ATTACHMENT 5.03

Response to AER decision on replacement expenditure

Prepared by: Endeavour Energy

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Endeavour Energy

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1.0 Overview

The long term integrity, performance and value of the network is dependent upon, amongst other things, the assets of the network operating within acceptable performance standards. Endeavour Energy seeks to renew, in a timely manner, assets operating outside these parameters due to their condition, the risks they present to the network or their suitability consistent within other corporate objectives of network capability, reliability, safety, performance, economic efficiency and environmental management.

Asset renewal may be performed on like-for-like basis or an alternative basis subject to the broader company objectives and decision making processes. We consider repex a key component of our proposed capital program. Below we set out the framework in which the AER is required to assess our forecast, the assessment the AER have made and our response to this assessment.

2.0 AER obligations

2.1 Assessment approach

In attachment 0.03 of our substantive proposal we noted that the 2012 September Rule change on Economic Regulation of Network Service Providers provided further clarity of the process that the AER should follow when making its decision on expenditure forecasts. The AEMC emphasised the following key principles underlying the assessment process:[1]

- the AER's assessment process must start with a DNSP proposal[2];
- the AER must accept a proposal that is 'reasonable'. The test of 'reasonable' must equally apply to the substitute amount; and
- while the AER's assessment techniques in making its analysis are not limited, the AER must consider the probative value of materials before it.

The AEMC's considerations demonstrate that the regime requires the AER to reflectively contemplate the material put before it by the NSP, and assess the probative value of this information relative to other material such as submissions and analysis undertaken by or for the AER.

Based on this assessment of materials, the AER must accept the proposal if it is reasonable and based on sound reasoning. The AER's substitute value, if it is not satisfied, must also be based on the same principles, once again with reference to the material before it.

2.1 Repex approach

The AER's capital expenditure forecast assessment guideline outlines that the AER will utilise a combination of top down and bottom up modelling of efficient expenditure.

In the guideline the AER outlines that repex is typically required to address the deterioration of assets, including works driven by reliability deteroration or as a result of an assessment of increasing risk. The AER also acknowledges in the guideline the interrelationships with maintenance opex and the trade-offs between these categories of expenditure. The specified approach for repex involves the following assessment techniques:

- analysing information supporting our proposal;
- benchmarking repex with historical levels and/or other DNSPs;
- repex modelling; and
- detailed project review.

[1] In attachment 0.03 of our substantive proposal, we provide further information on the AEMC's considerations, and provide a reference to the decision.
[2] This has also been established by the Australian Competition Tribunal's decision. "(EnergyAustralia) is correct to submit that it is not the AER's role to simply make a decision it considers best. It is also correct for it to say that the AER should be very slow to reject a DNSP's proposal backed by detailed, relevant independent expert advice because the AER, on an uninformed basis, takes a different view."

Of these measures the AER identifies that repex modelling the condition or age-based replacement rates of assets will represent a key input in the analysis and estimating efficient volumes and costs to target more detailed reviews.[3]

In its assessment the AER has utilised the repex model for a significant portion of the forecast. The AER then directly assessed an umodelled repex focussing on trend analysis and step changes. Outside of these asset groups it appears that the AER did not assess the balancing item allocated to repex.

In its decision the AER also presented analysis and views on our repex forecast. It is not clear to what extent these issues were relied upon by the AER in developing a substitute amount but they appear to have supported the rejection of our proposed amount. This analysis focused on risk appetite and management framework, consultant advice and historical benchmarking and trend anlaysis.

Overall, we consider that sufficient information was provided to demonstrate to the AER that our repex program was based on sound asset management practices and governance and well justified. The consequences of any reductions to this program, in terms of safety, reliability and sustainability, have not been considered by the AER.

3.0 AER decision

In its draft determination the AER has rejected Endeavour Energy's proposed repex forecast of $922.8million ($2013-14) and substituted an amount $661.1million ($2013-14) excluding overheads. However, it is not clear what figure the AER's reduction was made to, different amounts are referenced throughout the proposal:

- *"Endeavour Energy proposed $1020.7 million ($2013–14) of forecast repex (after allocation of the balancing item and excluding overheads)…….a reduction of 35.2 per cent.[4]"*

- *"Figure A-8 shows that Endeavour Energy's proposed forecast repex of $992 million ($2013-2014) for the 2014–19 period.[5]"*

- *Endeavour Energy proposed $739.7 million ($2013-14) of forecast repex (excluding capitalised overhead). We do not accept Endeavour Energy's proposal. We have instead included an amount of $661.1 million ($2013–14) in our alternative estimate, a reduction of 10.6 per cent.[6]"*

We note that these figures are sourced from the Determination RIN and AER analysis rather than our regulatory proposal. The different bases from which these numbers are derived is also confusing for stakeholders to understand what reduction has been made and to confirm whether the AER's calculation is accurate.

In analysing the decision, it appears the repex figure before the allocation of the balancing item is the number assessed (i.e. $740million). Section 3.4.1 of the AER's draft decision attachment 6 assesses $515million of the repex and the remaining $225million of "unmodelled repex" is assessed separately. The AER's draft decision substituted $519million and $142million respectively to develop an alternative forecast of $661million, a $76million reduction.

However, the draft decision quotes a reduction of 35.2% to repex based on the repex figure with the balancing item allocated. This percentage is hard coded as a "capex adjustment factor" however it is not clear whether the AER has assessed the $281million allocated to the $740million repex figure. The reduction implies a 100% cut to the $281million however this primarily consists of capital contributions which have been accepted. It therefore appears that the "capex adjustment factor" used by the AER is overstated significantly compared to the reduction made to the portion of the repex forecast the AER has actually assessed.

[3] Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Distribution, November 2013, pg 26
[4] AER Draft Decision Endeavour Energy distribution determination 2015-16 to 2018-19, Overview, November 2014, pg 50
[5] AER Draft Decision Endeavour Energy distribution determination 2015-16 to 2018-19, Attachment 6: Capital Expenditure, November 2014, pg 49
[6] AER Draft Decision Endeavour Energy distribution determination 2015-16 to 2018-19, Attachment 6: Capital Expenditure, November 2014, pg 47

We intend to consult further with the AER post submission of the revised regulatory proposal to clarify this matter. There is a significant difference between the ramifications and reasonableness of a 10.6% and 35.2% reduction. For this reason we have found it difficult to respond to the AER's decision.

In its draft decision, the AER cites the following key reasons for making a reduction to repex:

- *"Endeavour Energy's proposed repex is around 55 per cent higher than its long term average and Endeavour compares unfavourably on a number of benchmarks which take into account Endeavour Energy's network size.*

- *An engineering review carried out by EMCa found that there are systemic issues with Endeavour Energy's forecast that mean its proposal is likely to overstate the amount of repex required to meet the capex objectives. Endeavour Energy is likely to be replacing many assets earlier than is necessary to meet the capex objectives.*

- *There is evidence from an engineering review that there are systemic issues with Endeavour Energy's forecast that mean its proposal is likely to overstate the amount of repex required to meet the capex objectives. Endeavour Energy is likely to be replacing many assets earlier than is necessary to meet the capex objectives.*

- *Our predictive modelling is consistent with Endeavour Energy's proposal for the six asset groups that were modelled. However, for categories that were not included in predictive modelling we were not satisfied that Endeavour Energy's forecast was prudent and efficient and estimated a prudent and efficient substitute that was sufficient to meet the capex criteria.[7]"*

In forming this view the AER's assessment approach relied on trend analysis, an engineering review and repex modelling. Endeavour Energy:

- agrees with the AER's findings for the asset groups assessed using the repex models;

- for the "unmodelled" repex we have not revised our proposal to adopt the full quantum of reductions made by the AER as we consider the "step changes" are supported by detailed analysis;

- for the allocated 'balancing item' we have not revised our proposal to reflect the 100% reduction as we consider it has been made in error; and

- for the issues raised by the AER in assessing repex we have not revised our proposal to address these matters as it is not clear to what extent they have been relied upon nor do we consider them valid.

4.0 Repex response

The AER's assessment has erred in both rejecting our propose repex forecast and developing a substitute amount. In addition to the numerical errors raised in the above section, it appears the AER have relied on a misconception of our proposed repex. Specifically, the AER states the following:

> *"Firstly, 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). It does not combine this with the application of a top-down assessment to check or test whether these estimates are efficient. The drawback of deriving an estimate of*

[7] AER Draft Decision Endeavour Energy distribution determination 2015-16 to 2018-19, Overview, November 2014, pg 50

capex solely by applying a bottom-up assessment is that of itself it does not provide any evidence that the estimate is efficient.[8]"

This view directly contradicts that expressed by the AER's own consultant EMCa, who state:

"At the project/program level, we found that Endeavour takes a conservative approach to applying risk assessment criteria. We also found that, at the portfolio level, decision support methods reflect a high level assessment.[9]"

As articulated in our substantive regulatory proposal and demonstrated by the supporting evidence, Endeavour Energy's forecast repex program is based on a combination of top down and bottom up analysis.

