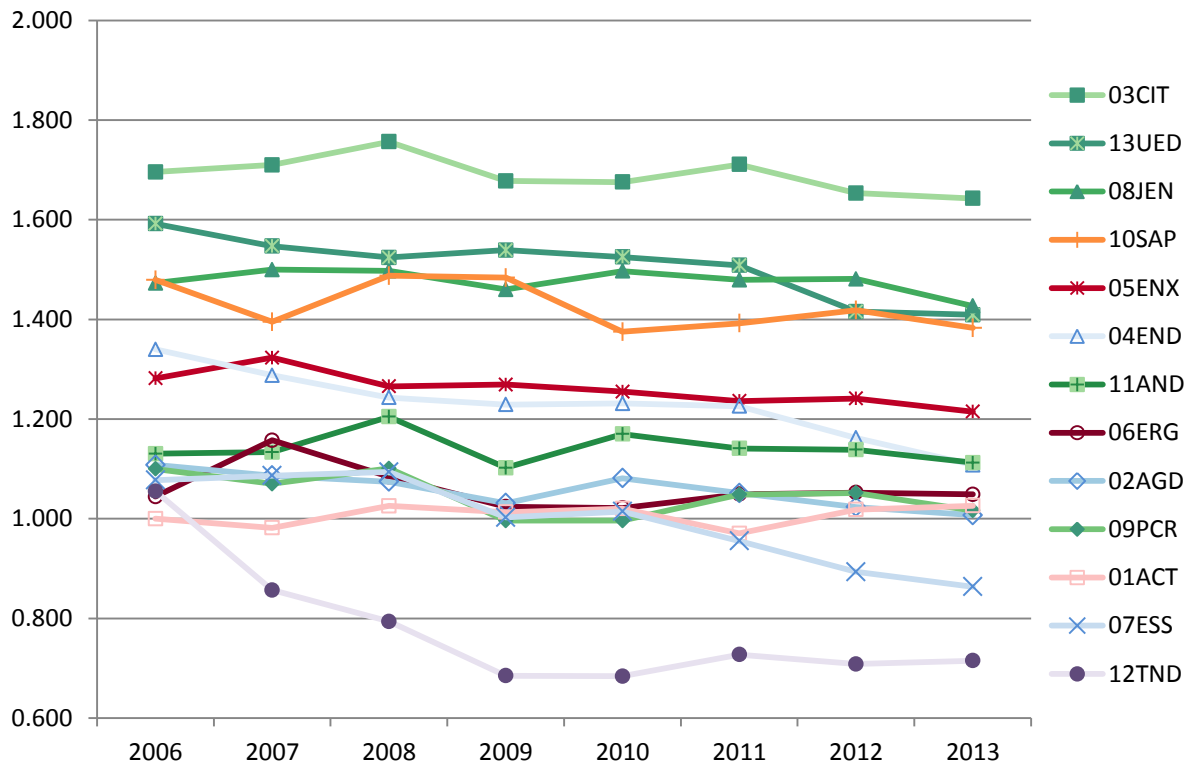
⁵⁰ NER, cl. 6.5.7(e).

capex assessment we have not relied on our high level benchmarking metrics set out below other than to note that these metrics generally support the outcomes of our other techniques - which demonstrate that Endeavour Energy has room to find some efficiencies in its capex program. We have not used this analysis in a deterministic manner in our capex assessment.

6.4.4.1 Partial factor productivity of capital and multilateral total factor productivity

Figure 6-2 shows a measure of partial factor productivity of capital taken from our benchmarking report. This measure incorporated the productivity of transformers, overhead lines and underground cables. Endeavour Energy outperforms the NSW and ACT distributors and a number of the Victorian distributors, but is significantly lower than the remaining Victorian and South Australian distributors.

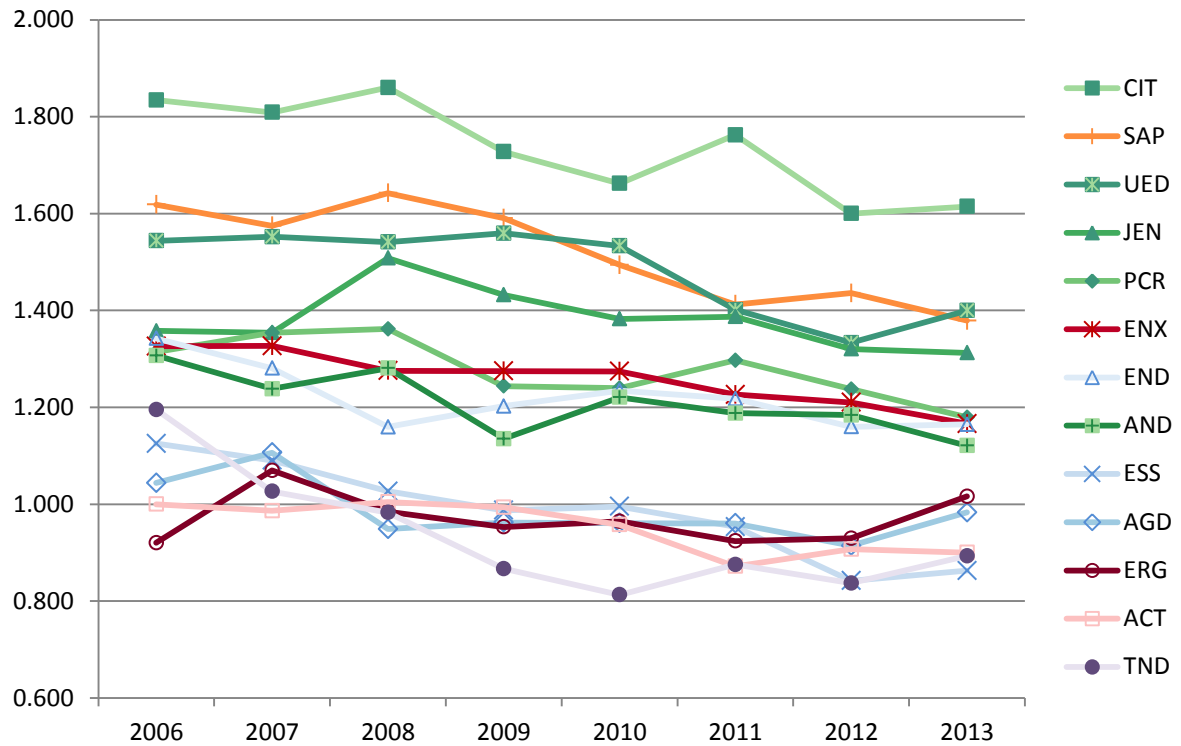
Figure 6-2 Partial factor productivity of capital (transformers, overhead and underground lines)



Source: AER annual benchmarking report

Figure 6-3 shows that Endeavour Energy performs similarly on MTFP. MTFP measures how efficient a business is in terms of its inputs (costs) and outputs (energy delivered, customer numbers, ratcheted maximum demand, reliability and circuit line length). Across all of these measures, Endeavour Energy outperformed the NSW and ACT distributors; however, the majority of the Victorian and South Australian distributors outperformed Endeavour Energy.

Figure 6-3 Multilateral total factor productivity



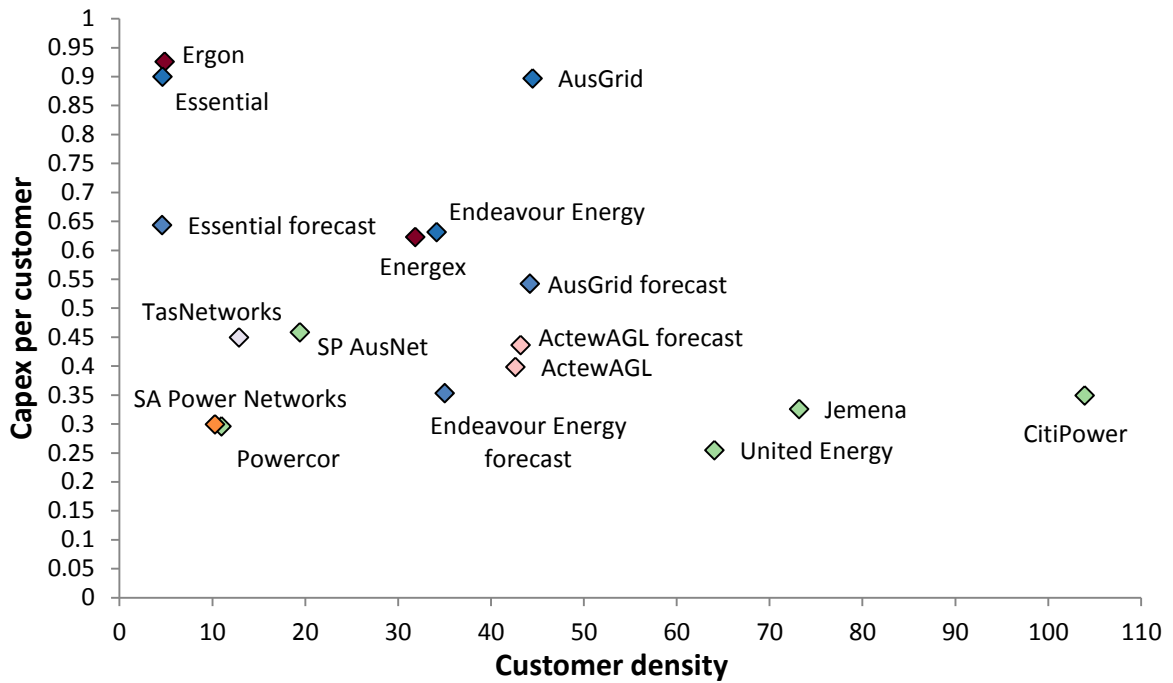
Source: AER annual benchmarking report

6.4.4.2 Relative capex efficiency metrics

Figure 6-4 and Figure 6-5 show capex per customer and per maximum demand, against customer density. Capex is taken as a five year average for the years 2008-12. For the NSW distributors and ActewAGL, we have also included the businesses' proposed capex for the 2014–2019 period. We have considered capex per customer as it reflects the amount consumers are charged for additional capital investments.

Figure 6-4 shows that Endeavour Energy had relatively high capex per customer for the 2008-2012 period. Endeavour Energy's capex per customer will reduce for the 2014–2019 period based on their proposed forecast capex. This reduction brings Endeavour Energy's capex per customer to a similar level as the Victorian and South Australian distributors.

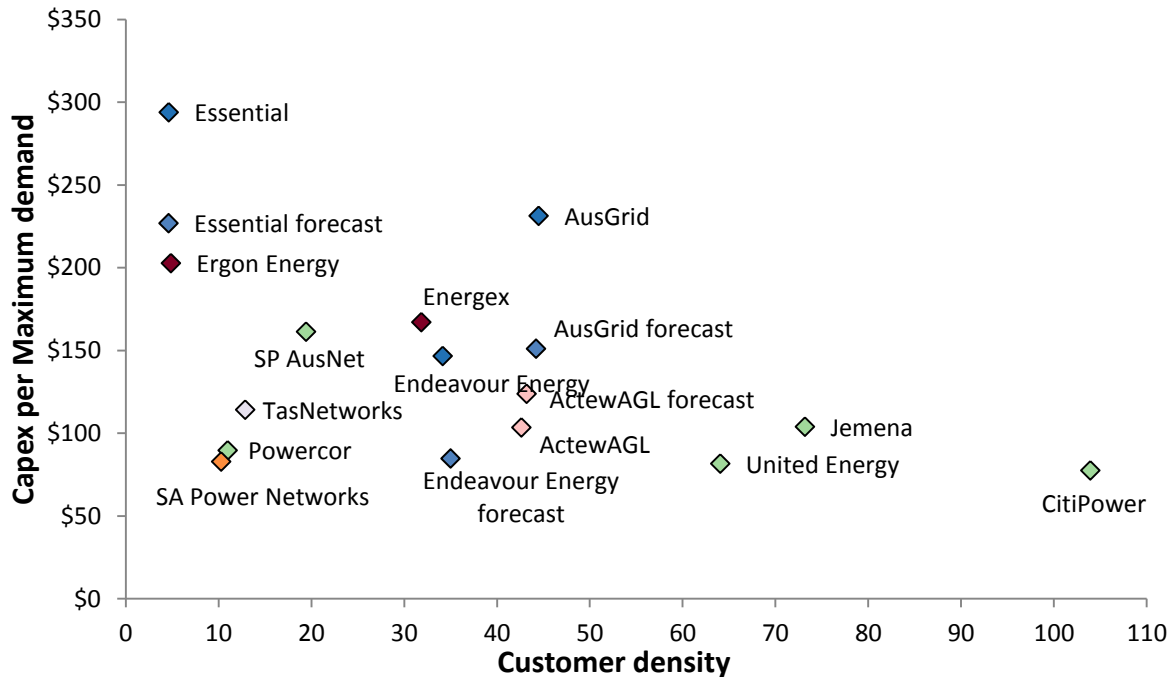
Figure 6-4 Capex per customer (000s, \$2013-14), against customer density



Source: AER analysis

Figure 6-5 shows that Endeavour Energy's capex per maximum demand for the 2008-2012 period was relatively high, but significantly lower than the other NSW distributors. Capex per maximum demand is forecast to reduce for Endeavour Energy in the next period but is still among the highest levels in the NEM. This reduction brings Endeavour Energy's capex per customer to a similar level as the Victorian and South Australian distributors and significantly below the other NSW distributors.

Figure 6-5 Capex per maximum demand (000s, \$2013-14), against customer density



Source: AER analysis

Endeavour Energy submitted that we relied on benchmarking analysis that contains errors and which does not meet the Australian Productivity Commission’s criteria for a valid benchmark.⁵¹ Specifically, it submits that the AER has not demonstrated how significant differences in network design, characteristics, environment and circumstances have been accounted for. Endeavour Energy is of the view that capex is even less suited to benchmarking than is opex given its non-recurrent and/or lumpy nature.⁵²

We have considered the submissions raised by all parties in response to our benchmarking approach. We generally conclude that our benchmarking approaches and specifications are appropriate and that the underlying data is sufficiently robust. A full consideration of these submissions is set out in Attachment 7. We do accept that due to the lumpy nature of capex, that it is less suited to benchmarking than opex. This was reflected in our draft decision in that we did not rely upon this high level benchmarking in a deterministic manner for capex. To the degree that we have relied upon benchmarks at the category level, this is set out in the relevant appendix.

Endeavour Energy further submits that its detailed engineering analysis provided to support its proposed capex should receive considerably more weight than what it

⁵¹ Endeavour, Revised Regulatory Proposal, p 115

⁵² Endeavour, Revised Regulatory Proposal, p 115

considers to be a high level, error prone tool.⁵³ We have considered the engineering material Endeavour Energy has put before us but as we are assessing capex at an overall level, such evidence will not necessarily provide us with an answer as to what is efficient expenditure. Bottom up builds based on such engineering material have a number of shortcomings and in the broad context of our evaluation, we may assess that less weight should be given to these.

Related to this, Endeavour Energy submits that we have misunderstood the AEMC's removal of the reference to a distributor's 'individual circumstances' as it is necessary to conduct a detailed review in order for the AER to be satisfied that the capex forecast which forms part of Endeavour Energy's revenue allowance satisfies the NEO. Endeavour Energy stated that:

The individual circumstances and obligations of a business must be considered rather than constructing a hypothetical benchmark distributor. In relying on benchmarking and high level analysis the AER has not understood the implications of its decision on safety and reliability outcomes and our ability to efficiently meet our obligations as a distributor.⁵⁴

We note that there is little disagreement between us and Endeavour Energy insofar as we accept that the AEMC removed the focus on a business' 'individual circumstances' in order to "clarify the ability of the AER to undertake benchmarking"⁵⁵ and remove any impediment to the use of benchmarking by the AER.⁵⁶ We agree with Endeavour Energy that "the intent of the AEMC was to provide additional tools to the AER to help simplify its approach and focus its assessment on key areas."⁵⁷ We also note that we have considered the safety and reliability outcomes in Appendix B.

6.4.4.3 Endeavour Energy historic trend and licence conditions

We have compared Endeavour Energy's capex proposal for the 2014–2019 period against the long term historical trend in capex levels. We have specifically considered how Endeavour Energy's capex allowance should change to reflect current trends in demand and changes in licence conditions.

Networks NSW commented that at the time of submitting their regulatory proposals for the previous determination, the distributors needed to address the legacy of previous under-investment in their networks. While it is arguable that earlier periods may reflect unsustainable expenditure, for the reasons outlined below, we consider the 2009–2014 regulatory period is likely to overstate capex levels. Figure 6-6 shows actual historic capex and proposed capex between 2001-12 and 2018-19. This figure shows that

⁵³ Endeavour, Revised Regulatory Proposal, p.115

⁵⁴ Endeavour, Revised Regulatory Proposal, 109

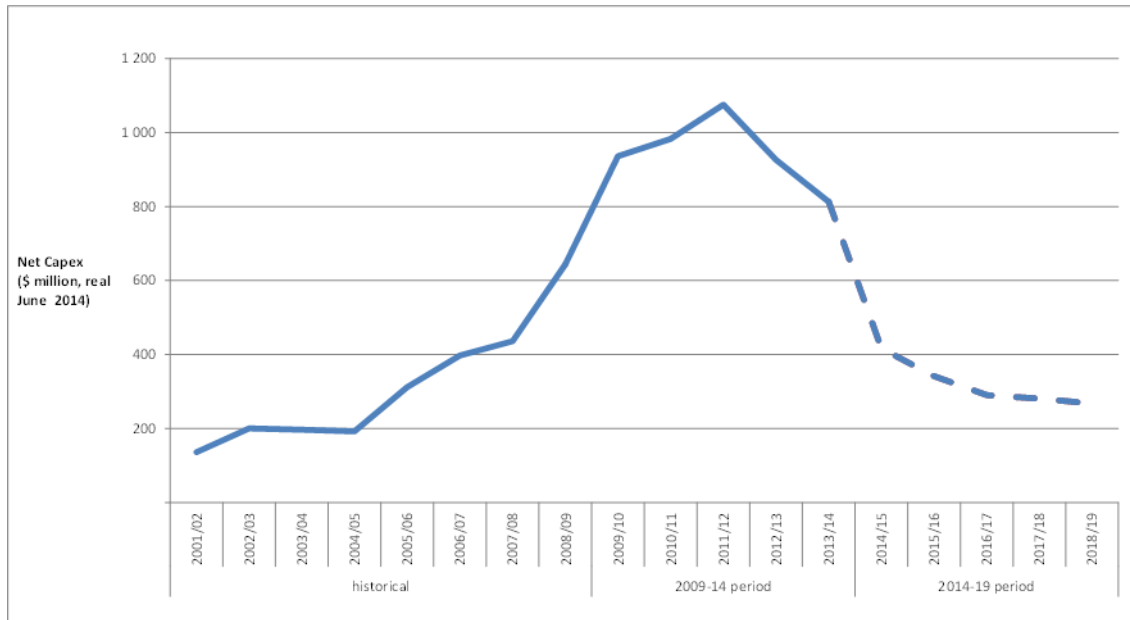
⁵⁵ AEMC, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, November 2012, pg. 85

⁵⁶ AEMC, National Electricity Amendment (Economic Regulation of Network Service Providers) Rule 2012, November 2012, p. 97.

⁵⁷ Endeavour Revised Regulatory Proposal, p 109.

Endeavour Energy's average proposed capex for the 2014–2019 period is relatively high when compared with the historical average.

Figure 6-6 Endeavour Energy total capex (including overheads)—historical and forecast for 2014–2019 period



Source: Historical: IPART Regulatory Accounts (prior to 2010/11) and AER Annual RINs (2010/11 to 2013/14)
2014–2019 period: Endeavour Energy Reset RIN, Table 2.1.1 - Standard control services capex)

In our draft decision we stated that a key driver of capex from 2005 was the NSW licence conditions around design standards and that these were removed in July 2014.⁵⁸ As outlined in our draft decision, we anticipate that removing the design planning requirements should reduce capex requirements for NSW distributors based on the following.⁵⁹ Australian Energy Market Operator estimated:

NSW customers could save up to \$50 a year on their electricity bills from 2015 without any detrimental effect to current reliability levels if a probabilistic approach to distribution reliability was adopted over the current and next financial year.⁶⁰

⁵⁸ Endeavour, Revised Regulatory Proposal, 6-27

⁵⁹ AER, Draft Decision Endeavour distribution determination 2015-2019, Attachment 6, p. 6-27

⁶⁰ AEMO, Submission to AEMC's Review of Distribution Reliability Outcomes and Standards, Draft Report - NSW Workstream, p. 1

The AEMC estimated that capex could reduce by '\$140 million under the modest reduction scenario to \$530 million under the extreme reduction scenario' over a five year timeframe for the three NSW distributors.⁶¹

Even without the change in standards, it could be expected that NSW distributors' capex would come down for the 2014–2019 period given the significant capex invested from 2005–06 to meet the standards. As noted by the AEMC:

We note that significant investment has been made since the NSW distribution reliability requirements were increased in 2005 and that future investment will be incremental in order to maintain reliability at the current level.⁶²

Endeavour Energy submitted that its initial proposal already reflected the achievement of mandatory licence conditions during 2009-14⁶³ and questioned the basis of the AER's use of the period prior to 2009 as a benchmark.⁶⁴ Endeavour Energy also stated that the removal of some of these conditions does not substantively impact the way it runs its network. It instead provides it with "increased discretion as to the timing and planning of the required investment" and only if it had been "substantively non-compliant at the end of the 2009-14 period would the removal of certain licence conditions materially alleviate investment needs in 2014-19."⁶⁵ Endeavour Energy submitted that we formed an unreasonable view regarding the changes and trends in its capex.⁶⁶ Its consultant, Jacobs, states that historical trend projections are useful only for the purposes of providing a context for the future projections rather than being a predictor of future need.⁶⁷ In its view, this is so because it cannot be assumed that historical drivers of investment will be identical in the future especially where there is an ageing asset base.⁶⁸

We note that one of the capex factors that the AER is expressly required to have regard to is the actual and expected capex of the distributor during the preceding regulatory control periods.⁶⁹ That is, the NER recognises that past expenditure is an important factor to consider in assessing forecast expenditure. We accept, as Jacobs points out, that it provides context for future projections. It also demonstrates the level of expenditure that a distributor has previously incurred to provide its services.

⁶¹ AEMC, Review of Distribution Reliability Outcomes and Standards, Final Report - NSW Workstream, 31 August 2012, p. vi, <http://www.aemc.gov.au/media/docs/NSW-workstream-final-report-160466c4-733b-4cf2-b4e3-4095c6d9819b-0.pdf>.

⁶² AEMC, Review of Distribution Reliability Outcomes and Standards, Final Report - NSW Workstream, 31 August 2012, p. iii, <http://www.aemc.gov.au/media/docs/NSW-workstream-final-report-160466c4-733b-4cf2-b4e3-4095c6d9819b-0.pdf>.

⁶³ Endeavour Revised Regulatory Proposal, p. 118

⁶⁴ Endeavour, Revised Regulatory Proposal, p. 118

⁶⁵ Endeavour, Revised Regulatory Proposal, p. 118

⁶⁶ Endeavour, Revised Regulatory Proposal, p. 115

⁶⁷ Endeavour Energy - 1.14 Jacobs - Reliability Impact Assessment p. 34

⁶⁸ Endeavour Energy - 1.14 Jacobs - Reliability Impact Assessment p. 34

⁶⁹ NER, cl. 6.5.7(e)(5).

As a starting point, past expenditure is indicative of future expenditure if the operating environment remains similar over the time period. If there is a material change in operating environment, then this needs to be factored into any trend analysis. We consider that the removal of design planning standards from the licence conditions in 2014 is such a material change. For this reason, we maintain our position that at the total capex level, our trend analysis indicates that the 2009-14 regulatory period is likely to be higher than the efficient level of capex in the 2014-19 period.⁷⁰

6.4.5 Interrelationships

There are a number of interrelationships between Endeavour Energy's total forecast capex for the 2014–2019 period and other components of its distribution determination that we have taken into account in coming to our final decision. Table 6-4 summarises these other components and their interrelationships with Endeavour Energy's total forecast capex.

Table 6-4 Interrelationships between total forecast capex and other components

Other component	Interrelationships with total forecast capex
Total forecast opex	<p>There are elements of Endeavour Energy's total forecast opex that are related to its total forecast capex. These are:</p> <ul style="list-style-type: none"> • the labour cost escalators that we approved in Attachment 7 • the amount of maintenance opex that is reflected in Endeavour Energy's opex base year that we approved in Attachment 7 <p>The labour cost escalators are interrelated with capex because Endeavour Energy's total forecast capex includes expenditure for capitalised labour. Maintenance opex is also related to capex, although we did not approve a specific amount of maintenance opex as part of assessing Endeavour Energy's total forecast opex. This is because the amount of maintenance opex that is reflected in Endeavour Energy's opex base in part determines the extent to which Endeavour Energy needs to spend repex during the 2014–2019 period.</p>
Forecast demand	<p>Forecast demand is related Endeavour Energy's total forecast capex. Growth driven capex, which includes augex and customer connections capex, is typically triggered by a need to build or upgrade a network to address changes in demand or to comply with quality, reliability and security of supply requirements. Hence, the main driver of growth-related capex is maximum demand and its effect on network utilisation and reliability.</p>
Capital Expenditure Sharing Scheme (CESS)	<p>The CESS is related to Endeavour Energy's total forecast capex. In particular, the effective application of the CESS is contingent on the approved total forecast capex being efficient, and that it reasonably reflects the capex criteria. As we noted in [the capex criteria table below], this is because any efficiency gains or losses are measured against the approved total forecast capex. In addition, in future distribution determinations we will be required to undertake an ex post review of the efficiency and prudence of capex, with the option to exclude any inefficient capex in excess of the approved total forecast capex from Endeavour Energy's regulatory asset base. In particular, the CESS will ensure that Endeavour Energy bears at least 30 per cent of any overspend against the capex allowance. Similarly, if Endeavour Energy can fulfil their objectives without spending the full capex allowance, it will be able to retain 30 per cent of the benefit of this. In addition, if an overspend is found to be</p>

⁷⁰ We have applied trend analysis deterministically for non -network capex because we consider there is a high level of recurrent expenditure in this category.

inefficient through the ex post review, Endeavour Energy risks having to bear the entire overspend.