Top-down approach

The VDA model outputs have been used as a high level guide and form the basis each year for setting a landscape against which ground-up expenditure projections are developed. The outputs from the VDA are not applied blindly, but are tested for practicality, realism and impact against strategic targets for asset renewal. This review is undertaken at an asset category level as well as at a whole-of-network level.

A top down assessment approach is generally utilised as a part of developing strategic renewal programs. Strategic renewal is based on proactively replacing assets, sometimes before the absolute end of their lives, in order to manage network risk and the demands on capital and human resources required to carry out the replacement work. A top down approach achieved through asset renewal modelling assists in making strategic replacement decisions.

Bottom-up approach

The detailed asset renewal items outlined in the SARP have been identified by asset engineers and managers from various engineering, asset management and operational groups across the Company. A combination of renewal planning approaches have been used which are consistent with Endeavour Energy's Network Asset Renewal and Network Asset Maintenance policies.

A bottom up approach is generally utilised in developing critical renewal programs. Critical renewal is based on keeping assets in service as long as possible until the asset condition requires action. To rely heavily on critical renewal would mean the timing and management of the overall program could not be optimised or addressed in sufficient time.

Overall, Endeavour Energy's renewal program has been developed using both of these approaches to identify the optimum time and the most efficient manner of renewing individual assets and categories of assets throughout the network. In forming our propsed program we considered and relied on:

- safety, environment and regulatory requirements;
- asset condition;
- suitability of the assets for their function;
- present demand on the asset;
- historical demand placed on the asset over its service life;
- maintenance and service history;
- knowledge of equipment type faults;
- the unique risk relating to those assets; and
- pre-defined criteria that form the basis of asset health index and trigger a flag for asset refurbishment and replacement (for major equipment groups).

Endeavour Energy developed a strategic asset renewal investment planning framework in 2002. The framework, directed and underpinned by Board policy and organisational procedure, has enabled the development tof a robust mechanism for identifying long term asset renewal needs to ensure that a sustainable network asset base is maintained for the benefit of all stakeholders. Appendix 1 provides a more detailed explanation of this framework and Endeavour's approach to asset renewal, including a discussion of its impact on our current repex proposal.

[8] AER Draft Decision Endeavour Energy distribution determination 2015-16 to 2018-19, Attachment 6: Capital Expenditure, November 2014, pg 19
[9] EMCa Technical Review of Regulatory Proposals: Review of Proposed Replacement Capex in Endeavour Energy's Regulatory Proposal 2014-19, October 2014, pg iii

It is not clear how the AER has engaged with our proposal if it has failed to understand our forecasting approach. We contend the AER's decision to reject our proposed forecast was in error to the extent this misconception outlined above was relied upon. However, in setting a substitute forecast it is not clear to what extent this view was relied upon.

4.1 Trend analysis

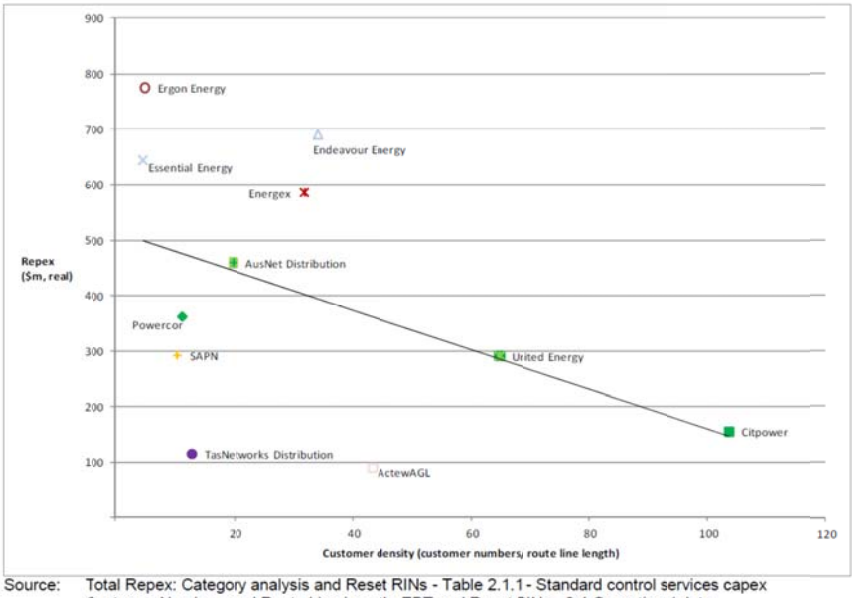
The trend analysis applied by the AER appears to be a mixture of benchmarking and consideration of age profiles and average historical repex. This appears to inform the AER's view that Endeavour's repex is overstated and is reinforced by the outcomes of the other assessment tools used.

The trend analysis used by the AER is simplistic and lacks the accuracy and rigour required to support significant reductions. It is not clear to what extent this analysis informs the AER's assessment and substitute amount. Endeavour Energy do not consider relying on such analysis without consideration of the consequences would provide us an opportunity to efficiently ensure we meet our obligations.

4.1.1 Benchmarking

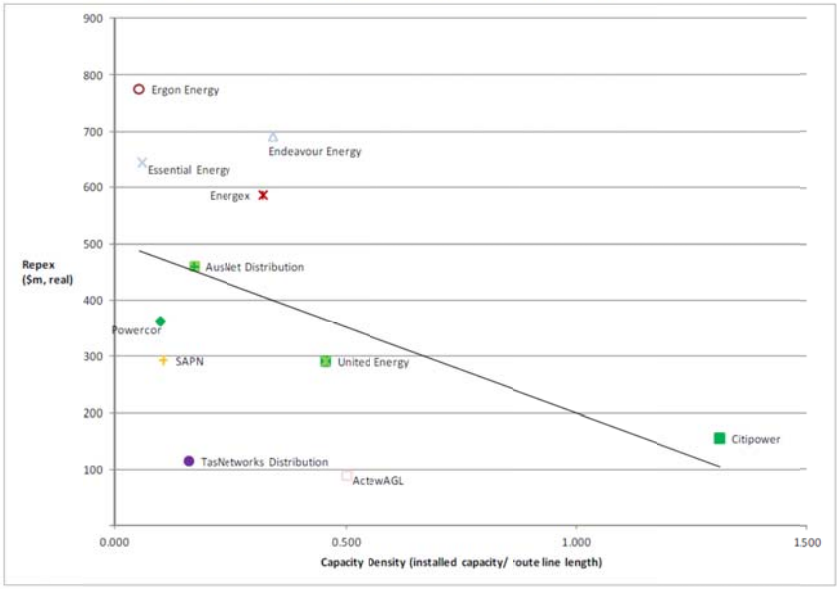
In its repex decision the AER provides benchmarking analysis such as these graphs below:

Figure A-9 Repex across the NEM normalised for customer density



Source: Total Repex: Category analysis and Reset RINs - Table 2.1.1 - Standard control services capex
Customer Numbers and Route Line Length: EBT and Reset RINs - 3.4 Operational data
(Jemena excluded as information is commercial in confidence)
(Ausgrid excluded as it is a significant outlier)

Figure A-10 Repex across the NEM normalised for capacity density



Source: Total Repex: Category analysis and Reset RINs - Table 2.1.1 - Standard control services capex
Installed capacity: EBT and Reset RINs - 3.4 Operational data
(Jemena excluded as information is commercial in confidence)
(Ausgrid excluded as it is a significant outlier)

Based on the analysis above the AER concludes the following:

> *"Endeavour Energy compares unfavourably under both density measures. Further, these measures suggest that predominately rural based networks incur higher repex than urbanised networks. When considering whether a network is relatively rural or urban we have also taken into account the length of lines in commission by feeder type. That is, the length of overhead conductors and underground cables installed on CBD, urban, rural short and rural long feeders. The predominately rural networks have a high proportion of assets on long rural feeders. However, Endeavour Energy has only 0.5 per cent of its assets on rural long feeders (compared to around 50 per cent for the predominately rural networks).[10]"*

Endeavour Energy categorically rejects this benchmarking analysis and the AER's conclusions. This analysis fails a considerable number of the Productivity Commission's six criteria for benchmarking which the AER adopted as benchmarking principles in their guideline.

Specifically, these measures do not account for the significant number of operating and environment factors that may impact on the results. Furthermore, the data relied upon is not comparable or prepared on a similar basis across the DNSPs included nor is the dataset of a sufficient size to form reliable conclusions with. In spite of this, the AER assumes it is measuring efficiency despite the apparent low explanatory power of the variables modelled and unquantified, unknown number of unaccounted factors. In light of the known limitations of this analysis and its prevalence in the AER's repex assessment, we consider the following benchmarking principles have been breached (for repex benchmarking):

- validity;
- accuracy and reliability;
- robustness; and
- fit for purpose.

Refer to Attachments 1.02 to 1.07 for a more detailed response to the AER's use of benchmarking.