Service Target Performance Incentive Scheme (STPIS)	<p>The STPIS is interrelated to Endeavour Energy's total forecast capex, in so far as it is important that it does not include any expenditure for the purposes of improving supply reliability during the 2014–2019 period. This is because such expenditure should be offset by rewards provided through the application of the STPIS.</p> <p>Further, the forecast capex should be sufficient to allow Endeavour Energy to maintain performance at the targets set under the STPIS. The capex allowance should not be set such that there is an expectation that it will lead to Endeavour Energy systematically under or over performing against its targets.</p>
Contingent project	<p>A contingent project is interrelated to Endeavour Energy's total forecast capex. This is because an amount of expenditure that should be included as a contingent project should not be included as part of Endeavour Energy's total forecast capex for the 2014–2019 period.</p> <p>We did not identify any contingent projects for Endeavour Energy during the 2014–2019 period.</p>

Source: AER analysis

6.4.6 Capex factors

In deciding whether or not we are satisfied Endeavour Energy's forecast reasonably reflects the capex criteria, we have had regard to the following capex factors when applying our assessment techniques to the total proposed capex forecast, and where relevant, to different sub-categories of proposed expenditure. Table 6-5 summarises how we have taken into account the capex factors.

Table 6-5 AER consideration of the capex factors

Capex factor	AER consideration
The most recent annual benchmarking report and benchmarking capex that would be incurred by an efficient distributor over the relevant regulatory control period	We have had regard to our most recent benchmarking report in assessing Endeavour Energy's proposed total forecast capex and in determining our alternative estimate for the 2014–2019 period. This can be seen in the metrics we used in our assessment of Endeavour Energy's capex performance.
The actual and expected capex of Endeavour Energy during any preceding regulatory control periods	<p>We have had regard to Endeavour Energy's actual and expected capex during the 2009–2014 and preceding regulatory control periods in assessing its proposed total forecast.</p> <p>This can be seen in our assessment of Endeavour Energy's capex performance. It can also be seen in our assessment of the forecast capex associated with the capex drivers that underlie Endeavour Energy's total forecast capex.</p> <p>For non-network related capex, we rely on trend analysis to arrive at an estimate that meets the capex criteria.</p>
The extent to which the capex forecast includes expenditure to address concerns of electricity consumers as identified by Endeavour Energy in the course of its engagement with electricity consumers	We have had regard to the extent to which Endeavour Energy's proposed total forecast capex includes expenditure to address consumer concerns that have been identified by Endeavour Energy. On the information available to us, including submissions received from stakeholders, we have been unable to identify the extent to which Endeavour Energy's proposed total forecast capex includes capex that address the concerns of its consumers that it has identified.
The relative prices of operating and capital inputs	We have had regard to the relative prices of operating and

	capital inputs in assessing Endeavour Energy's proposed real cost escalation factors for materials. In particular, we have accepted Endeavour Energy's proposal to not apply real cost escalation for materials.
The substitution possibilities between operating and capital expenditure	We have had regard to the substitution possibilities between opex and capex. We have considered whether there are more efficient and prudent trade-offs in investing more or less in capital in place of ongoing operations. See our discussion about the interrelationships between Endeavour Energy's total forecast capex and total forecast opex in Table 6-4 above.
Whether the capex forecast is consistent with any incentive scheme or schemes that apply to Endeavour Energy	We have had regard to whether Endeavour Energy's proposed total forecast capex is consistent with the CESS and the STPIS. See our discussion about the interrelationships between Endeavour Energy's total forecast capex and the application of the CESS and the STPIS in Table 6-4 above.
The extent to which the capex forecast is referable to arrangements with a person other than the distributor that do not reflect arm's length terms	We have had regard to whether any part of Endeavour Energy's proposed total forecast capex or our alternative estimate that is referable to arrangements with a person other than Endeavour Energy that do not reflect arm's length terms. We did not identify any parts of Endeavour Energy's proposed total forecast capex or our alternative estimate that is referable in this way.
Whether the capex forecast includes an amount relating to a project that should more appropriately be included as a contingent project	We have had regard to whether any amount of Endeavour Energy's proposed total forecast capex or our alternative estimate that relates to a project that should more appropriately be included as a contingent project. We did not identify any such amounts that should more appropriately be included as a contingent project.
The extent to which Endeavour Energy has considered and made provision for efficient and prudent non-network alternatives	We have had regard to the extent to which Endeavour Energy made provision for efficient and prudent non-network alternatives as part of our assessment of the capex associated with the non-network capex driver. We discuss this further in Appendix B.
Any other factor the AER considers relevant and which the AER has notified Endeavour Energy in writing, prior to the submission of its revised regulatory proposal, is a capex factor	We did not identify any other capex factor that we consider relevant.

Source: AER analysis

6.5 Clarification of numerical differences

In our draft decision, some discrepancies arose when we allocated Endeavour Energy's 'balancing item' across the expenditure driver categories. We used the balancing item identified in Endeavour Energy's RIN of \$422 million. In developing the RIN templates we had included provision for a balancing item to allow businesses to remove the double counting of expenditure that might be included in more than one driver. It was not expected that the balancing item would have large positive values, as was the case for Endeavour Energy. We therefore considered it necessary to allocate the balancing item across the expenditure categories for the purposes of deriving a substitute forecast. Endeavour Energy submitted that this did not accord with how it had prepared its initial proposal.

Following Endeavour Energy's submission of further information to assist us in clarifying these discrepancies, we no longer consider this adjustment is required. Endeavour Energy submitted that:⁷¹

To summarise the AER, in error, has significantly overstated the system capex reduction of 30.86% by including capital contributions in the calculation. This is a result of the AER allocating the balancing item to the RIN categories despite the fact that this item primarily consists of the accepted capital contributions figure of \$357 million. This means the AER has double counted, in part, the subtraction of capital contributions, along with other numerical errors.

We understand the majority of the balancing item related to 'gifted assets.' Gifted assets are assets that are paid for by connecting consumers and then are gifted to the distributor to be managed and operated for the remainder of their life. No funds are received for these assets and as such the value that Endeavour Energy ascribes to them should be excluded from the calculations. We accept that this is an appropriate allocation of the balancing item and treatment of gifted assets.

Table 6-1 sets out a reconciliation of all stages of our decision making process presented on a consistent basis. This information is provided to assist stakeholders in comparing forecasts across the decision making process. The change that we have adopted to the treatment of gifted assets does not change the underlying analysis set out in our draft decision.

⁷¹ Endeavour, Revised Regulatory Proposal, p.104

Table 6-6 Allocation of balancing item to driver

\$ million (\$2013/14)	Initial Proposal	Initial Proposal (Balancing item re-allocated by Endeavour)	Initial Proposal (Balancing item re-allocated by AER)	Draft Decision	Revised Proposal	Final Decision
Augmentation	314.8	324.8	426.1	351.8	282.8	282.8
Connections	76.2	76.2	105.8	105.8	77.2	77.2
Replacement	739.7	747.3	1,020.7	661.1	664.5	664.5
Reliability improvement	65.4	50.9	65.4	-	24.7	24.7
Other System Capex	-	-	-	-	20.4	20.4
Non-Network	176.4	176.4	176.4	163.3	165.7	165.7
Capitalised overheads	308.5	346.0	308.5	145.3	360.6	360.6
Balancing item	422.0	24.5	-	-	-	-
Gifted Assets	(In balancing item)	356.9	(Allocated across all categories)	(Allocated across all categories)	407.5	407.5
TOTAL GROSS CAPEX	2103.0	2102.9	2103.0	1427.4	2003.4	2003.4
Capcons	356.9	356.9	356.9	356.9	407.5	407.5
TOTAL NET CAPEX	1746.1	1746.0	1746.1	1070.5	1595.8	1595.8

Source: AER analysis

A Assessment techniques

This appendix describes the assessment approaches we have applied in assessing Endeavour Energy's proposed forecast capex. The extent to which we rely on each of the assessment techniques is set out in Appendix B.

The assessment techniques that we apply in capex are necessarily different from those we apply in the assessment of opex. This is reflective of differences in the nature of the expenditure being assessed. As such, we use some assessment techniques in our capex assessment that are not suitable for assessing opex and vice versa. We set this out in our expenditure assessment guideline, where we stated:⁷²

Past actual expenditure may not be an appropriate starting point for capex given it is largely non-recurrent or 'lumpy', and so past expenditures or work volumes may not be indicative of future volumes. For non-recurrent expenditure, we will attempt to normalise for work volumes and examine per unit costs (including through benchmarking across distributors) when forming a view on forecast unit costs.

Other drivers of capex (such as replacement expenditure and connections works) may be recurrent. For such expenditure, we will attempt to identify trends in revealed volumes and costs as an indicator of forecast requirements.

The assessment techniques that we have used to assess Endeavour Energy's capex are set out below.

A.1 Economic benchmarking

Economic benchmarking is one of the key outputs of our annual benchmarking report. We are required to consider economic benchmarking as it is one of the capex factors under the NER.⁷³ Economic benchmarking applies economic theory to measure the efficiency of a distributor's use of inputs to produce outputs, having regard to environmental factors.⁷⁴ It allows us to compare the performance of a distributor against its own past performance, and the performance of other distributors. Economic benchmarking helps us to assess whether a distributor's capex forecast represents efficient costs.⁷⁵ As stated by the AEMC, 'benchmarking is a critical exercise in assessing the efficiency of a NSP'.⁷⁶

A number of economic benchmarks from the annual benchmarking report are relevant to our assessment of capex. These include measures of total cost efficiency and overall capex efficiency. In general, these measures calculate a distributor's efficiency

⁷² Expenditure assessment guideline p.8

⁷³ NER, cl. 6.5.7(e)(4).

⁷⁴ AER, Explanatory Statement: Expenditure Forecasting Assessment Guidelines, November 2013.

⁷⁵ NER, cl. 6.5.7(c).

⁷⁶ AEMC, Economic Regulation Final Rule Determination, p. 25.

with consideration given to its inputs, outputs and its operating environment. We have considered each distributor's operating environment in so far as there are factors that are outside of a distributor's control but which affect a distributor's ability to convert inputs into outputs.⁷⁷ Once such exogenous factors are taken into account, we expect distributors to operate at similar levels of efficiency. One example of an exogenous factor that we have taken into account is customer density. For more on how we have forecast these measures, see our annual benchmarking report.⁷⁸

In addition to the measures in the annual benchmarking report, we have considered how distributors have performed on a number of overall capex metrics, including capex per customer, and capex per maximum demand. We have calculated these economic benchmarks based on actual data from the previous regulatory control period.

The results from the economic benchmarking give an indication of the relative efficiency of each of the distributors, and how this has changed over time.

A.2 Trend analysis

We have considered past trends in actual and forecast capex. This is one of the capex factors to which we are required to have regard to under the NER.⁷⁹

Trend analysis involves comparing NSPs' forecast capex and work volumes against historic levels. Where forecast capex and volumes are materially different to historic levels, we have sought to understand what has caused these differences. In doing so, we have considered the reasons given by the distributors in their proposals, as well as changes in the circumstances of the distributor.

In considering whether a business' capex forecast reasonably reflects the capex criteria, we need to consider whether the forecast will allow the business to meet expected demand, and comply with relevant regulatory obligations.⁸⁰ Demand and regulatory obligations (specifically, service standards) are key drivers of capex. More onerous standards will increase capex, as will growth in maximum demand. Conversely, reduced service obligations or a decline in demand will likely cause a reduction in the amount of capex required by a distributor.

Maximum demand is a key driver of augmentation or demand driven expenditure. As augmentation often needs to occur prior to demand growth being realised, forecast rather than actual demand is relevant when a business is deciding what augmentation projects will be required in an upcoming regulatory control period. However, to the extent that the forecast demand changes, a business should incorporate this updated information and reassess the need for the projects. Growth in a business' network will also drive augmentation and connections related capex. For these reasons it is

⁷⁷ AEMC, Economic Regulation Final Rule Determination, p.113. Exogenous factors could include geographic factors, customer factors, network factors and jurisdictional factors.

⁷⁸ AER, Annual Benchmarking Report, 2014.

⁷⁹ NER, cl. 6.5.7(e)(5).

⁸⁰ NER, cl. 6.5.7(a)(3).

important to consider how trends in capex (and in particular, augex and connections) compare with trends in demand (both maximum demand and customer numbers).

For service standards, there is generally a lag between when capex is undertaken (or not) and when the service improves (or declines). This is important in considering the expected impact of an increase or decrease in capex on service levels. It is also relevant to consider when service standards have changed and how this has affected a NSP's capex requirements.

We have looked at trends in capex across a range of levels including at the total capex level, for growth related capex, for replacement capex, and for each of the categories of capex, as relevant. We have also compared these with trends in demand and changes in service standards over time.

A.3 Category analysis

Expenditure category level analysis allows us to compare expenditure across NSPs, and over time, for various levels of capex:

- overall costs within each category of capex
- unit costs, across a range of activities
- volumes, across a range of activities
- asset lives, across a range of asset classes which we have used in assessing repex.