[10] AER Draft Decision Endeavour Energy distribution determination 2015-16 to 2018-19, Attachment 6: Capital Expenditure, November 2014, pgs 50-51

4.1.2 Asset age trends

In adopting a long term cost average (discussed below) the AER provide the estimated residual service life profile for Endeavour Energy over the 2006-13 period. This analysis is high level and its use is contrary to the questioning of Endeavour Energy's reliance on the WARL by the AER and EMCa. Irrespective of this, we do not consider the AER have sufficiently sought to understand the trend in this age profile.

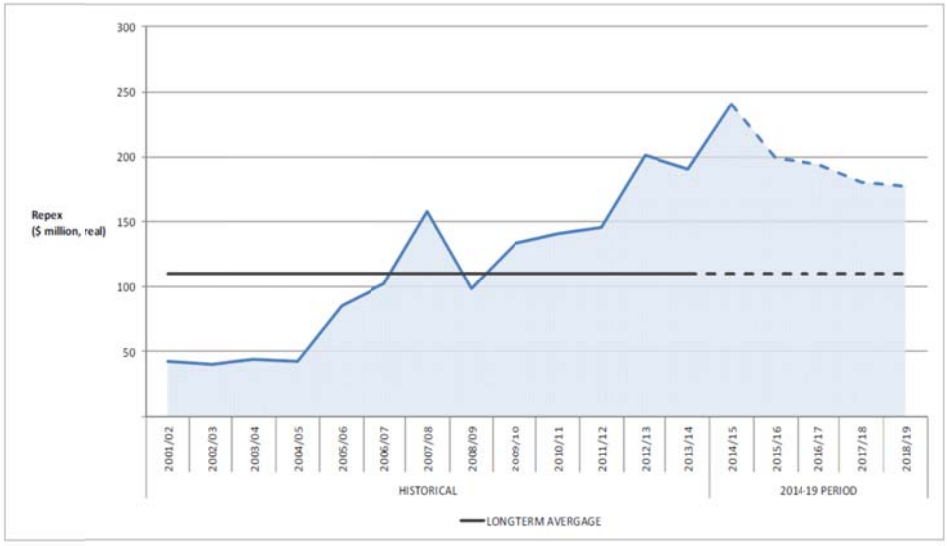
A more detailed explanation the strategic approach to asset renewal that Endeavour Energy has been taking for the last twelve years can be found in the appendix. One of the objectives of our replacement program is to replace assets in such a way as to maintain the weighted average remaining life of the network within a sustainable range.

A WARL that is increasing indicates that the network is becoming younger and is the result of over-investment in the network. Conversely, a WARL that is decreasing indicates that the network is becoming older and is not sustainable in the long term. Endeavour Energy's approach to investment in asset replacement has been to invest at a level that results in a WARL that is neither increasing nor decreasing but which is maintained within the range of 50+/-5%, which represents a sustainable long term outcome. Our repex forecast is the continuation of twelve years of strategic investment in asset replacement and is intended to result in the WARL of our network remaining within the corporate target range.

4.1.3 Historical expenditure

In rejecting Endeavour Energy's proposed repex the AER examine the long term historical repex. The AER considers it unreasonable that our proposed forecast is above this average.

Figure A-8 Endeavour Energy's repex including overheads historic actual and proposed for 2014–2019 period (real $ million June 2014)



Source: Historical: IPART Regulatory Accounts (prior to 2010/11) and AER Annual RINs (2010/11 to 2013/14)
2014–2019 period: Endeavour Energy's Reset RIN, Table 2.1.1 - Standard control services capex (allocating capitalised network and corporate overheads on the basis of repex as proportion of total capex)

> *"Figure A-8 shows that Endeavour Energy's proposed forecast repex of $992 million ($2013-2014) for the 2014–19 period significantly exceeds its long term average. This is a 55 per cent increase above its long term average repex and a 22 per cent increase in the amount actually incurred in the most recent regulatory control period.[11]"*

This average covers the 2001-2019 period to support an asset age profile the AER considers reasonable between the 2006-13 period. This mismatch is illogical, the AER should match the cost average to the age profile the AER considers acceptable. The long term cost average covers a significant period of under-

[11] AER Draft Decision Endeavour Energy distribution determination 2015-16 to 2018-19, Attachment 6: Capital Expenditure, November 2014, pg 49

investment (2001-2006) prior to substantive industry changes (licence conditions). Irrespective of this, there is no consideration or demonstration of why the long term average is a valid benchmark and measure.

We have not revised our proposal to conform to such an average because it will result in unsustainable and unsafe outcomes. This is a simple measure that is significantly less refined than our top down WARL. The AER have failed to consider the implications of this average and justify its reasonableness.

4.2 EMCa findings

In forming its views the AER has relied on an engineering review of the proposed repex forecast. It should be noted that the AER states the review was commissioned to test Endeavour Energy's repex forecast against the capex criteria. However, in its report EMCa do not refer to the capex criteria or provide an assessment in this context, EMCa state:

> *"This report is not intended to be used to support business cases or business investment decisions nor is this report intended to be read as an interpretation of the application of NER or other legal instruments[12]"*

Setting this aside, the AER rely on this report in rejecting and substituting our repex program relying on the following key issues raised in EMCa's report:

> *"Specifically, EMCa found that when estimating replacement expenditure, Endeavour Energy systemically overstates its efficient costs due to:*
>
> - *inadequate options analysis (including lack of cost/benefit analysis) and lack of justification of the timing for resolving the condition-based issues identified and, therefore, the volume and cost of activity proposed for the 2015–19 period;*
> - *inadequate explanation of the degree of step-change evident in expenditure proposed at the subcategory level; and*
> - *inadequate evidence of efficient costs.[13]"*

We consider the EMCa report does not constitute a technical review of our proposal or even a reasonable one. The findings are based on numerous factual and logical errors, unreasonable views and high level analysis that is not supported by evidence. Refer to the table in section 5 of this attachment for a comprehensive and detailed response to the issues raised by EMCa and the shortcomings of the report. To summarise, we do not consider it is of sufficient quality or accuracy to be relied upon by the AER in making its determination.

Conservative approach to risk management

In addition to the detailed response table, we note that EMCa consider that Endeavour Energy has an overly conservative risk appetite. We reject this claim as it is unsubstantiated, and we also question the subjective assessment of what constitutes 'conservative' versus appropriate attitudes to risk.

For instance, many parts of Endeavour Energy coverage areas face above average risk of bushfires. The 2009 Victorian Black Saturday bushfire reinforced that community safety must be paramount in areas susceptible to catastrophic bushfires, like the Blue Mountains. Endeavour Energy instituted a major review of its bushfire risk mitigation measures following the report of the Victorian Bushfire Royal Commission and instituted a number of operational and investment-related measures as a result to ensure that we were adopting an appropriate risk position. Two of the investment programs initiated as a result of that review still exist in the current SARP to mitigate this risk:

- DS011 HV distribution steel mains replacement
- PS009 Installation of SEF relays

[12] EMCa Technical Review of Regulatory Proposals: Review of Proposed Replacement Capex in Endeavour Energy's Regulatory Proposal 2014-19, October 2014
[13] AER Draft Decision Endeavour Energy distribution determination 2015-16 to 2018-19, Overview, November 2014, pg 26

Prioritisation process

EMCa have formed a view that the 20% cut made by our Board to our capex program is evidence that further cuts are possible. They state in their report

> *"…such adjustments need to be adequately informed if they are to ensure that the resulting work program is prudent.[14]"*

A more detailed explanation of the prioritisation process that was used to determine the projects that would be cut from our program given the cut in expenditure is provided in the appendix. In summary, a thorough engineering assessment was undertaken to ensure that we understood the risks associated with the projects and programs that may be removed given varying levels of expenditure reduction. To imply that the 20% reduction was not adequately informed is to misrepresent the process that was followed and does not constitute justification for further cuts to expenditure.

4.3 Repex modelling

In assessing our proposed repex the AER relied on repex modelling for 6 asset groups which equated to $515million ($2013-14). The AER utilised a number of different model calibrations all of which confirmed the amount proposed by Endeavour Energy. The AER therefore substituted an amount of $519million for these asset groups.

> *"Following our modelling, we have concluded that the calibrated model using forecast unit costs leads to an estimate which we consider is the point around which a reasonable range exists. Consequently, we are satisfied that an amount of $519 million of repex is a reasonable estimate of the prudent and efficient capex for the six modelled categories.[15]"*

We consider the AER's reliance on the repex model is consistent with the assessment approach outlined in the guideline. In developing our original forecast we also utilised repex and VDA modelling as a top down assessment tool. Our substantive proposal forecast, while broadly in line with the AER's assessment, was lower than the $519M amount substituted by the AER. Our forecast of $515million represents a replacement program for these six asset classes that we believe represents prudent and efficient investment. Accordingly we propose retaining our original forecast for this portion of our repex program in our revised proposal.

4.4 "Unmodelled" Repex

The AER considered the remainder of our repex forecast in two categories:

- SCADA, network control and protection (SCADA); and
- other assets.