Using standardised reporting templates, we have collected data on augex, repex, connections, non-network capex, overheads and demand forecasts for all distributors in the NEM. The use of standardised category data allows us to make direct comparisons across distributors. Standardised category data also allows us to identify and scrutinise different operating and environmental factors that affect the amount and cost of works performed by distributors, and how these factors may change over time.

A.4 Predictive modelling

Predictive modelling uses statistical analysis to determine the expected efficient costs over the regulatory control period associated with the demand for electricity services for different categories of works. We have two predictive models:

- the repex model
- the augex model (used in a qualitative sense)

The use of the repex and augex models is directly relevant to assessing whether a distributor's capex forecast reasonably reflects the capex criteria.⁸¹ The models draw

⁸¹ NER, cl. 6.5.7(c).

on actual capex incurred by a distributor during the preceding regulatory control period. This past capex is a factor that we must take into account.⁸²

The repex model is a high-level probability based model that forecasts asset replacement capex (repex) for various asset categories based on their condition (using age as a proxy), and unit costs. In instances where we consider a distributor's proposed repex does not conform to the capex criteria, we have used this (in combination with other techniques where appropriate) to generate a substitute forecast.

The augex model is used to forecast the amount of augmentation driven by increases in maximum demand. IT compares utilisation thresholds with forecasts of maximum demand to identify the parts of a network segment that may require augmentation.⁸³ The model then uses capacity factors to calculate required augmentation, and unit costs to derive an augex forecast for the distributor over a given period.⁸⁴ In this way, the augex model accounts for the main internal drivers of augex that may differ between distributors, namely peak demand growth and its impact on asset utilisation. We can use the augex model to identify general trends in asset utilisation over time as well as to identify outliers in a distributor's augex forecast.⁸⁵ We have not relied heavily on the augex model for this reset. This is because much of the augex in the 2009–2014 period was due to compliance with the design standard in the licence conditions rather than reflecting growth in demand. We consider the augex model will be applied to a greater degree in future determinations. This is likely to occur when demand driven augex is a more material driver of expenditure.

A.5 Engineering review

We have engaged engineering consultants, EMCa, to assist with our review of distributors' capex proposals. This has involved reviewing distributor's processes, and specific projects and programs of work.

In particular, in respect of augex and repex, our engineering consultants considered whether the distributor's:

- Forecast is reasonable and unbiased, by assessing whether the distributor's proposed capex is a reasonable forecast of the unbiased efficient cost of maintaining performance at the required or efficient service levels.
- Risk management is prudent and efficient, by assessing whether the business manages risk such that the cost to the customer of achieving the capex objectives at the required or efficient service levels is commensurate with the customer value provided by those service levels.

⁸² NER, cl. 6.5.7(e)(5).

⁸³ Asset utilisation is the proportion of the asset's capability under use during peak demand conditions.

⁸⁴ For more information, see: AER, Guidance document: AER augmentation model handbook, November

⁸⁵ AER, 'Meeting summary – distributor replacement and augmentation capex', Workshop 4: Category analysis work-stream – Replacement and demand driven augmentation (Distribution), 8 March 2013, p. 1.

- Costs and work practices are prudent and efficient, by assessing whether the distributor uses the minimum resources reasonably practical to achieve the capex objectives and maintain the required or efficient service levels.

These factors relate directly to our assessment of whether the distributor's proposal reflects the efficient costs that a prudent operator would require to achieve the capex objectives:⁸⁶

- If a capex forecast is reasonable and unbiased, the forecast should reflect the efficient costs required to meet the capex objectives. That is, there should be no systemic biases which result in a forecast that is greater than or less than the efficient forecast. Further, the forecast should be reasonable in that it reflects what a prudent operator would incur to achieve the capex objectives.
- If the distributor's risk management is prudent and efficient, the distributor's forecast is likely to reflect the costs that a prudent operator would require to achieve the capex objectives. A prudent operator would consider both the probability of a risk eventuating and the impact of the risk (if it were to occur) in determining whether to undertake work to mitigate the risk.⁸⁷
- If the distributor's costs and work practices are prudent and efficient, the distributor will have the appropriate governance and asset management practices to ensure that the distributor has determined an efficient capex forecast that is based on a realistic expectation of the demand forecast and cost inputs required to achieve the capex objectives.

The engineering consultants applied a sampling approach in considering the above factors. Where this revealed concerns about systemic issues, we asked the engineers to take a broader sample and to quantify the likely impact of these biases.

In some cases we have also reviewed specific capex projects or programs of work to determine whether these meet the capex criteria. These reviews have been undertaken in respect of particular capex categories including for non-network capex and have included the assessment of:

- the options the distributor investigated to address the economic requirement (for example, for augmentation projects the review should have included an assessment of the extent to which the distributor considered and provided for efficient and prudent non-network alternatives⁸⁸)
- whether the timing of the project is efficient
- unit costs and volumes, including comparisons with relevant benchmarks

⁸⁶ NER, cl. 6.5.7(c).

⁸⁷ This approach is supported by NERA Economic Consulting, see NERA, Economic Interpretation of cl. 6.5.6 and 6.5.7 of the National Electricity Rules, Supplementary Report

⁸⁸ NER, cl. 6.5.7(c)(10).

- whether the project should more appropriately be included as a contingent project⁸⁹
- deliverability of the project, given other capex and opex works
- the relative prices of operating and capital inputs and the substitution possibilities between operating and capital expenditure⁹⁰
- the extent to which the capex forecast is referable to arrangements with a person other than the distributor that, in the opinion of the AER, do not reflect arm's length terms⁹¹, where relevant
- the extent to which the capex forecast includes expenditure to address the concerns of electricity consumers as identified by the distributor in the course of its engagement with electricity consumers.⁹² This is most relevant to core network expenditure (augex and repex) and may include the distributor's consideration of the value of customer reliability (VCR) standard or a similar appropriate standard.

⁸⁹ This principally relates to augex. See NER, cl. 6.5.7(e)(9A).

⁹⁰ This principally relates to augex. See NER, cl. 6.5.7(e)(6) and (e)(9A).

⁹¹ NER, cl. 6.5.7(e)(9).

⁹² NER, cl. 6.5.7(e)(5A).

B Assessment of forecast capex drivers

We present our detailed analysis of the sub-categories of Endeavour Energy's revised forecast capex for the 2014–2019 period in this Appendix. These sub-categories reflect the drivers of forecast capex over the 2014–2019 period. These drivers are augmentation capex (augex), customer connections capex, replacement capex (repex), reliability improvement capex, capitalised overheads and non-network capex.

As we discuss in the capex attachment, we are satisfied that Endeavour Energy's proposed total forecast capex reasonably reflects the capex criteria. In this appendix we set out further analysis in support of this view. This further analysis also explains the basis for our alternative estimate of Endeavour Energy's total forecast capex that we are satisfied reasonably reflects the capex criteria. In coming to our views and our alternative estimate we have applied the assessment approach that we discuss in section 6.3.

This appendix sets out our findings and views on our overall alternative estimate which forms the basis of our substitute estimate, as well as our analysis of each sub-category of capex. The structure of this appendix is:

- Section B.1: alternative estimate
- Section B.2: forecast augex
- Section B.3: forecast customer connections capex, including capital contributions
- Section B.4: forecast repex
- Section B.5: forecast reliability improvement capex
- Section B.6: forecast capitalised overheads
- Section B.7: non-network capex
- Section B.8: other system assets
- Section B.9: demand management.

In each of sections B.1 - B.9 we examine nine sub-categories of capex which we include in our alternative estimate. For each such sub-category, we explain why we are satisfied the amount of capex that we include in our alternative estimate reasonably reflects the capex criteria (alternative estimate).

B.6 Alternative estimate

Having examined Endeavour Energy's proposal, we formed a view on our alternative estimate of the capex required to reasonably reflect the capex criteria. Our alternative estimate is based on our assessment techniques, explained in section 6.3 and Appendix B. Our weighting of each of these techniques, and our response to Endeavour Energy's submissions on the weighting that should be given to particular techniques, are set out under the capex drivers in Appendix B.

We have considered the interaction between the removal of the design planning standards, the minimum reliability standards and the historical reliability that Endeavour Energy has been achieving. We consider that our decision takes into account the removal of the design planning standards and provides a level of capex that is commensurate with the removal of this standard. Further, we consider Endeavour Energy will be able to maintain both its average reliability level and meet its minimum reliability standards within our approved capex forecast. Our approved capex forecast must also be considered in the context of the significant capex program undertaken in the previous regulatory period.

We are satisfied that our alternative estimate reasonably reflects the capex criteria.

B.7 AER findings and estimates for augmentation expenditure

Augex is driven by a service provider's need to build or augment its network. The main driver of augex is maximum demand and its effect on network utilisation. It can also be triggered by the need to upgrade the network to comply with quality, safety, reliability and security of supply requirements. Our assessment of augex seeks to establish the prudent and efficient expenditure that Endeavour Energy will likely require to build or augment its network in response to these drivers.

B.7.1 Position

Our estimate of required augex for Endeavour Energy for the 2014–19 period is \$282.8 million (\$2013–14). This is consistent with Endeavour Energy's augex forecast included in their revised proposal (excluding overheads).

In our draft decision, we did not accept Endeavour Energy's initial proposed augex of \$314.8 million (\$2013–14). We concluded that it did not reasonably reflect the capex criteria. Table B-1 is provided to assist stakeholders in comparing forecasts across the decision making process.

Table B-1 Augex forecasts comparisons

\$ million (\$2013/2014)	Initial Proposal	AER Draft Decision	Revised Proposal	Final Decision
\$ million	314.8	257.2	282.8	282.8
% reduction from initial proposal	-	-18%	-11%	-11%

Source: AER Analysis, Endeavour Energy revised proposal

Note: As set out in section 6.5, due to the change in approach to allocating capital contributions and gifted assets between our draft and final decisions, the amounts set out in the draft decision are not directly comparable with the final decision. This table removes gifted assets from the initial proposal and the draft decision so that it is comparable with Endeavour Energy's revised proposal. The change that we have adopted to the treatment of gifted assets for the final decision does not change the underlying analysis set out in our draft decision.

B.7.2 Revised proposal

Endeavour Energy's revised proposal of \$282.8 million (\$2013–14) is lower than its initial proposal. In developing its revised forecast, Endeavour Energy:

- accepted our reduction to its high voltage feeder augmentation forecast based on a reduction in demand forecasts.⁹³
- reviewed its original proposal to determine whether further efficiencies could be found. This resulted in \$45.5 million (\$2013-14) worth of capex reductions based on more comprehensive risk-based assessments:
 - a \$33.9 million reduction to its high voltage network forecast based on identified program efficiencies and forecast reductions in peak demand⁹⁴
 - a \$14.5 million reduction to its low voltage network forecast based on a review of its planning standards which gave Endeavour Energy a better understanding of the risk associated with excess load on individual substations.⁹⁵
- reviewed the composition of the balancing item contained in its reset RIN and determined that two elements may be appropriately classified as augex:
 - \$5.7 million to purchase land on which zone substations to supply greenfields development will be constructed⁹⁶
 - \$4.3 million to augment assets in conjunction with the relocation of existing assets (in which the relocation of the asset is fully funded by a third party).⁹⁷

While Endeavour Energy reduced its augex proposal in response to our draft decision, it does not agree with the outcomes and reasoning within our draft decision. In particular, Endeavour Energy made the following submissions on two aspects of our draft decision.

First, Endeavour Energy considered that our 15 per cent reduction to the total augex forecast, based on findings from consultant WorleyParsons, is not reasonable unless a systemic and significant flaw is identified in its forecasting process.⁹⁸ WorleyParsons advice was based on the review of the business case for the Distribution Works

⁹³ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 10

⁹⁴ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 11

⁹⁵ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 11

⁹⁶ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 3

⁹⁷ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 3

⁹⁸ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 11

Program. Endeavour Energy considers that its business cases demonstrate that it has adopted risk-based cost-benefit analysis for its other programs that were not reviewed by WorleyParsons.⁹⁹

Second, Endeavour Energy considers that our observations in the draft decision that there is excess capacity within the localised growth areas in the network (and hence augmentation requirements are likely overstated) are not applicable to its augex forecast.¹⁰⁰ The largest localised growth areas are the North West and South West Sydney greenfields developments. Endeavour Energy accepts that the existing substations serving these areas have excess capacity; however, it states that these substations are between 4km and 11 km from the growth areas. It submits that voltage regulation will likely become unacceptable at these distances given the expected increase in demand and load density, and it is more cost effective to establish new zone substations closer to the areas rather than establish new feeders from existing substations.

In addition, in our draft decision, we noted that AEMO's 2014 results of its value of customer reliability (VCR) review show that VCR is on average lower than the previous 2007 review. We noted that Endeavour Energy's augex forecasts were made in advance of the changes to the VCR and stated our expectation that Endeavour Energy would assess the impact of the new VCR on its revised regulatory proposal for augex in particular.¹⁰¹

Endeavour Energy submits that the VCR has limited usefulness when servicing greenfield development" because of the 'lumpy' nature of the investment.¹⁰² It further noted that for residential customers AEMO's VCR results actually increase from the previous review. Given that the majority of Endeavour Energy's augex is for residential greenfields developments, it submits that the VCR results would suggest that augmentation will occur sooner than it otherwise might have been using the previous VCR.¹⁰³ However, Endeavour Energy states that it has not sought to increase their augex forecast on this basis.¹⁰⁴

⁹⁹ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 11

¹⁰⁰ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 8

¹⁰¹ AER, Draft Decision, *Endeavour Energy distribution determination, 2015-16 to 2018-19, Attachment 6: Capital expenditure*, November 2014, p. 42

¹⁰² Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, p. 125

¹⁰³ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 6

¹⁰⁴ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, p. 125

B.7.3 AER approach

In our draft decision of Endeavour Energy's augex forecast, we applied three assessment techniques:¹⁰⁵

- trend analysis, comparing the proposed augex with historic expenditure levels, taking into account changes in demand, network capacity and design and planning standards;
- an engineering review of Endeavour Energy's forecasting processes and methodology undertaken by our consultant, WorleyParsons; and
- the augex model to generate trends in network utilisation.

The key drivers for the difference between our draft decision and Endeavour Energy's initial forecast were the:

- likely ability for Endeavour Energy to make further savings by building on the improved forecasting techniques that it had already applied to its Distribution Work Program. This was supported by advice from WorleyParsons for Endeavour Energy that suggested prudent augex savings of between 10 and 20 per cent during the 2014–19 period. These savings could be made through the greater use of risk-based assessments to new and ongoing programs of work following the removal of deterministic planning criteria from Endeavour Energy's Distribution Licence Conditions on 1 July 2014. Our draft decision applied a 15 per cent reduction to Endeavour Energy's augex forecast in light of this advice.
- downwardly revised demand forecast that was reflected in our estimate of the high voltage (HV) feeder expenditure. We applied a linear adjustment to the HV feeder forecast, based on revised spatial demand forecasts from Endeavour Energy which suggested a 12.8 per cent decrease in forecast demand (calculated using 'ratcheted demand' analysis). This linear reduction was based on evidence provided by one of Endeavour Energy's peers, Ausgrid, of a linear relationship between demand and its HV feeders expenditure.
- We concluded also that Endeavour Energy proposed augex forecast may be higher than it requires to meet localised demand growth in its network based on observations in network utilisation and capacity.¹⁰⁶

Submissions from AGL, Origin, the Energy Retailers' Association of Australia (ERAA) and the Energy Markets Reform Forum (EMRF) endorsed our draft decision:

- AGL submitted that it supported our draft decision because it is hard to justify that Endeavour Energy requires high levels of capex given that they are facing no demand or energy growth in the 2009–14 period.¹⁰⁷

¹⁰⁵ AER, Draft Decision, *Endeavour Energy distribution determination, 2015-16 to 2018-19, Attachment 6: Capital expenditure*, November 2014, p. 45

¹⁰⁶ AER, Endeavour Energy distribution determination 2014-19 draft decision, Attachment 6, pp. 49-57

¹⁰⁷ AGL submission on NSW DNSPs draft decision, p. 2

- Origin submitted that our alternative program represents the most representative alternative that meets the capex criteria as set out in the NER. In support of this, it supports our view that the excess capacity in the network needs to be utilised before supporting further augmentation and agree with our approach to apply a ratcheted demand to provide an indication of the potential need for augmentation.¹⁰⁸
- The ERAA submitted that our alternative program better reflects the capex criteria set out in the NER. In support of this the ERAA stated that the improvements in network utilisation, coupled with downgraded demand and security of supply requirements, should drive an observable reduction in the amount of required capex over the 2014–19 period.¹⁰⁹
- The EMRF questioned why Endeavour Energy has reduced its augex from its initial proposal, based on applying the rigour of our analysis in the draft decision, while also stating in the revised proposal that we were wrong in its approach.¹¹⁰ The EMRF noted that we undertook a number of studies (benchmarking, trend analysis, utilization studies, review of forecasting methodology, VCR impacts and a modelling of augex needs based on inputs) that all delivered similar results and contradicted Endeavour Energy's augex forecast.¹¹¹

However, the Energy Users Association of Australia (EUAA) submitted that we should adopt further reductions to Endeavour Energy's augex proposal.¹¹² In support of this, EUAA submitted that:

- We should substitute Endeavour Energy's demand forecasts with forecasts provided by credible independent forecasters. It notes that Endeavour Energy's augex is built on demand forecasts that are not supported by independent forecasting from AEMO.¹¹³
- We did not quantify the impacts of Endeavour Energy's excess capacity and did not demonstrate that it has been appropriately considered in our augmentation capex assessments.¹¹⁴
- Whilst there are likely to be areas in the networks that have genuine capacity expansion needs, the EUAA does not consider that our assessment process has appropriately scrutinised the networks' augmentation capex justifications.¹¹⁵
- Our adjustments to address the implications of the reduced reliability standards (as reflected in the removal of deterministic planning criteria from the licence condition)

¹⁰⁸ Origin submission on NSW DNSPs draft decision, pp. 10-12

¹⁰⁹ ERAA submission on NSW DNSPs draft decision, p. 2

¹¹⁰ EMRF submission on NSW DNSPs draft decision and revised proposals, p. 60

¹¹¹ EMRF submission on NSW DNSPs draft decision, p. 59

¹¹² EUAA submission on NSW DNSPs draft decision, p. 34

¹¹³ EUAA submission on NSW DNSPs draft decision, p. 31 and 34

¹¹⁴ EUAA submission on NSW DNSPs draft decision, p. 32

¹¹⁵ EUAA submission on NSW DNSPs draft decision, p. 31

do not sufficiently reflect the Endeavour Energy's reduced reliability-capex requirements.¹¹⁶

Our final decision on Endeavour Energy's demand forecasts is set out in Appendix C. In summary, we are satisfied that the demand forecasts for the 2014–19 period proposed by Endeavour Energy in its regulatory proposal (May 2014) reasonably reflect a realistic expectation of demand.

In relation to the use of the network capacity trend, in our draft decision we used trends in network utilisation rates in order for us, as well as stakeholders, to gain a broader understanding of trends over time particularly against aggregated augex trends. On the basis of these observations, we sought further detailed analysis based on a technical review by our consultants WorleyParsons. Our reductions to Endeavour Energy's augex forecast were based on the findings of this technical review. In this final decision, we also have not made any specific adjustments based on our utilisation analysis.

In relation to the technical review, we have reassessed our conclusions based on further evidence submitted by Endeavour Energy in its revised proposal (as discussed in detail below) in relation to the efficiencies that Endeavour Energy can achieve through risk-assessed cost benefit analysis.

Finally, we have considered the additional capex that was previously within its balancing item and unallocated to augex.

B.7.4 AER augex findings

Risk assessed cost benefit analysis

Endeavour Energy has reviewed its augmentation programs and identified additional efficiencies based on risk-assessment cost-benefit analysis and changes forecast demand. It appears that Endeavour Energy's approach to cost-benefit analysis largely explains the difference between our substitute estimate in our draft decision and its forecast augex in its revised proposal. The remaining difference is explained by the capex that was previously allocated to the balancing item, as discussed further below.

First, Endeavour Energy does not adjust its greenfields development forecast. It submits that its forecast already recognises the removal of deterministic planning criteria from its licence conditions.¹¹⁷ The capex program also includes probabilities for each greenfield project based on its assessment of the likelihood of the development proceeding within the 2014–19 period.¹¹⁸ Because of this, Endeavour Energy states

¹¹⁶ EUAA submission on NSW DNSPs draft decision, p. 33

¹¹⁷ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 11

¹¹⁸ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 11

that the application of any further efficiencies would negatively impact on its ability to service these new developments in a timely manner.¹¹⁹

We note that WorleyParsons identified the points made by Endeavour Energy that its greenfields capex forecast includes the application of probabilities and the recognition of the revised licence conditions.¹²⁰ However, WorleyParsons did not specifically identify whether it is appropriate to reduce this forecast based on its findings for the Distribution Works Program. We consider that the techniques applied by Endeavour Energy for its greenfields forecast generally reflect prudent consideration of risk-based cost-benefit analysis. On this basis, if we were to sustain our draft decision and apply a top down 15 per cent reduction to this forecast, it is unlikely to reflect Endeavour Energy's efficient and prudent capex requirements given a realistic expectation of the demand forecast and cost inputs.

In addition, as noted above, our draft decision stated that there is excess capacity in the existing substations that currently serve the proposed growth areas in Endeavour Energy's network. Based on this analysis, we considered that the need for augmentation in these growth areas is likely overstated and this supported our 15 per cent reduction. Endeavour Energy in its revised proposal submits in response that the augmentation requirements are driven not just by capacity constraints, but by distance of these growth areas from the existing substations (between 4km and 11km). This distance means that additional feeders are required to effectively manage voltage levels given the expected growth in demand. Endeavour Energy submits that investing in additional feeders over this distance is less cost-effective than creating a new substation close to the growth areas.

While our analysis of zone substation utilisation provided a valuable insight into the trends in network capacity, we accept that it did not accurately account for the underlying drivers of the augmentation to these areas. In particular, it did not account for the cost-benefit of alternative options to supply the specific growth areas in Endeavour Energy's network. For this reason, we did not make an adjustment based on our utilisation analysis to assess Endeavour Energy's augmentation requirements in its network growth areas and have adopted the same approach in this final decision.

Second, Endeavour Energy submits that a component of its forecast is based on completing projects that were initiated within the 2009–14 period, and it has not made any efficiency adjustments to these projects.¹²¹ WorleyParsons identified that two of these carry-over projects were reviewed and re-scoped based on cost-benefit analysis

¹¹⁹ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 11

¹²⁰ WorleyParsons, *Review of proposed augmentation capex in NSW DNSP regulatory proposals 2014 - 2019*, 17 November 2014, p. 5

¹²¹ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02, p. 11

in light of the revised licence conditions and VCR assessment techniques.¹²² We consider it would not be prudent to re-scope, and potentially defer, projects that are already in-progress and some close to completion. Because our 15 per cent reduction did not accurately reflect the specific projects that are already under construction by Endeavour Energy, our adjustment may have been overstated.

In light of our review of the further evidence submitted by Endeavour Energy, we accept that a top down 15 per cent reduction to Endeavour Energy's overall augex forecast is unlikely to reflect Endeavour Energy's efficient and prudent capex requirements given a realistic expectation of the demand forecast and cost inputs. We have therefore modified our position from the draft decision. We accept that the reductions proposed by Endeavour Energy in its revised proposal reasonably reflect efficient reductions based on the application of risk-assessed cost-benefit analysis for the 2014–19 period.

Balancing item reallocated to augex

Endeavour Energy has included an additional \$9.7 million (\$2013–14) in augex that was previously within its balancing item and unallocated to augex. We did not consider this capex as part of our assessment of Endeavour Energy's initial augex proposal. It appears that this additional capex explains the remaining difference between our substitute estimate in our draft decision and its forecast augex in its revised proposal. For the reasons set out below, we accept this additional augex and have included it in our alternative estimate.

In relation to the \$5.7 million (2013–14) to purchase land to build zone substations in greenfield developments, this capex is part of Endeavour Energy's overall program to augment in its network in growth areas of its network. As discussed above, we accept Endeavour Energy's proposed capex for this program. Therefore, we also accept the additional capex to purchase land as part of this program.

In relation to the \$4.3 million (\$2013–14) to augment assets in conjunction with the relocation of existing assets, this appears to be driven by the need to augment the shared network in response to a third-party funded connections capex. Because asset relocations are subject to the NSW connections contestability framework, the capex for these services are not regulated by the AER and are not funded through this regulatory determination. However, it is possible that augmentation of the shared network may be necessary in response to the asset relocation (and this would be funded through the regulated capex allowance).

Because this capex is driven by connections activities, it would typically be included within the connections allowance. We accepted Endeavour Energy connections capex forecast, and on this basis the additional capex is likely reasonable. However, it is possible that the capex is also driven by demand or other augex drivers such as

¹²² WorleyParsons, *Review of proposed augmentation capex in NSW DNSP regulatory proposals 2014 - 2019*, 17 November 2014, p. 5

reliability and power quality. In the absence of further information from Endeavour Energy, we have included this capex within our alternative estimate of augex. However, in future decisions we will scrutinise more closely whether the primary drivers of this type of capex is connections or augmentation.

B.8 AER findings and estimates for connections and contributions

The contestability framework in New South Wales allows customers to choose their own accredited service provider and negotiate efficient prices for connection services. Given the competition between service providers, we do not regulate the majority of connection services in New South Wales. There is, however, a cost involved in augmenting and extending the shared networks to connect new commercial and industrial sites and multi-unit residential developments. These costs, referred to as 'connections' in this decision, are regulated and funded by all consumers.

In NSW, capital contributions are made up of the value of assets constructed by third parties which are then gifted to Endeavour Energy to be operated and maintained. These contributions are subtracted from total gross capex and as such decrease the revenue that is recovered from all consumers.

B.8.1 Position

We accept Endeavour Energy's revised proposal for connections capex of \$77.2 million (\$2013–14). Similarly, we accept Endeavour Energy's proposed forecast for capital contributions of \$407.5 million (\$2013–14).