The AER rejected our forecast of $108million for SCADA and substituted an amount of $25million. The AER accepted our forecast of $117million for the replacement of Other assets.

4.4.1 SCADA, Network Control and Protection

The AER have included SCADA, protection, communications and pilot cables in their assessment of SCADA repex.

The most material increase in this area arises from the initiation of a replacement program for pilot cables. The AER did not accept this step change based on the following finding from EMCa:

> *"In the absence of more substantial justification than that provided in the documentation available to us (i.e., the SARP description), we are not convinced that such a step change in expenditure has been adequately justified.*
>
> *For pilot cables, we would expect to see a full business case to support an investment step change of this magnitude.[16]"*

[14] EMCa Technical Review of Regulatory Proposals: Review of Proposed Replacement Capex in Endeavour Energy's Regulatory Proposal 2014-19, October 2014, pg ii
[15] AER Draft Decision Endeavour Energy distribution determination 2015-16 to 2018-19, Attachment 6: Capital Expenditure, November 2014, pg 63
[16] EMCa Technical Review of Regulatory Proposals: Review of Proposed Replacement Capex in Endeavour Energy's Regulatory Proposal 2014-19, October 2014, pg 26

This information was not requested by EMCa or the AER, however it is readily available and included as Attachment 5.06 to this revised proposal. Our analysis and business cases clearly demonstrate the need for this program and its legitimacy.

To summarise the information contained in this attachment, several of our pilot cables have already failed leading to compromised protection resulting in increased outages, fires, damage to equipment and costly repair. As an example, on 6 August 2014 a feeder burnt down due to slower temporary protection installed as a result of the failed pilot cable. This incident resulted in a loss of a 33kV feeder, loss of an 11kV feeder, and lines down in multiple locations including a line across the Western railway line causing a five hour closure of the railway line disrupting 220 train services and starting two grass fires.

At this level of granularity in asset classes there will always be step changes in expenditure when a new expenditure program is commenced. In this case, Endeavour recognised that the condition of the pilot cables as an asset group had deteriorated to a level where they posed an unacceptable risk to the safe and reliable operation of the network, as evidenced by failures such as described above, and initiated a replacement program in accordance with the attached business case. The step change in expenditure in this case is particularly pronounced because, while functionally related, pilot cables are a fundamentally different asset to SCADA and protection equipment with a significantly higher replacement cost.

Increases in the SCADA category also arise from the replacement of aged remote terminal units (RTUs). There are a significant number of RTUs that were installed in the early 2000s for which replacement parts have not been available since 2007 when the supply was discontinued by the vendor. These devices are experiencing high failure rates (72% of RTUs greater than ten years old have had a failure of some component in the last five years) and Endeavour Energy will run out of spare parts for these devices in 2015 at the current rate. These assets also rely on integrated batteries to retain their information, batteries which are now beyond their life. These RTUs are critical not only to the monitoring and control of the network, but also directly control the load control which provides hot water to customers, medical emergency functionality for Endeavour staff, voltage regulation which maintains voltage within the prescribed limits and reclose and change-over schemes which maintain reliability. The business case that supports these replacements is included as Attachment 5.06 to this revised proposal.

The third driver of increased expenditure in this area is associated with the replacement of protection relays. Two key network risks have been identified that this expenditure is intended to mitigate:

- In 1999/2000 the industry started to move to modern microprocessor protection relays. These devices have a 10-15 year life and are now reaching the end of their useful life. We have proposed to start replacing these in 2016/17 at an age of 17 years - 70% after their design life. We do not consider this to represent a conservative risk position, particularly given a common failure mode of these electronic devices is to cease operation resulting in unprotected assets rather than the older electromechanical devices in which this failure mode is very rare.

- Secondly, there is a need to upgrade the older protection relays on Endeavour Energy's distribution feeders, primarily to reduce arc flash for the safety of the public and Endeavour staff. A quantitative safety risk cost benefit analysis based on international best practice indicates that this risk control would have to cost greater than $122M NPV to be considered grossly disproportionate. These legacy relays are also non-redundant, which is not consistent with current industry standard. This asset need is detailed in Attachment 5.06 to this revised proposal.

In summary, we disagree with the AER's assessment that the step change in expenditure noted in this area is not well justified and provide evidence of the prudency of this investment. We have however reviewed our program in light of the latest information we have on network need and asset condition. As a result of this review we have determined that $20million of the expenditure originally proposed for SCADA replacement is no longer required. We have therefore included an amount of $61.5million for SCADA repex in our revised proposal, which we consider represents a well justified and sustainable level of investment.

4.4.2 Other unmodelled expenditure

The AER assessed the $117million of repex for Other assets in our substantive proposal as justified, based on the significant reduction from last regulatory period. In developing the forecast for this part of our

repex program we made a careful assessment of the most efficient way of addressing replacement needs for these assets. Our forecast is the result of this assessment and consequently we accept the AER's assessment.

4.5 Balancing Item

Endeavour Energy included a balancing item in the capital expenditure table in our RIN. This item was necessary as not all elements of our capex proposal fitted the definitions of the categories of expenditure provided by the AER. The AER were unable to determine the composition of the balancing item and made an arbitrary spread of this item across the assessed categories of expenditure. We do not consider this to have been an appropriate treatment of this item as it 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, two elements of the balancing item are most appropriately considered as repex.

4.5.1 Spares purchase

This is expenditure on maintaining a stock of essential spares items that are critical to the operation of the network and are not readily available in the event of a failure. This should be considered as repex as expenditure is required to replace items from the essential spares stock after an equipment failure. Our proposal included an amount of $7.3million for the period and is based on historic rates of expenditure, which we believe to be still appropriate.

4.5.2 Double counted expenditure

This element of the balancing item is a credit representing areas where expenditure was inadvertently included in repex and another area of expenditure. Two situations have been identified:

- Expenditure of $30.1million double counted as repex and included in unmodelled expenditure, associated with the provision of the alternate control service public lighting.

- Expenditure of $12million double counted as both repex and augex, arising from situations when, for the purpose of delivery efficiency, the scope of a major replacement project included identified augmentation works on the associated network. Major replacement projects were included in the group of expenditure items, excluding SCADA and network control, that was not modelled by the AER.

4.6 Revised repex program

We have considered the issues that the AER has raised in its assessment of our repex forecast and have reviewed our program in this light. The following summarises our revised proposal.

Asset grouping	Endeavour original proposal	AER position	Endeavour revised proposal
Modelled expenditure	$515M	$519M	$515M
SCADA expenditure	$108M	$25M	$61.5M
Other unmodelled expenditure	$117M	$117M	$72.4M
Total repex	**$740M**	**$661M**	**$648.9M**
Balancing item elements			
Essential spares purchase	$7.3M		$7.3M
Double counted expenditure	-$44.6M		
Total repex including balancing item	**$702.7M**		**$656.2M**

This represents a 6.6% reduction in the direct costs of the program and is a reflection of the solid basis of engineering risk assessment that we believe underpins our asset replacement program.

The AER should note that at this level of expenditure reduction Endeavour does not consider that an increase in maintenance opex will be necessary however further cuts in repex beyond this level will result in a need for increased routine maintenance as well as an increase in asset failures resulting in a need for increased expenditure on fault and emergency response.

4.7 Consequences of AER decision

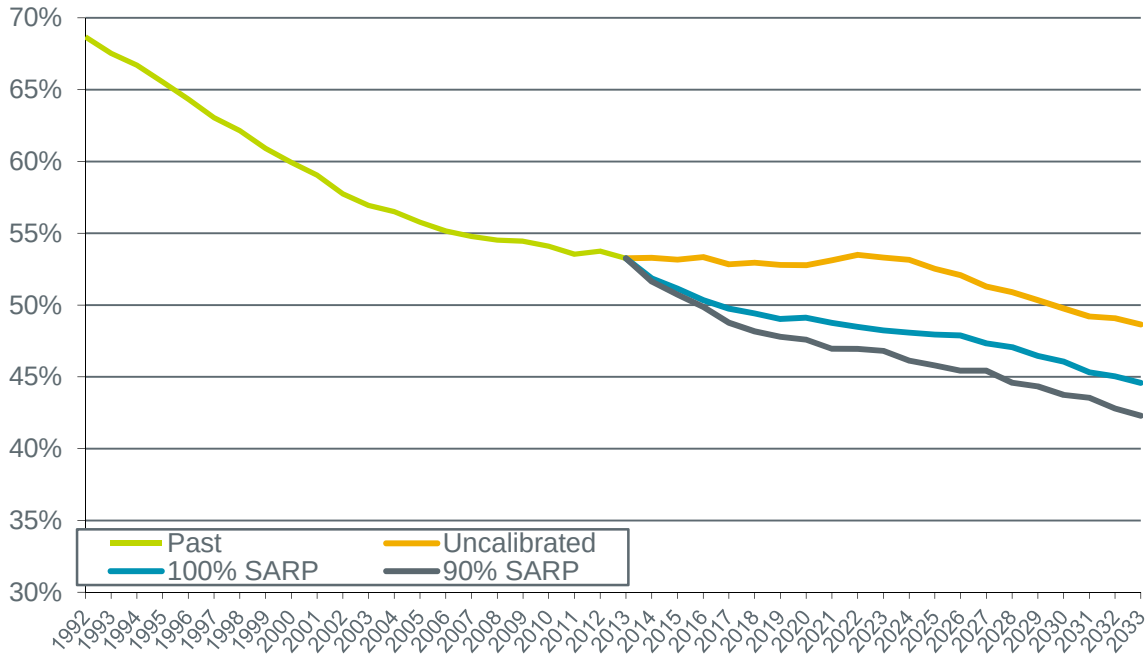
We consider our revised program represents a sustainable and efficient program that best serves the long term interests of customers. We have sought to avoid the need for future investment (and therefore price)

spikes whilst maintaining the safety and reliability of our network. A further reduction to this program will not enable us to meet our obligations or represent a sustainable level of expenditure.

While it is difficult to predict with accuracy the specific impacts of a reduction in repex the Weighted Average Remaining Life (WARL) of the asset base, which takes into account both age and condition factors, provides a useful proxy for expected network safety and reliabiliity outcomes.

The graph below indicates both the outcome expected from the investment level in our proposal (100% SRP) as well as the level that Endeavour had previously been targeting (uncalibrated) before the review of our overall risk position that led to our Board making a 20% reduction in our capex. The third line shows the impact of the AER's 10% cut ro our repex, which clearly shows that the AER's reductions will result in a reduction in WARL below the level that Endeavour considers to be sustainable in the long term.

At a high level this indicates that significant catch-up expenditure will once again be required. The short term price reductions will be at the cost of network health as assets age and deteriorate. We expect this declining WARL to be associated with increased maintenance expenditure and likelihood of asset failure and a decline in network performance.



5.0 Detailed response to EMCa report

Item	EMCa Reference	Quote	Endeavour response
1	Ii	We have identified systemic issues in Endeavour's activity forecasts that, in our view, have led to its repex need being significantly overstated. Its repex forecast is likely to have overestimation bias	We consider that a technical review would develop a robust view as to the prudency of our repex forecast by reference to specific projects and programs. Instead, the report relies heavily on trend analysis of the RIN data to assume the forecast is "likely to" have overestimation bias. We do not consider this to be the case and expect that it would be appropriate for the AER to rely on a more evidenced based conclusion. Furthermore, without rigorous or objective analysis we fail to see how the program is "significantly overstated". If EMCa only suspects the forecast is overstated then how can such strong views be formed. No explanation is provided of what process failures constitute a mild, moderate or significant overstatement.
2	Ii	Inadequate explanation of the degree of step-change evident in expenditure proposed at the sub-category level	It seems EMCa (or the AER in its scope) have relied on an opex based assessment approach in their assessment of our repex program. Capex is not assessed against the "base-step-trend" model as it is not recurrent and fluctuates between periods. It is more analogous to historic Augex and its cycles linked to past externalities such as economic conditions, Government Policies, technology uptake, etc. The lack of a historic smoothed Augex investment pattern results in the logical lack of a smoothed demised of investment that was undertaken. The Expenditure Forecast Assessment Guideline outlines that repex will be assessed by examining[17]:

[17] AER Better Regulation, Expenditure Forecast Assessment Guideline for Electricity Distribution, November 2013, pg 26

Item	EMCa Reference	Quote	Endeavour response
			• Our proposal content and attachments; • Historical benchmarks or benchmarks against other DNSPs; • Repex modelling; and • Detailed project review. The report almost exclusively focuses on historical trend analysis, which we consider insufficient. In our view, a technical consultant is best placed to focus on a detailed project review The purpose of our planning documents and business cases is to justify the forward need of the expenditure and not to explain expenditure "steps". Historical expenditure is only relevant to this extent and these comparisons should not form the basis or starting point of any assessment. We consider these variations in programs between periods are expected. To suggest that any change between periods must be justified by a "significant and sudden change in the risk profile" is unreasonable. We have limited capital available to invest in the network and must prioritise programs. The 2009-14 period focused on achieving licence conditions compliance and addressing network capacity constraints. As substantive progress has been made in these areas we may now seek to address other risk areas. These programs risk profile have not changed except to the extent the risks are now closer to being realised. This trend analysis suggests that capex investment should be sustained and consistent over time. This would involve the proactive replacement of assets or the use of high level tools such as the VDA and WARL to manage network age. This is

Item	EMCa Reference	Quote	Endeavour response
			contradictory to the emphasis EMCa places on detailed condition based assessment. We are supportive of sustainable capex profiles, hence our development of the VDA, which was a precursor of the AER's own repex model. However, we are not supportive of programs being pegged to insufficient allowances from a previous period when other investment required prioritisation to meet our obligations. We consider the proposed program represents a sufficient and sustainable level and should be assessed on its merit rather than its variance from 2009-14 expenditure.
3	ii	We understand that the NNSW Board decided to reduce Endeavour's overall capital expenditure proposal by 15%... However, such adjustments need to be adequately informed if they are to ensure that the resulting work program is prudent.	The Board was adequately informed and we would like to understand what examples and evidence is available to suggest that the Board has not correctly discharged its responsibilities. The Board was in fact provided with a detailed prioritised list of all proposed capital investment, allowing an understanding of the risks involved in adjusting the total volume of capital investment. We would also like to understand how any substitute allowance from the AER would satisfy this requirement. In particular, we would like to understand whether EMCa has reviewed the AER's substitute allowance in a similar manner or if any other review has been conducted given a technical advisor has not developed the substitute.
4	ii	Endeavour believes that the remaining 85% capex allowance is sufficient to meet its objectives and maintain risk at an appropriate level. This position appears to be primarily based on its weighted average remaining life calculation. Endeavour also uses its Value Development	Endeavour believes the remaining capex proposed is sufficient to meet its objectives and maintain risk because of the detailed plans and business cases that support our program. The WARL, an output of the VDA, is a useful cross-check of the sustainability of the expenditure level. The

Item	EMCa Reference	Quote	Endeavour response
		Algorithm (VDA) to cross-check its expenditure level.	WARL is not used to set the expenditure level as incorrectly suggested by EMCa. Additionally, we note that on key issues such as this the position is a supposition ("appears to be") rather than a verity. Given the importance of this assessment and the AER's reliance on it we consider it prudent to rely on evidence based conclusions. Setting the above aside, we note that the expiration times of assets years in advance of the present is always speculative and therefore modelling of the foreseeable probable outcomes on a mass population basis is statistically appropriate with the precise assets being identified and replaced when the technical evidence at that time supports the action for the specific assets.
5	iii	Endeavour maintain that further reductions in expenditure would lead to an unacceptable increase in asset risk (using a lower than acceptable WARL as a proxy for asset condition). However, this assumes that WARL is a suitable proxy for both asset condition and asset risk	This does not assume WARL is a proxy for both asset condition and risk (although it would be reasonable to do so). It is simply a statement of fact that assets have a finite life and therefore require replacement at some point in the future. To ignore the ageing of an asset base generally means that risk will also increase. It also provides an objective indication of the investment implications of deferring expenditure. An investment boom is a question of "when" not "if" if assets are not managed at this strategic level. As per our substantive regulatory proposal: *By proactively focusing on managing the average age of network assets, this strategy also seeks to achieve a more consistent and sustainable level of expenditure in the long term, rather than create a 'boom-bust' investment cycle. Our replacement program effectively balances the need to replace*

Item	EMCa Reference	Quote	Endeavour response
			assets before they fail with the requirement to ensure the costs of doing so are efficient.
6	iii	Endeavour tends to overstate asset failure risks (which in turn is used to support higher volumes of repex than is prudently required). Whilst we have found that Endeavour is generally directing its expenditure to the correct asset groups, treating a portion of these assets sooner than required is not in the best long term interests of customers.	No evidence or examples are provided to substantiate this claim. No explanation is provided to explain what represents "treating assets sooner than required" and instances where we are proposing to do this. If the inference is that assets should be regularly 'run to failure' we would like to understand how this would be in the interests of customers, safe or compliant with our obligations. We note that there is a continual competing balance between allowing assets to fail and suffer the consequences of the failure as opposed to tacking proactive action just prior to the failure and avoiding the failure consequences. By way of example, passengers on a jet airliner would rather the airline repair or replace aviation components for major wing supports or Engine turbine components, before the wing breaks off incurring significant community costs. Endeavour Energy's strategy is to replace the assets before they fail in the knowledge that many of the failure modes result in potential explosion, the creation of fire ignition sources or heavy objects falling to ground that could injure or kill an innocent member of the public. Endeavour Energy believes that run to failure has an application in our industry but only limited. We refer the AER to the West Australian Standing Committee on Public Administration, Report 14, Unassisted failure, January 2012 and its condemnation of Western Power