Our draft decision accepted Endeavour Energy's proposed connections forecast and customer contributions forecast. We accepted the forecast after considering trends relative to recent expenditure and our assessment that the forecast was consistent with expected construction activity in NSW. Our draft decision set out our full reasons for accepting the Endeavour Energy's forecasts.

The Energy Users Association of Australia (EUAA) notes the uncertainty in the NSW networks' customer connection forecasts, acknowledging that we have received various submissions challenging the assumptions of the underlying forecasts.¹²³ We still consider that forecast dwelling growth and construction expenditures are reasonable proxies for growth in connection services. In this final decision, we maintain our view that both the connection and customer contribution forecasts are reasonable, having regard to the trend of construction activity in NSW. Endeavour Energy has not altered its connections forecast from the initial proposal, except for adjustments to reflect the removal of gifted assets. In this final decision we maintain our view that both the connection forecasts are reasonable having regard to the trend of construction activity in NSW.

¹²³ EUAA submission on NSW DNSPs draft decision pp. 34–35.

Endeavour Energy increased its proposed capital contributions of \$407.5 million from the \$356.9 million (\$2013–14) that we approved in our draft decision. Endeavour Energy revised its forecast of capital contributions in light of the latest information of new estates. We accept Endeavour Energy's revised capital contributions as we consider it is not inconsistent with the trend of construction activity in NSW.

B.9 AER findings and estimates of replacement expenditure

Repex is driven by a service provider's need to replace its assets. In the long run, a service provider's assets will no longer meet the requirements of the network and need to be replaced, refurbished or removed.¹²⁴ Replacement may occur when an asset fails, or a condition assessment may find it is likely to fail soon and replacement is the most economic option. It may also occur because jurisdictional safety regulations mean it can no longer be safely operated on the network, or because the risk of using the asset exceeds the benefit of continuing to operate it on the network.

In general, the majority of network assets will remain in efficient use for far longer than a single five year regulatory period. As a consequence, a distributor will only need to replace a portion of its network assets in each regulatory control period. The majority of its assets will remain in commission beyond the end of the period, and be replaced in subsequent regulatory periods.

Our assessment of repex seeks to establish what portion of Endeavour Energy's assets requires replacement over the 2014–19 period, and the associated expenditure.

B.9.1 Position

We accept Endeavour Energy's revised proposed repex. We have therefore included in our alternative estimate of overall total capex an amount of \$664.5 million (\$2013–14), excluding overheads. We are satisfied that this amount reasonably reflects the capex criteria.

B.9.2 Revised proposal

Endeavour Energy included \$664.5 million, excluding overheads, for repex in its revised proposal which represents a reduction on the \$661.1 million included in our draft decision. Endeavour Energy initially proposed a repex forecast of \$740 million, excluding overheads. A breakdown of Endeavour Energy's revised proposed repex is set out in Table B-2.

¹²⁴ Assets may also be replaced due to network augmentation. In these cases the primary reason for the asset expenditure is not the replacement of an asset that has reached the end of its economic life, but the need to deploy new assets to augment the network, predominantly in response to changing demand.

Table B-2 Endeavour Energy revised repex (million, \$2013–14)

	Endeavour initial (corrected) proposal ¹²⁵	AER draft decision	Endeavour revised proposal
Modelled expenditure	515	519	515
SCADA expenditure	108	25	61.5
Other un-modelled expenditure	117	117	72.4
Total repex	740	661	648.9
Essential spares purchase	7.3		7.3
Total repex (corrected)	747.3		656.2 ¹²⁶

Source: Endeavour Energy, Revised regulatory proposal – 1 July 2015 to 30 June 2019, Attachment 5.03, Response to AER decision on replacement expenditure, January 2015, p. 12.

In its revised proposal Endeavour Energy accepted the outcome of our modelling of particular repex categories.¹²⁷

It disagreed with our draft decision adjustments to its proposed SCADA forecast expenditure but nonetheless significantly lowered its SCADA forecast, in light of the latest information it has on network needs and asset condition, from \$108 million in its initial proposal to \$61.5 million.¹²⁸

Endeavour Energy also considered that the AER's treatment of unidentified expenditure (referred to as the balancing item) included in its RIN was not appropriate. In our draft decision we were unable to determine the composition of the balancing item and therefore allocated this item across the assessed categories of expenditure. Endeavour Energy noted that this item included specific elements that, while not strictly meeting the AER's definitions, could be considered as either augex or repex and are more appropriately considered in these categories. In particular, there were two elements of the balancing item which Endeavour Energy considered are most appropriately categorised as repex:¹²⁹

1. *spares purchase*: this is expenditure on maintaining a stock of essential spares items that are critical to the operation of the network and that are not readily available in the event of a failure. Endeavour Energy considered that this is repex because expenditure is required to replace items from the essential spares stock after an equipment failure. Endeavour Energy submitted that its initial proposal

¹²⁵ Endeavour Energy has corrected its initial proposal to include \$7.3m for spares that was previously allocated to the balancing item in the RIN.

¹²⁶ Endeavour Energy clarified its revised proposal is \$664.5.

¹²⁷ Endeavour Energy, Revised regulatory proposal, January 2015, p.126.

¹²⁸ Revised proposal, attachment 5.03, p. 11.

¹²⁹ Endeavour Energy, Revised regulatory proposal, January 2015, p.128

included an amount of \$7.3 million for the 2014–19 period which it still considers is appropriate.

2. *double counted expenditure*: Endeavour Energy identified two areas where expenditure was inadvertently included in both repex and augex:
 - expenditure of \$30.1 million was double counted as repex and included in un-modelled expenditure, associated with the provision of the alternate control service public lighting
 - expenditure of \$12 million was double counted as both augex and repex (and as repex assessed by us as un-modelled expenditure). This arose when, for the purpose of delivery efficiency, the scope of a major replacement project included identified augmentation works on the associated network.¹³⁰

Endeavour Energy's adjustments to these balancing items for double counting of expenditure resulted in a revised forecast for other un-modelled repex from \$117 million in its initial proposal to \$72.4 million in its revised proposal, compared to our draft decision estimate of \$117 million.

B.9.3 AER approach

In our draft decision, we applied several assessment techniques to assess Endeavour Energy's forecast of repex against the capex criteria. These techniques were:

- analysis of Endeavour Energy's long term repex trends and consideration of various comparative performance indicators of repex performance between NSPs
- predictive modelling of repex requirements
- technical review of Endeavour Energy's approach to forecasting, costs, work practices and risk management; and
- consideration of various asset health indicators.

These assessment techniques revealed that our forecast repex estimate of \$661.1 million would reasonably reflect the efficient costs of a prudent operator. It also would provide Endeavour Energy with a reasonable opportunity to recover at least its efficient costs. We also considered that this expenditure allowance would minimise the potential for Endeavour Energy to over-invest or under-invest in repex during the 2014–19 period.¹³¹

¹³⁰ Endeavour Energy, Revised regulatory proposal, January 2015, attachment 5.03, p. 12.

¹³¹ AER, draft decision, Endeavour Energy distribution determination 2015-16 to 2018-19, Attachment 6: Capital expenditure, November 2014, p.6-65, 6-66.

B.9.4 AER repex findings

Endeavour Energy's lower modelled repex of \$515 million coupled with its reductions in proposed expenditure for SCADA, network control, protection and other repex provides a total repex amount of \$664.5 million which is not materially different to our draft decision estimate of repex. Therefore, for the reasons set out in our draft decision together with our further consideration of the additional information provided by Endeavour Energy, we consider that Endeavour Energy's proposed repex reasonably reflects the efficient costs of a prudent operator given a realistic expectation of the demand forecast and cost inputs.¹³²

Predictive modelling

In our draft decision, we used predictive modelling to estimate how much repex Endeavour Energy is expected in the future, given how old its current assets are, and based on when it is likely to replace the assets.

In our draft decision we were satisfied that an amount of \$519 million of repex is a reasonable estimate for the categories of repex that were subject to our predictive modelling.¹³³

In its revised proposal, Endeavour Energy resubmitted its original forecast of \$515 million for these categories of repex.¹³⁴ Endeavour Energy submitted that '[f]or the asset groups assessed utilising the repex model we accept this approach and the AER's findings.'¹³⁵

For the reasons set out in our draft decision, we accept Endeavour Energy's proposed amount of \$515 million as it is not materially different to the outcome of our assessment of modelled capex.¹³⁶

Un-modelled repex

We accept Endeavour Energy's revised forecast of its un-modelled repex. Overall, it represents a significant reduction in its forecast repex which, when combined with its forecast of modelled repex, is commensurate with our alternative estimate. We consider that it reasonably reflects the efficient costs of a prudent operator given a realistic expectation of demand and cost inputs.

¹³² AER, Draft decision, Endeavour Energy distribution determination 2015-16 to 2018-19, Attachment 6: Capital expenditure, November 2014, pp. 6-65-66

¹³³ AER, draft decision, Endeavour Energy distribution determination 2015-16 to 2018-19, Attachment 6: Capital expenditure, November 2014, p.6-88.

¹³⁴ Endeavour Energy, Revised regulatory proposal, January 2015, p.128

¹³⁵ Endeavour Energy, Revised regulatory proposal, January 2015, p.126.

¹³⁶ AER, draft decision, Endeavour Energy distribution determination 2015-16 to 2018-19, Attachment 6: Capital expenditure, November 2014, pp 6-82-88

Endeavour Energy reduced its proposed expenditure for 'other repex' from \$117 million in its initial proposal to \$72.4 million. This reflects the removal of duplicated expenditure in the balancing item. We accept this as prudent. We also consider that the \$7.3 million for spares is reasonable. This amount is also included in 'other repex'.

The other part of its unmodelled repex is for SCADA, network control and protection expenditure. Endeavour Energy has reduced this significantly from \$108 million in its initial proposal to \$61.5 million. This reflects a 43 per cent decrease from its initial proposal. We consider that this decrease when assessed as part of the overall reduction in repex is indicative of a more prudent approach to forecasting efficient costs in general. Endeavour Energy explained that its revised proposed SCADA, protection and control expenditure includes expenditure which reflects increased expenditure for some aspects of this category:¹³⁷

- pilot cable replacement
- remote terminal unit (RTUs) replacement
- protection replacement.

An examination of the business case in relation to RTUs indicates that this proposed expenditure does not appear to be a significant driver of the proposed expenditure increases.¹³⁸ In relation to pilot cables Endeavour Energy submitted a business case in support of its revised proposal.¹³⁹ We note that this business case considers that this investment will provide ongoing reliability of protections systems and a number of secondary benefits.¹⁴⁰ Endeavour Energy also referred to evidence of the impact of failed pilot cables. Endeavour Energy also provided supporting information in relation to protection repex. In particular, Endeavour Energy submitted that this increased repex is driven by the following:¹⁴¹

- these assets have not been replaced in prior periods and have reached the end of their design life; and
- to upgrade the older protection relays on distribution feeders due to safety considerations.

We note that the supporting business case for pilot cables does not identify failure rates, including options analysis to support the proposed expenditure and that the information on protection expenditure is limited. However, on balance, this has not impacted on our acceptance of this proposed expenditure, given that at a broad level Endeavour Energy has significantly reduced its revised estimate of un-modelled repex and its overall revised repex estimate is not materially different to our alternative estimate.

¹³⁷ Endeavour Energy, Revised proposal, January 2015, pp.12-128

¹³⁸ Endeavour Energy, Attachment 5.06

¹³⁹ Endeavour Energy, Attachment 5.06, January 2015

¹⁴⁰ Endeavour Energy,

¹⁴¹ Endeavour Energy, Revised proposal, January 2015, p.128

B.10 AER findings and estimates of reliability improvement capex

Reliability improvement capex includes capex to meet network reliability performance obligations set out in Endeavour Energy's licence conditions.

B.10.1 Position

We accept Endeavour Energy's revised proposal in respect of the forecast reliability capex and have included it in our alternative estimate.

In its revised proposal Endeavour Energy proposed \$24.4 million (excluding overheads) in reliability improvement capex.¹⁴² This is a 52 per cent reduction from the initial proposal of \$54.8 million (excluding overheads).

In our draft decision, we did not accept Endeavour Energy proposed expenditure of \$37 million (excluding overheads) because:¹⁴³

- A review of Endeavour Energy's supporting information did not indicate the amount and the basis for the amount proposed to address any compliance issues related to the Schedule 3 licence conditions (that is, individual feeders performance obligations)
- It appeared that the proposed amount included expenditure to avoid penalties under the STPIS; and
- The amount proposed had not been allocated in such a way that enabled us to identify whether the amount already formed part of our analysis of other capex driver categories.

In its revised proposal, Endeavour Energy submitted that it had provided sufficient detail for us to understand the allocation of these costs.¹⁴⁴

Endeavour Energy also clarified that the expenditure is required to address compliance issues related to its obligations in relation to the Schedule 3 licence conditions and worst served customers.¹⁴⁵

We have re-examined the allocation of these costs and now accept that Endeavour Energy separately allocated these costs and they were not included in our capex driver assessment (and in particular repex). As such, the cost of undertaking these projects has not been provided for in the repex assessment. We accept that it is separate forecast expenditure.