Item	EMCa Reference	Quote	Endeavour response
			concerning its practises on unassisted pole failures and failure to take more proactive measure to replace or otherwise remediate the likelihood of such failures. We also refer the AER to the deliberations, findings and recommendation of the, "2009 Victorian Bushfires Royal Commission" and its concerns and recommendation with respect to asset failures and the need to manage networks to avoid such failures and their potential catastrophic impacts and consequences upon the community. Endeavour Energy's repex strategy targets replacement pre failure rather than post for the reasons et out above and as such there is limited data on actual failure.
7	iii	At the project/program level, we found that Endeavour takes a conservative approach to applying risk assessment criteria. We also found that, at the portfolio level, decision support methods reflect a high level assessment.	No examples or evidence is provided to substantiate its claim at the program/project level. In fact, we note that in the report a specific program/project is referenced only on four occasions (see footnotes on page 14 of the report). Setting this aside, we wish to understand why a conservative approach would be considered inappropriate. Given the substantive risks and consequences of network failure it would be prudent to adopt a risk adverse approach.
8	iii	Aspects of Endeavour's implementation are susceptible to overestimation bias due to issues relating to the maturity, accuracy and reliability of asset condition data.	No evidence or examples are provided to substantiate this claim and identify which aspects are susceptible.
9	iii	Our conclusion is that Endeavour is following an asset management approach that correctly identifies where it should focus its repex, but that its application of the approach to the current Regulatory Proposal is biased towards overstating network risk…… … This casts doubt on the prudency of Endeavour's repex,	No evidence or examples are provided to substantiate this position. If Endeavour is targeting the correct areas we are unsure of how subjective criticisms of our processes could warrant "significant reductions". We would expect that if the AER are to specify a percentage cut it would be factual and evidence based.

Item	EMCa Reference	Quote	Endeavour response
		even after the NNSW Board-enforced reduction.	As a high level check we have also compared our repex analysis of needs to those produced through the AER's repex model and found the global correlation and synergy to be extremely high. We therefore refute on the basis of the AER's own models and tools that the risk position identified and managed to by Endeavour Energy with respect to repex to be targeted at an appropriate level of risk.
10	iv	Our review of Project Implementation Review reports indicates a systemic bias of actual repex being considerably less than forecast.	This conclusion appears to have been drawn based on a review of three post commissioning reviews. This is hardly a representative sample of the replacement projects undertaken by Endeavour. Furthermore, the estimate of the portfolio expenditure is not based on the sum of project estimates but on historic actual expenditure.
11	iv	Endeavour's estimating process allows for a contingency for risk to be applied at the final (Gate 3) approval stage to individual projects. We believe this is unnecessarily conservative in a portfolio forecast and recommend that the aggregate contingency amount in Endeavour's repex portfolio forecast should not be allowed.	Our individual project estimates include a contingency allowance to reflect the project specific risks that may impact on the financial outcomes of the project. These contingency amounts are not however included in the expenditure forecast for the entire portfolio, which is based on historic unit rates.
12	iv	Endeavour significantly over-estimated its replacement expenditure requirements in the prior RCP	As per the Annual RIN information (with 2009-10 account prepared on a consistent basis to the remainder of the period), this statement from EMCa is factually incorrect. The actual expenditure was $1.4million below the allowance, we do not consider a 0.16% underspend a "significant" over-estimation. Our 2009-14 allowance equated to $877.4million (nominal) for replacement expenditure. Our actual expenditure for the period on replacement was $876.0million (nominal). We question the credibility and usefulness of a report based on fundamental errors such as this. We wish to understand what factually accurate evidence is available to support the

Item	EMCa Reference	Quote	Endeavour response
			position that there is an overestimation bias in our forecasting process for replacement expenditure.
13	iv	In summary, there are significant flaws in Endeavour's repex proposal. We consider that its proposed repex allowance overstates the prudent and efficient amount that it will reasonably require.	As outlined above, we wish to understand what objective criteria we have been assessed against to establish "significant flaws" exist. The report does not provide sufficient evidence or examples to demonstrate this. Instead, it primarily relies on trend analysis and circumstantial evidence regarding our processes to support this conclusion. As this report is being relied upon to reject our proposed repex and substitute a significantly lower amount we consider more robust analysis is required and a specific view as to what the appropriate level of expenditure would be based on technical analysis.
14	1	The purpose of this report is to provide the AER with technical advice on the network replacement expenditure that Endeavour Energy (Endeavour) has proposed as part of its Regulatory Proposal (RP) for the 2015 – 2019 control period. The assessment contained in this report is intended to assist the AER in establishing an appropriate capital expenditure allowance as an input to its Draft Decision on Endeavour's revenue level.	As above, we fail to see how the report achieves either of these objectives as: • there is no technical discussion of programs and projects but rather primarily trend analysis; • a substitute amount is not provided, or a reasonable range for a substitute amount; and • an assessment of the AER's substitute amount from a technical perspective is not provided. We note that in the preface of the report the consultants state *"this report is not intended to be used to support business cases or business investment decisions nor is this report intended to be read as an interpretation of the application of NER or other legal instruments"* This indicates that the consultant has not undertaken a robust review of Endeavour Energy's repex investment requirement

Item	EMCa Reference	Quote	Endeavour response
			and that the report is not to be used for decision in respect to Endeavour Energy's future investment plans.
15	5	The RIN also shows a "balancing item" for which there is insufficient information to ascertain whether or to what extent this relates to repex.	A breakdown of the "balancing item" is provided in Endeavour Energy's RIN 'Basis of Preparation' attachment (as required by the RIN). We can confirm no items relate to replacement, as they would have been included with replacement. If the Basis of Preparation or RIN has not been reviewed by EMCa (which appears to be the case) then we fail to see how EMCa could understand the repex information provided in the RIN. The RIN information has been heavily relied upon in their assessment without an understanding of how it was prepared.
16	5-6	Overall, there is a 5% reduction in forecast repex compared to the prior RCP. The following features of this data are evident: • At $137m, replacement of overhead conductors is the largest proposed program - this represents a 30% expenditure increase compared to the prior RCP; • Endeavour's proposed SCADA expenditure of $108m is the second largest program - this represents a 122% increase on expenditure compared to the prior RCP; • Endeavour's proposed zone and sub-transmission substation renewal / replacement is also large, at $99m; however, this represents a 70% decrease on expenditure compared to the prior RCP; • Other proposed programs over $50m that show increases relative to the prior RCP include pole and pole top structures ($82m), underground cables ($76m) and switchgear ($57m). Endeavour also proposes spending $69m on transformers, which is	Refer to the response for item 2. Setting aside the issues with relying on trend analysis in assessing capex we note the overall program represents a 5% reduction compared to the prior period according to EMCa's analysis of the RIN data. With respect to Overhead mains we refer the AER to the findings and recommendations of the 2009 Victorian Bushfires Royal Commission, specifically with respect to programs Endeavour Energy has proposed. Upon review of the Commission's recommendations Endeavour Energy became aware that the Industry and Endeavour Energy's risk position with respect to overhead mains failure was too high and in excess of community expectations and potential Community impact and cost. Accordingly through the course of the last determination period Endeavour Energy commenced addressing this situation and hance the ramp up in expense through the period to level now proposed in the substantive regulatory proposal.

Item	EMCa Reference	Quote	Endeavour response
		slightly less than in the prior RCP.	The increase in SCADA expenditure is the result of the initiation of a program of pilot cable replacements. While functionally related to SCADA equipment, pilot cables are fundamentally different to other assets in this category, with a significantly higher replacement cost. This program is well justified by asset condition and failure rates. In the area of zone and sub-transmission expenditure, significant expenditure was undertaken on augex in the RCP and the synergy of combining augex and repex opportunities undertaken. Both from an augex and repex perspective the synergy blend has changed substantively between the two period due to the step reduction in augex requirements meaning that comparisons cannot be made without detailed analysis of the previous expenditures to try and disaggregate the synergy components. With respect to service wire replacement expenditure the program was in its infancy through the RCP period as commercial and technical development was undertaken. Our proposal represents the requirements of the tested and mature process going forward.
17	7	However, if the ratio of direct to indirect costs was similar to the current ratio, and if we assume that this is the only material difference between the RIN and RP data for the prior period	Refer to response for item 15
18	8	In its preliminary assessment, the AER noted that Endeavour over-forecast capex in the prior RCP and questioned whether this may imply bias or over-forecasting for the 2015-19 RCP.	Refer to response for item 12. Furthermore, we note that the AER approved the 2009-14 allowance: *"The AER's analysis confirms the need for, and efficiency of, an increased investment allowance, cognisant that this*