¹⁴² Endeavour, Revised Regulatory Proposal, p.129

¹⁴³ AER, Draft Decision Endeavour distribution determination 2015-2019, Attachment 6, p. 6-66

¹⁴⁴ Endeavour Energy - 5.04 Response to AER decision on Reliability and STPIS - January 2015. P.12

¹⁴⁵ Endeavour Energy - 5.04 Response to AER decision on Reliability and STPIS - January 2015. P.12

We further examined the program of works proposed by Endeavour Energy and the revised assumptions that Endeavour Energy used to forecast this expenditure in the 2014-19 period. We accept the forecasting approach is reasonable and takes into account historical trends underlying the need for this expenditure.¹⁴⁶

We then considered whether these projects should be funded through the STPIS instead of being included in the estimate of total forecast capex. We do not consider it appropriate for the total forecast capex to fund specific programs of reliability improvement, because these reliability improvements should be funded by the operation of the STPIS. However, it is important to note that the STPIS is based on an average level of reliability. Meeting the Schedule 3 licence conditions involves rectifying specific issues (often on specific feeders), which often only affect a small number of users and rectifying these issues is likely to have a negligible marginal impact on the average reliability levels. Accordingly, the cost of addressing poor reliability on these feeders is not fully recovered through the STPIS scheme.

As such, we are satisfied that it is appropriate to account for these projects in total forecast capex as it will allow Endeavour Energy to meet its regulatory obligations. We consider that, in principle, an adjustment to the STPIS targets should be made to account for the impact this expenditure may have on average performance. However, noting that we expect the impact on the STPIS targets to be small, we are not proposing to make an adjustment to the targets in this case.

On this basis, we are satisfied that the forecast expenditure of \$24.4 million reasonably reflects the capex criteria.

B.11 AER findings and estimates for capitalised overheads

Capitalised overheads are costs associated with capital works that have been capitalised in accordance with Endeavour Energy's capitalisation policy. They are generally costs shared across different assets and cost centres.

B.11.1 Position

Whilst we have concerns with Endeavour Energy's forecast, in the absence of sufficiently robust evidence to the contrary, we accept Endeavour Energy's revised proposal of \$360.6 million (\$2013-14) of forecast capitalised overheads reasonably reflects the capex criteria. We note that we have accepted Endeavour Energy's direct opex forecast and so we do not consider an adjustment to Endeavour Energy's overheads to account for any reduced capital expenditure program is required.

B.11.2 Revised proposal

¹⁴⁶ Endeavour Energy - 5.04 Response to AER decision on Reliability and STPIS - January 2015. P.14

Endeavour Energy's revised proposal included \$360.6 million (\$2013-14) of forecast capitalised overheads, which is unchanged from its initial proposal. Endeavour Energy considered our draft decision was incorrect and contravenes Australian Accounting Standards and the AER approved CAM.¹⁴⁷ Further, it assumed overheads are purely variable costs.¹⁴⁸ Endeavour Energy considers that any reductions to overheads must be made by assessing the costs within this category rather than arbitrarily applying a capped allocation percentage.¹⁴⁹

B.11.3 AER approach

As a logical proposition we consider that reductions in Endeavour Energy's forecast expenditure should see some reduction in the size of Endeavour Energy's total overheads. Our assessment of Endeavour Energy's proposed direct capex, demonstrates that a prudent and efficient distributor would not undertake the full range of direct expenditure contained in Endeavour Energy's revised proposal and it follows that we would expect some reduction in the size of Endeavour Energy's capitalised overheads. We do accept that some of these overheads are relatively fixed in the short term and so are not correlated to the size of the expenditure program. However, we maintain that a portion of the overheads should vary in relation to the size of the expenditure.

In our draft decision we applied an adjustment based on an observed historical ratio of overheads to capital expenditure. However, as a result of submissions on this approach from several distributors, we accept that this approach implicitly assumed that all overheads were variable.¹⁵⁰ Accordingly, we do not consider it appropriate to apply our draft position in the final decision.

We also received a number of submissions which indicated that our draft decision did not accord with the distributors' CAMs or relevant accounting standards (AASB 116). While we do not agree with the issues raised, this point is not key to our position on forecast capitalised overheads in this final decision. We note that a distributor is required to submit a proposal consistent with its CAM. We do not apply the CAM directly as the CAM is not designed to be an assessment technique which we could practically apply in assessing the capex criteria. Similarly, while each of the distributors will need to continue applying AASB 116, our forecast methodology does not need to be explicitly based on this standard.

We have engaged in considerable consultation with Endeavour Energy regarding its overheads.¹⁵¹ We sought to understand how overheads vary with the size of

¹⁴⁷ Endeavour, Revised Regulatory Proposal, p.133

¹⁴⁸ Endeavour, Revised Regulatory Proposal, p.133

¹⁴⁹ Endeavour, Revised Regulatory Proposal, p.133

¹⁵⁰ Endeavour, Revised Regulatory Proposal, p132. Essential, Revised Regulatory Proposal, p.144

¹⁵¹ AER, Info request Endeavour 047 plus follow-ups.

Endeavour Energy's expenditure program and in particular to quantify the proportion of overheads that are fixed and varied. Endeavour Energy submitted that:¹⁵²

we consider Endeavour Energy's total overhead expenditure to be fixed. This also extends to direct capitalised overheads which do not fluctuate and are therefore not dependent on the scope of the capital program. Therefore, prior to the capitalisation of overheads, the costs included in the overhead pool are considered fixed given they represent items such as salaries and wages and other labour related expenditure and IT support contracts, which are independent to the capital program.

In our view, it is unlikely that these costs are wholly fixed. We provided some regression analysis to Endeavour Energy and the other NSW/ACT distributors, which attempted to quantify the relationship between expenditure and capitalised overheads.¹⁵³ Our analysis indicates that some portion of these overheads are variable. However, in response the distributors identified a number of data issues underlying this regression analysis. Endeavour Energy and the other distributors also pointed to non-recurrent overheads and one-off adjustments are present in the historical data, which undermines the trend analysis. Service providers submitted that, factors which undermine this trend analysis include:¹⁵⁴

- accounting adjustments to overhead costs such as year-end adjustments for provisions that account for employee related entitlements should be removed to reveal an underlying overhead cost trend. After removing these adjustments they contend the explanatory power of the regression is poor.
- The relationship does not demonstrate causality and the distributors propose a number of other reasons for the observed relationship.
- Limited number of data points for the regression.

We do not discount our regression analysis entirely, but at this stage accept that it is not sufficiently robust to form the basis of a mechanistic adjustment to Endeavour Energy's capitalised overheads. Without evidence to the contrary, we accept that Endeavour Energy's proposed capitalised overheads reasonably reflect the capex criteria.

B.12 AER findings and estimates for non-network capex

Non-network capex includes capex on information and communications technology (ICT), motor vehicles, buildings and property, and plant and equipment.

¹⁵² Endeavour, Response to AER info request Endeavour Energy 047

¹⁵³ AER, Info request Endeavour 047 plus follow-ups.

¹⁵⁴ AER, *Info request Ausgrid 055 plus follow-up requests*; AER, *Info request Endeavour 047 plus follow-ups requests*; AER, *Info request Essential 047 plus follow-ups requests*; AER, *Info request Actew 061 plus follow-ups requests*.

Endeavour Energy's revised proposal for non-network capex of \$165.7 million (\$2013-14) for the 2014–19 period is a reduction of \$10.7 million from its initial proposal of \$176.4 million.¹⁵⁵ Endeavour Energy adopted the AER's amendments to forecast capex for both the buildings and property and plant and equipment categories of non-network capex. Endeavour Energy stated that:¹⁵⁶

Based on the labour reductions we have achieved over the 2009-14 period and the further reductions targeted in our revised forecast we consider these reductions appropriate. As such we have revised our proposal to reflect the AER's position.

We therefore accept that Endeavour Energy's forecast of non-network capex reasonably reflects the efficient costs that a prudent operator would require to achieve the capex objectives.¹⁵⁷ We have included it in our estimate of total capex for the 2014–19 period.

B.13 AER findings and estimates for other system assets

Other System Assets relate to small capital expenditure items that Endeavour Energy did not allocate to the major capex drivers and these were contained in Endeavour Energy's 'Balancing Item'. We have separately assessed these expenditure items under the category of other system assets.

B.13.1 AER findings and estimates for Other System Assets

Endeavour Energy's revised proposal contained \$20.4 million in other system assets. We do not accept Endeavour Energy's revised proposal of \$17.4 million in technology efficiency capex as it does not reasonably reflect the capex criteria. We consider that \$10.5 million reasonably reflects the capex criteria. We accept \$2.8 million in power quality monitoring and standard control metering reasonably reflects the capex criteria. We note that the technology efficiency capex is one of a few aspects of Endeavour Energy's capex proposal that we do not consider reasonably reflects the capex criteria and this item is not material in the context of the total forecast capex.

In our draft decision this program was unaccounted for capex, which was allocated to augex, connections and repex by the proportion of each driver to total forecast capex. As such, this expenditure item was not individually assessed in our draft decision. Following the explicit identification of this expenditure in Endeavour Energy's revised proposal, we requested additional information to allow us to reassess this proposed expenditure.¹⁵⁸

¹⁵⁵ Endeavour Energy, *Revised regulatory proposal*, 20 January 2015, p. 138.

¹⁵⁶ Endeavour Energy, *Revised regulatory proposal*, 20 January 2015, p. 135.

¹⁵⁷ NER, cl. 6.5.7(c)

¹⁵⁸ Email - AER to Endeavour Energy, 26 February 2015

Technology efficiency expenditure

Endeavour Energy provided a business case for \$10.5 million for a distribution management system.¹⁵⁹ Endeavour Energy identified the need to upgrade its distribution management decision, examined a number of options and selected the lowest option.¹⁶⁰ Having examined this business case we are satisfied that this level of expenditure reasonably reflects the capex criteria.

However, we note that we have received little information justifying the remaining \$6.9 million in technology efficiency expenditure. In response to an information request Endeavour Energy indicated that:¹⁶¹

The other programs noted in that initial presentation have yet to have full business cases to be developed, in part due to the future timing of intended spend where a fulsome business case would be expected closer to the final scoping and with firmer market enquiries to finalise the assessments and confirm final scope of the projects.

We do not consider that we have been provided sufficient information to conclude that this expenditure reasonably reflects the capex criteria.

B.14 Demand management

Demand management refers to non-network strategies to address growth in demand and/or peak demand. Demand management can have positive economic impacts by reducing peak demand and encouraging the more efficient use of existing network assets, resulting in lower prices for network users, reduced risk of stranded network assets and benefits for the environment.

Demand management is an integral part of good asset management for network businesses. Network owners can seek to undertake demand management through a range of mechanisms, such as incentives for customers to change their demand patterns, operational efficiency programs, load control technologies, or alternative sources of supply (such as distributed or embedded generation and energy storage).¹⁶²

The current incentive frameworks and obligations in the NER are designed to encourage distributors to make efficient investment and expenditure decisions. However, the NER recognises that the planning and investment framework and the incentive regulation structure may not be sufficient by themselves to remove any bias towards network capital investment over non-network responses.

¹⁵⁹ Business case DMS 06

¹⁶⁰ Business case DMS 06 and "Use Technology to Provide More Effective Operational Control of the Network.ppt"

¹⁶¹ Email - Endeavour Energy to AER 10 March 2015.

¹⁶² AER, Draft Decision, *Endeavour Energy distribution determination, 2015-16 to 2018-19, Attachment 6: Capital expenditure*, November 2014, p. 74

As such, the NER set out that distributors should examine non-network alternatives when developing network investments through the regulatory investment test for distribution (RIT-D) process. The RIT-D requires distribution network businesses to consult with stakeholders on the need for new capex projects and consider all credible network and non-network options as part of their planning processes. Its aim is to create a level playing field for the assessment of non-network options, such as demand-side management, against network options.

The NER also require us to consider the extent to which a business has considered efficient and prudent non-network alternatives in our assessment of capex proposals.¹⁶³ In addition, the NER require us to develop and implement mechanisms to incentivise distributors to consider economically efficient alternatives to network solutions. As set out in our demand management incentive scheme attachment (attachment 12), we are continuing Endeavour Energy's demand management innovation allowance.

B.14.1 Position

We have maintained our view from the draft decision that it is most appropriate to rely on the incentive framework, together with the requirements in the RIT-D and the distribution Annual Planning Report, to drive the efficient use of demand management. The benefits of capex deferral would be shared with consumers through the CESS.

Accordingly, our alternative estimate of required capex does not include a generic reduction to overall system capex for potential for deferred capital needs through the use of demand management initiatives.

Our decision not to include a generic capex offset for possible future demand management activities does not impact on our consideration of the business cases for specific demand management proposals, or the consideration of non-network alternatives within the RIT-D process. Where a specific capex/opex trade-off can be shown to meet the capex and opex criteria we will include the amounts in the forecasts. This approach is consistent with the capital expenditure factor that requires us to have regard to the extent to which the distributor has considered, and made provision for, efficient and prudent non-network alternatives.¹⁶⁴

B.14.2 Revised proposal on demand management

In its revised proposal, Endeavour Energy notes that it was able to defer \$184 million (\$2013–14) of capex through demand management initiatives during the 2009–14 period, or 9.7 per cent of system capex.¹⁶⁵

¹⁶³ NER, clause 6.5.7(3)(10)

¹⁶⁴ NER Clause 6.5.7(e)(10)

¹⁶⁵ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, p. 136

However, Endeavour Energy suggest that it would be unreasonable to apply a similar explicit reduction to system capex for the 2014–19 period as "the circumstances have changed, in particular reductions to demand and augex primarily relating to greenfield growth means that demand management alternatives will not be as readily available or viable."¹⁶⁶

Endeavour Energy agrees with our position in the draft decision that it is more appropriate to rely on the incentive framework for distributors to utilise demand management where appropriate.

B.14.3 Draft decision position

Distributors are required to transparently consider non-network alternatives through the RIT-D process. Through the RIT-D process and other initiatives developed as part of the demand management innovation allowance, it is expected that some amount of system capex currently in the forecast will be efficiently deferred. In our draft decision, we considered whether it was appropriate to estimate the amount of capex that may be efficiently deferred through the use of demand management initiatives and explicitly reduce the capex forecast by this amount.

In our draft decision, we did not include an explicit capex forecast reduction in anticipation of the deferrals that may be achieved through demand management. Based on the available information, and subject to further input from stakeholders, we formed the view that it was most appropriate to rely on the incentive framework and the RIT-D process to drive the efficient use of demand management. Any capex deferral would be shared with consumers through the CESS.

However, we also provided an analysis of the past performance of one of Endeavour Energy's peers, Ausgrid, who deferred 9.2 per cent of capex during the 2009–14 period through demand management initiatives. We invited stakeholder commentary on whether this estimate should be used to explicitly adjust the capex forecast for the 2014–19 period. We also noted that in order to apply a capex/opex trade-off we would need to assess the efficient opex required to fund the demand management initiatives.¹⁶⁷

B.14.4 Reasons for final decision

We have not received any specific stakeholder commentary on the appropriate capex offset that should be included in the forecast. However, EnerNOC questions the appropriateness of simply removing 9.2 per cent from the capex allowance on the assumption that it ought to be deferrable.¹⁶⁸

¹⁶⁶ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, p. 136

¹⁶⁷ AER, *Draft Decision, Endeavour Energy distribution determination, 2015-16 to 2018-19, Attachment 6: Capital expenditure*, November 2014, p. 76

¹⁶⁸ EnerNOC submission on 2015-19 draft decisions and revised proposals for NSW DNSPs p6

EnerNOC also raises concerns with the approach we sought views on as it suggests that we have reduced capex associated with demand management without allowing the associated opex for demand management initiatives.¹⁶⁹ As set out above and consistent with our consideration of opex step-changes in attachment 7, our position is to only apply a specific capex/opex trade-off where it can be shown to meet the capex and opex criteria. However, we have not applied an additional generic capex offset associated with likely demand management activities.

No other stakeholders provided views on the appropriateness of estimating a generic capex deferral associated with future demand management activities. Therefore, consistent with our position in the draft decision and Endeavour Energy's submission, we are of the view that the efficient capex/opex trade-off is most efficiently discovered through reliance on the incentive framework, together with the RIT-D process.

¹⁶⁹ EnerNOC submission on 2015-19 draft decisions and revised proposals for NSW DNSPs p5

C Demand

The level of expected demand is fundamental to a distributor's forecast capex and opex and our assessment of that forecast expenditure.¹⁷⁰ This appendix sets out our decision on Endeavour Energy's forecast total system demand for the 2014–19 period.¹⁷¹

System demand trends give a high level indication of the need for expenditure on the network to meet changes in demand. Forecasts of increasing system demand generally signal an increased requirement for growth capex, and the converse for forecasts of stagnant or falling system demand.¹⁷² Accurate, or at least unbiased, demand forecasts are important inputs to ensuring efficient levels of investment in the network. For example, excessively high demand forecasts may lead to inefficient expenditure as distributors install unnecessary capacity in the network.

In the draft decision, we accepted Endeavour Energy's forecast while noting our expectation that updated forecasts would be included in the revised proposal.¹⁷³ In this final decision, we find that Endeavour Energy's system demand forecast reasonably reflects a realistic expectation of demand. We formed this view after considering Endeavour Energy's response to our draft decision and considering the trends in the most recent independent demand forecasts prepared by AEMO.

This attachment does not consider localised demand growth (spatial demand) that may drive the need for specific growth projects or programs.

C.1 AER position

We are satisfied that the demand forecasts for the 2014–19 period proposed by Endeavour Energy in its regulatory proposal (May 2014) reasonably reflect a realistic expectation of demand.¹⁷⁴ We acknowledge that demand forecasting is not a precise science and that Endeavour Energy's forecasts will inevitably contain errors. However, the evidence presented to us supports our conclusion.

C.2 AER approach

Our consideration of demand trends in Endeavour Energy's network relied primarily on comparing demand information from the following sources:

- Endeavour Energy's regulatory proposal

¹⁷⁰ NER, clause 6.5.6(c)(3) and 6.5.7(c)(3).

¹⁷¹ In this attachment, 'demand' refers to summer maximum, or peak, demand (megawatts, MW) unless otherwise indicated.

¹⁷² Other factors, such as network utilisation, are also important high level indicators of growth capex requirements.

¹⁷³ AER, Draft Decision, *Endeavour Energy distribution determination, 2015-16 to 2018-19, Attachment 6: Capital expenditure*, November 2014, p 6-116

¹⁷⁴ NER, clause 6.5.6(c)(3) and 6.5.7(c)(3).

- forecasts from AEMO¹⁷⁵
- stakeholder submissions in response to Endeavour Energy's revised proposal (as well as submissions made in relation to the NSW/ACT distribution determinations more generally).

C.3 Endeavour Energy's revised proposal

Endeavour Energy accepted that global peak demand across its network is reducing, however, it noted that global peak demand is not necessarily a useful concept when determining the appropriate level of demand driven investment. As outlined in its regulatory proposal and its revised proposal, Endeavour Energy's augex forecast is primarily driven by greenfield developments. Development in greenfield areas results in localised increases in demand in areas where there is no infrastructure available to service it.¹⁷⁶

The demand forecasts proposed by Endeavour Energy in its regulatory proposal are driven by localised growth as opposed to organic, global demand growth. The forecasts incorporate the latest actual demand data (from summer 2013/14 and winter 2013).

The AEMO forecasted low system demand growth for Endeavour Energy's network and for the NSW region more generally. We note that AEMO had downgraded its demand forecast for the NSW region in its most recent report.¹⁷⁷

Endeavour Energy's regulatory proposal described its demand forecasting methods, including approaches to:

- weather correction
- accounting for spot loads
- accounting for transfers
- accounting for embedded generation.¹⁷⁸

As part of our final decision on system demand forecasts, we compared Endeavour Energy's revised system demand forecast to the sum of AEMO's connection point (CP) forecasts for Endeavour Energy's network.¹⁷⁹

Figure C-1 and Table C-1 provide an overall system level view of Endeavour Energy's revised demand forecasts, the changes made since its regulatory proposal and a comparison of the AEMO forecasts.

¹⁷⁵ AEMO, *National electricity forecasting report for the National Electricity Market*, June 2014, p. 4-4.

¹⁷⁶ Endeavour Energy, *Revised Regulatory Proposal 1 July 2014 - 30 June 2019*, 20 January 2015, Attachment 5.02

¹⁷⁷ AEMO, *National electricity forecasting report for the National Electricity Market*, June 2014, p. 4-4.

¹⁷⁸ Endeavour Energy, *NFB 0010 Network demand forecasting - Summer and winter peak demand forecast process*, 2 November 2012.

¹⁷⁹ AEMO, *Final Transmission Connection Point Forecasts*, October 2014.

Figure C-1 Maximum system demand (summer coincident)

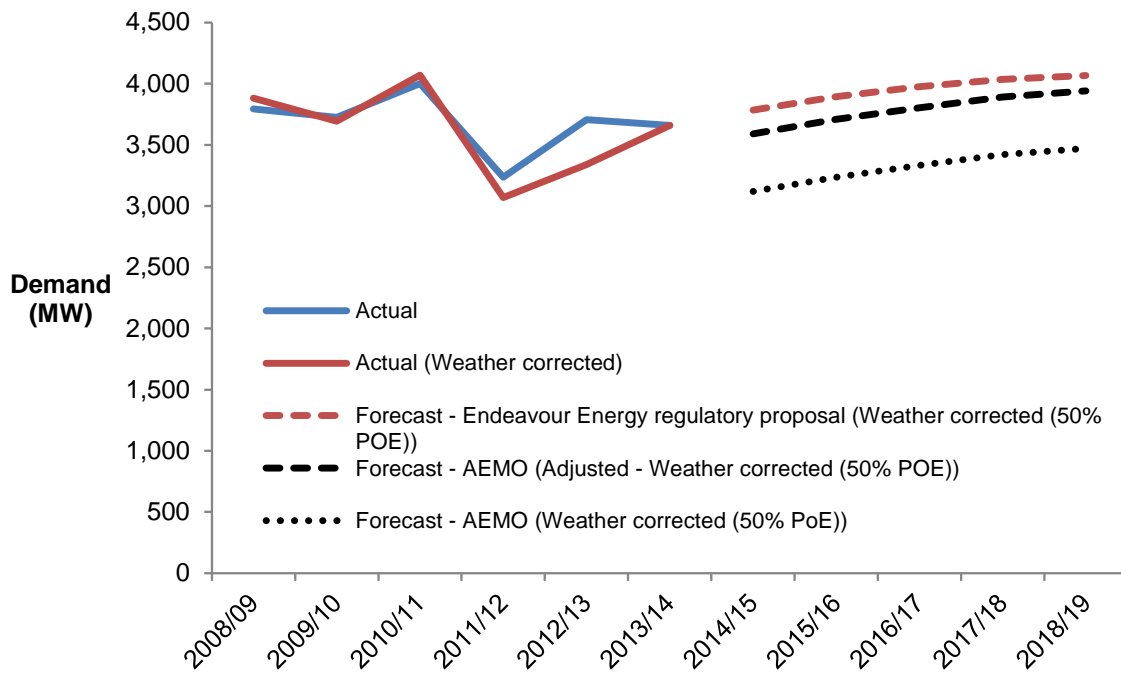


Table C-1 Maximum system demand - Weather corrected (50% PoE) (MW)

	2014-15	2015-16	2016-17	2017-18	2018-19	Average annual growth (2014-19)
Regulatory proposal (May 2014) - Summer	3785	3894	3976	4036	4066	2.13%

C.3.1 AEMO forecasts

In July 2014, AEMO published the first edition of transmission CP forecasts for New South Wales and Tasmania.¹⁸⁰ These forecasts are AEMO’s independent electricity maximum demand forecasts at transmission connection point level, over a 10-year outlook period.¹⁸¹ The Standing Council on Energy Resources (SCER) intended these demand forecasts to inform our regulatory determinations.¹⁸² In addition, AEMO has published the National Electricity Forecasting Report (NEFR) since 2012, and

¹⁸⁰ AEMO, *Transmission connection point forecasting report for New South Wales and Tasmania*, July 2014, p. 6.

¹⁸¹ AEMO, Website: <http://www.aemo.com.au/Electricity/Planning/Forecasting/Connection-Point-Forecasting/Transmission-Connection-Point-Forecasts>, accessed 3 September 2014.

¹⁸² AER, *Better regulation: Explanatory statement: Expenditure forecast assessment guideline*, November 2013, p. 182.

published the latest edition in June 2014 (2014 NEFR).¹⁸³ The NEFR includes AEMO's summer and winter demand forecasts for all regions (states) in the National Electricity Market. More information about the AEMO process is included in our draft decision.¹⁸⁴

Figure C-1 compares AEMO's demand forecasts and the forecasts proposed by Endeavour Energy in its regulatory proposal.¹⁸⁵ Endeavour Energy's growth trend is consistent with AEMO's CP forecasts over the 2014–19 period. This was despite having different datasets and forecasting approaches. Endeavour Energy's demand forecasts show a 2.1 per cent annual increase over the 2014–19 period.

As set out in our draft decision, several stakeholders raised concerns that Endeavour Energy, as well as the other NSW/ACT distributors, were using overly conservative demand forecasts as inputs to their regulatory proposals. That is, many stakeholders considered that the forecasts included in the initial proposal were too high.¹⁸⁶

The Energy Retailers Association of Australia noted that the NSW distributors' revised demand forecasts should drive an observable reduction in the amount of required capex over the 2014–19 period.¹⁸⁷

¹⁸³ AEMO, *National electricity forecasting report for the National Electricity Market*, June 2014.

¹⁸⁴ AER, Draft Decision, *Endeavour Energy distribution determination, 2015-16 to 2018-19, Attachment 6: Capital expenditure*, November 2014, p 6-83

¹⁸⁵ We summed AEMO's coincident demand figures for each CP in Endeavour Energy's network for each year.

¹⁸⁶ AER, Draft Decision, *Endeavour Energy distribution determination, 2015-16 to 2018-19, Attachment 6: Capital expenditure*, November 2014, p 6-86

¹⁸⁷ ERAA, submission on NSW DNSPs draft decision, p. 2