Item	EMCa Reference	Quote	Endeavour response
			increased investment will result in higher user charges."[18] The allowance was deemed efficient by the AER. Subsequent to this and without consulting the NSW DNSPs the AER revised this view, with the Chairman at the time (Andrew Reeves) stating the following: *"NSW and Queensland are getting more infrastructure than we think they need and we are required to approve price increased to pay for it."*[19] It is inappropriate to revise this position in an ex-ante regulatory framework. This view has been formed prior to our 2014-19 determination process without explanation. We consider this preconceived view has prejudiced the 2014-19 determination process and this advice from the AER to EMCa is an example of this.
19	8	The AER also noted that Endeavour appeared to have conflated asset condition with asset age, stating that the "...*WARL… measures the remaining life of the network assets, taking into account both age and condition issues*".	Refer to response for item 5. Specifically to the AER's point that we conflated age and condition we note this clear statement in our regulatory proposal: *Average age modelling provides a useful high level check on the detailed condition-based assessment we undertake to develop our forecast.* The EMCa statement is based on an incorrect understanding by the AER of the way in which the VDA model works. WARL is an output of the VDA model, which has as inputs both

[18] AER News Release, NR 005/09, 'AER final decision approves increased investment in the NSW electricity distribution network', 30 April 2009
[19] Sydney Morning Herald, 'Pricing rules boost power of electricity suppliers, 21 June 2011, pg 6

Item	EMCa Reference	Quote	Endeavour response
			asset age and a condition assessment.
20	9	the AER noted that Endeavour's projected risk profiles tended to reduce considerably and to go flat over the period 2019/20 to 2023/24 and queried whether this implies that expenditure might have been inefficiently brought forward into the 2015-19 RCP.	It is assumed that this relates to the forecast WARL profile. The reduction in WARL noted represents an increase in asset life (lower remaining life). This is therefore an increasing risk profile. It is not clear how this may imply that expenditure has been inefficiently brought forward. A WARL that is neither increasing nor decreasing represents a long term sustainable position for the business. Since 2002 we have been implementing a strategic approach to asset renewal that has an objective of stabilising the WARL at a level that represents an appropriate level of risk. The plateau noted is an outcome of the application of this strategy over a period in excess of ten years. It is further noted though that our proposal showed two WARL profiles, with the second, which relates to our proposal, not flattening out but showing a continuing decline in remaining asset life due to the 20% reduction in expenditure included in our program.
21	10	In some asset categories, Endeavour has inadequate data quality to make an optimal assessment of particular asset strategies and to justify the volume and timing of activity.	Endeavour would like to understand which asset categories as these are not identified nor is evidence and examples provided to support this view. Without specifying this Endeavour has not been provided a reasonable opportunity to respond to the issue raised. The significance of the data quality input needs to be assessed as well, Whilst we would agree we don't have 100% perfect data we doubt any entity does. We consider our data accuracy is adequate to make an assessment with appropriate allowances for sensitivity variation.
22	10	Endeavour uses an industry standard risk management	As above, for the AER to rely on this advice we would

Item	EMCa Reference	Quote	Endeavour response
		framework for assessing bottom-up risk, but applies the risk assessment criteria conservatively by overstating the likelihood (or frequency of occurrence) of the worst case event.	consider it a prudent and credible for specific examples with an explanation be provided to support this subjective assessment.
23	10	The 15% capex reduction imposed by the NNSW board to Endeavour's originally proposed portfolio is evidence of a conservative bottom-up and top-down risk assessment by Endeavour. It is our view that the Board's high-level reduction may be inadequately informed to ensure that Endeavour's repex program is prudent.	In Endeavour's view this position represents an error in logic. If EMCa have formed the view that the Board reduction indicates a conservative forecast from Endeavour then how can EMCa also be of the view that the Board were inadequately informed to ensure the program is prudent? If the Board and therefore EMCa (in their view) are uninformed then it cannot be concluded with confidence that the original Endeavour forecast was conservative, appropriate or insufficient.
24	11	It may be the case, for example, that forecasting expenditure levels to "contain average network tariff increases to CPI" results in an excessive network expenditure forecast and that a prudent and efficient expenditure forecast would allow network tariffs to be reduced.	Equally, it may also be the case that the pricing constraint may result in an insufficient network expenditure forecast that a prudent and efficient DNSP requires. In a technical report such as this, views should be formed on the basis of fact rather than the accumulation of speculative arguments. Irrespective of this, the process was really one of a stated objective and test for sustainability. CPI was the stated desired target and the engineering modelling was able to support this outcome. If the modelling had not then the target would not have been able to be supported.

Item	EMCa Reference	Quote	Endeavour response
25	13	The -15% capex portfolio adjustment imposed by the NNSW Board indicates that whatever 'challenge' process was used by Endeavour was inadequate, either in terms of the prudency of the repex work proposed (volume and timing) or the cost of the work….. ….The extent of the Board's reduction indicates that any information it did receive was not compelling. Moreover, it is not clear what proportion (if any) of the overall capex reduction was applied to the initially-proposed repex.	As part of any technical review we would consider it prudent to understand *"whatever 'challenge' process"* we have used prior to forming a view on our proposed capex and the associated processes. Information was provided to EMCa regarding our governance and forecasting process. In the absence of this investigation from EMCa we consider the view that our challenge process was "inadequate" is an assumption rather than an evidenced based, reasoned conclusion. In regards to the latter paragraph, this view represents an assumption. It may be equally valid to suggest that the Board were simply prepared to accept the increased risk. Further, if EMCa do not understand what proportion of the reduction was applied to repex, then it is not appropriate to assume the reduction reflects negatively on the repex forecasting process. This should have been investigated and understood prior to forming such a view.
26	13	There is insufficient evidence of the analysis and information which is typically generated by a quality asset management system.	Endeavour considers that it does have a quality asset management system and that our decisions are based on sound information and engineering expertise. EMCa do not substantiate this position by explaining what it considers a quality information system to be. We do not understand this assessment when no clear criterion is provided which demonstrates where our evidence proved insufficient.
27	13-14	Whilst it contains the basic elements, we believe its apparent lack of review gates during the project development lifecycle is likely to lead to sub-optimal project plans.	We reject the assertion that our governance process is basic based on the evidence we provided to EMCa and the AER. At a higher level, we do not understand how our 3 gate process equates to an "*apparent lack of review gates during the project development lifecycle."*

Item	EMCa Reference	Quote	Endeavour response
			An alternate view is not provided as to how many additional gates would satisfy this high level assessment or what amendments would be required to address this concern. Overall, it is also not clear that EMCa understood the degree of analysis and review that takes place over the project development life cycle as much of this information was not reviewed during the assessment process.
28	14	Whilst the NNSW governance process is likely to have resulted in improving the quality of Endeavour's project justification over time, the full effect does not yet appear to have been fully incorporated into Endeavour's proposed repex program for 2014-19.	We do not understand how this view is cognisant of the 20% Board reduction. An alternate position is not provided by EMCa as to what reduction is required to fully incorporate the improvements in our governance process. We fail to see how improvements to a governance process could deliver reductions in excess of 20%. We fail to see how this reduction could be as inadequate with no consideration of what would be adequate.
29	16	In our experience, age-driven strategies can result in an over-estimation of overall asset replacement activity and sub-optimal risk reduction	No evidence or examples are provided to substantiate EMCa's experiences which prove that age-driven strategies can result in over-estimation. This is a supposition underpinning an argument rather than fact. Endeavour Energy does not use an age-driven approach to determining specific areas for expenditure. We use age as a proxy for asset condition, modified by a high level understanding of asset condition, to determine long term expenditure needs however specific investment proposals are determined on the basis of asset condition. Statements such as this make it apparent that EMCa have not understood our approach to asset renewal and put in question many of their conclusions.

Item	EMCa Reference	Quote	Endeavour response
30	17	Endeavour's approach to risk assessment appears to be based on limited fault information and lack of detailed analysis.	Evidence supporting this view is not provided. We believe that system performance data supports the decisions to have been prudent historically.
31	17	We would expect that for investment programs of the magnitude proposed, Endeavour would evaluate a range of options, sensitivities and risks with regard to: • Life extension strategies; • Hybrids of replacement and life extension strategies; and • Alternative volumes of work (i.e., deferral or advancement)	Alternate solutions are considered during the final program development. However we already have a range of alternatives that have historically been factored into estimates. For example, pole nailing, pole replacement. Evidence of this is provided in the business cases that have previously been provided to the AER and its consultants and the further asset renewal business cases that are attached to our revised proposal.
32	17	In the information available, it was not always clear how Endeavour derived the prescribed volume of work to be undertaken. In the project justifications provided in the SARP (and in the few Business Cases provided following our request for such information), there are statements that indicate volumes were decided on the basis of engineering judgement supported by the high level VDA/WARL indicators. We contend that this is inadequate for multi-million dollar program expenditures.	No specific statements, examples or evidence is provided to support this view that our planning function is systematically flawed and inadequate. The appendix provides a more detailed explanation of our approach to asset renewal planning and discusses how our program is developed from both a high level strategic view of asset renewal needs and a detailed bottom-up asset condition-driven view. We contend that the high-level analysis and assumptions in this report are inadequate to rely on to dismiss our repex forecast and reduce it by 10%
33	18	We have observed in the information provided, that Endeavour typically applies contingency amounts of between 5-10% to its base estimates.	Our individual project estimates include a contingency allowance to reflect the project specific risks that may impact on the financial outcomes of the project. These contingency amounts are not however included in the expenditure forecast for the entire portfolio, which is based on historic unit rates.
34	18	We have been unable to confirm the extent of repex underspend in the prior RCP (2009-14) on a comparable basis, from the information provided by Endeavour. However, it did underspend its AER capex allowance by $345m (12%) overall, with most of the under-spend in the	Refer to the response to item 12. We do not understand the relevance of the overall program expenditure to the repex program and the repex program was only 0.16% below the regulatory allowance.

Item	EMCa Reference	Quote	Endeavour response
		first two years.	In addition to this, we consider the repex underspend assessment is in error. The report fails to account for the stated synergy adoption for augex projects to have been leveraged to also undertake repex at the same time.
35	19	From the PIRs provided, which are for major substation renewal projects, the average underspend was 28%, not including contingency provisions. Although this is based on a small sample, it is indicative of poor estimating performance.	As per item 12 and item 34 above the postulation is clearly incorrect considering our estimation was only 0.16% out for the repex program. Endeavour Energy does not see how a conclusion regarding an entire program can be reached from such a small and non-representative sample. The completion of PIRs represents good asset management practice and permits the feedback of lessons learned into the estimating process. By definition, any learning organisation will at any point have projects completed using newer, more efficient delivery models whose original estimates do reflect such delivery models.
36	19	However, based on our interpretation of NNSW's and therefore Endeavour's capital approval process, it is not until approval Gate 3 that works must be estimated with accuracy of ± 10% and, based on the information provided, with contingency amounts still included. This provides leeway for Project Managers to achieve budget targets without driving hard for internal and external efficiencies	This point confuses individual project estimates, where it is appropriate to include contingency to cover individual project delivery risks, with the portfolio estimate where contingencies are not included. We do note that volume discounts are already factored in as volume based estimating from the current inputs where appropriate. It should however be noted that a project cost is never known with 100% accuracy until the project is complete. It is therefore appropriate to include contingency even at Gate 3. This is the reality of an ex-ante regulatory framework that we must manage as a prudent business.

Item	EMCa Reference	Quote	Endeavour response
37	19	We noted in discussions with Endeavour that increasing volumes of units to be replaced should allow some discounts to be realised. Endeavour considered that this would not be the case.	Endeavour's attendees do not recall this discussion or exchange. If agreed minutes cannot be produced to verify this statement we consider it an error of fact and misleading. Irrespective of this, we wish to understand where these discounts can be sourced. The view presented is speculative and cannot be responded to by Endeavour without further detail or clarification.
38	22	We acknowledge that Endeavour undertook a condition assessment scoping study of its population of steel conductor during 2013/14 to inform its Board of a reasonable program and corresponding risk, as outlined in its business case, but it would appear that the results of this study, if complete, have not been taken into account in the regulatory proposal.	As discussed in the business case that was provided, the scoping study indicated that a significant percentage of our steel mains were considered to be high risk. The forecast expenditure to replace these is included in our regulatory proposal. As indicated above, subsequent work to understand the risks posed by these conductors has highlighted that some of this expenditure may be deferred however at the time that the AER discussed this it was still under consideration.
39	22	In our view, the SARP did not adequately explain the RIN data in its entirety.	The SARP bears no relationship with the RIN data whatsoever. The SARP is a BAU planning document which supports the forecast proposed in our regulatory proposal when it coincides with a regulatory determination process. It is updated on an annual basis. The RIN is a requirement from the AER that accompanies our regulatory proposal. The data is prepared in accordance with the instructions and definitions provided by the AER and reconciles with the proposed capex in the regulatory proposal. It does not represent how we record our information or forecast our expenditure. The RIN data is explained in the Basis of Preparation as required by the RIN. The SARP is not required to address

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			any matters relating to the RIN. As per our response to item 15 it appears EMCa have not reviewed this document which may explain their questions surrounding the RIN data.
40	22	We have been unable to find a compelling explanation of this profile. We have seen limited failure rate information, asset condition data and options analysis in support of the increasing existing and forecast expenditure	Endeavour is proposing a forward expenditure program not seeking to justify step changes between regulatory periods. Refer to response to item 2 for further detail. Also, see earlier comments on the objective of taking action before actual failure and exposing of Public Officers to legitimate prosecution for public safety negligence.
41	23	The increase indicates a significant and sudden change in the risk profile of these conductors, which is not explained in the SARP. The increase also assumes all previous deliverability issues are resolved prior to the commencement of the 2015-19 RCP.	As above refer to item 2 for response to this issue. In regards to the deliverability issues refer to item 12 response.
42	23	Whilst we accept the need for ongoing conductor replacement during the 2015-19 RCP, we remain unconvinced that the level and profile of the expenditure proposed in the RIN is justified and achievable. In addition, such a step change increase in the volume of work would be expected to give rise to deliverability constraints, particularly for this labour intensive work program.	No evidence or explanation is provided as to why the level and profile is not justifiable or achievable. Given our proposed capex represents a 35% real reduction compared to 2009-14 actual expenditure we consider we are more than capable of delivering the 2014-19 program. Moreover, during the 2009 to 2014 period Endeavour developed and implemented efficient market based delivery processes to respond to volume needs for conductor replacement and other capital construction activities. These delivery processes, which utilise market testing contracts, remain in place. If EMCa disagrees with this position we would expect this to be based on robust analysis and review of our SAMP Strategic Delivery Plan which was also attached to our regulatory proposal.

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43	24	The SARP does not set out a longer-term (say fifteen year) strategy to replace CONSAC cables and we would have expected to see this.	No evidence or explanation is provided as to why fifteen years is an appropriate planning horizon. As evidenced by our WARL and VDA models we do consider long term sustainability when planning network investment. We consider EMCa's report contradictory in the sense that it relies on trend analysis and suggests a longer-term planning horizon in this instance whilst assessing a 5 year proposal with the main criticism being an over-reliance on high level tools rather than detailed technical analysis.
44	26	In the absence of more substantial justification than that provided in the documentation available to us (i.e., the SARP description), we are not convinced that such a step change in expenditure has been adequately justified. For pilot cables, we would expect to see a full business case to support an investment step change of this magnitude.	See item 2 for our position on EMCa's use of trend analysis. However, it should also be noted that the only material change in the SCADA program is the pilot cable program. Endeavour does have a business case supporting this investment which provides additional detail to the SARP. If this had been requested by EMCa or the AER it would be provided. It is attached to our revised regulatory proposal for reference; we consider this would resolve the misconception in this report that it is not supported by a business case. It should be also noted that future network modelling suggests that the nature of our service delivery will be significantly different to the present. Therefore 15 year modelling based on current business models is considered inappropriate and inefficient due to the high likelihood of redundant outcomes.
45	27	The SARP does not adequately describe the change in expenditure. The information in the SARP for service wire does not support the increase in expenditure or the rationale for	See response to item 2. Justifying this change is not the purpose of the SARP nor do we consider it the primary consideration of a prudent operator when developing capital (rather than operating) plans.

Item	EMCa Reference	Quote	Endeavour response
		moving from a reactive to a planned program of this magnitude.	See response to item 16 on the rationale for service wire change.
46	28	The aggregated expenditure for the 2015-19 RCP has significantly increased from the expenditure in the prior RCP. The 2014-19 profile presents a marked step up from the historical average. This appears to be the case for all asset classes and types.	See response above and for item 2. It is further noted that the focus of Endeavour's capital investment program during the 2009-14 RCP was on augmentation of the network to attain compliance with the NSW DRP Licence Conditions. This resulted in a lower than ideal investment in asset renewal. The expenditure profile for 2014-19 in many ways represents an attempt to "catch up" with previous under investment to avoid the risk associated with aged assets becoming unacceptable.
47	29	Notwithstanding the safety and operational benefits of installing an enclosed switch, our review has found insufficient justification (including a robust cost/benefit analysis) for neither the volume of replacement work proposed nor for the selection of higher cost replacement options.	We do not accept the qualification, "notwithstanding safety and operational benefits", these form the base rationale. Endeavour does not understand how this conclusion is reasoned or justifiable "notwithstanding" the safety and operational benefits. These two factors are critical to understanding the merit (or demerit) of the proposed program and cannot be set aside in any assessment. Our proposal is backed by detailed FMECA analysis and is intended to remove specific types of switch from the network based on analysis of past failures. This program was not specifically discussed during EMCa's review otherwise we would have supplied this information at the time.
48	30	Appendix A Project Scope	Endeavour wishes to understand if the AER or EMCa has performed any analysis to forecast the costs involved in satisfying all of the dot points from a planning perspective. Also, whether any benchmarking has been conducted to understand if any DNSP addresses all of these points and questions in their planning process.

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			We do not consider it an efficient or prudent use of the limited resources we have available to address all of these matters. It is also not possible without access to perfect information systems and data regarding the network. We consider that our systems are adequate and comparable to most DNSPs in Australia. If we were able to conduct such detailed and granular assessment it may result in identifying increased expenditure needs. In our view, the questions are based on the assumption that expenditure could be reduced if a DNSP cannot satisfy the scope.