Annual Reporting Regulatory Information Notice

BASIS OF PREPARATION
SUBMITTED: 31 OCTOBER 2018

Endeavour Energy

Contents

Purpose

The Annual Reporting Regulatory Information Notice (RIN) requires Endeavour Energy to prepare a Basis of Preparation for all historic information in the Regulatory Templates which are the worksheets contained within the Microsoft Excel workbooks at Appendix A of the RIN. By this, the AER mean that for every historic variable in the Templates, Endeavour Energy must explain the basis upon which we prepared information to populate the input cells. The Basis of Preparation must be a separate document (or documents) that Endeavour Energy submits with its completed Templates. The AER will publish Endeavour Energy's Basis of Preparation along with the Templates.

This document is Endeavour Energy's Basis of Preparation in relation to the historic information contained within the Regulatory Templates required to be submitted to the AER by 31 October 2018.

AER's instructions
The AER requires the Basis of Preparation to follow a logical structure that enables auditors, assurance practitioners and the AER to clearly understand how Endeavour Energy has complied with the requirements of the RIN.

To do this, Endeavour Energy has structured its Basis of Preparation with a separate section to match each of the worksheets tabs where a Basis of Preparation is required.

The AER has set out what the minimum requirements for the Basis of Preparation are. This is detailed below:

1. Endeavour Energy must explain, for all information in the Information Templates, the basis upon which it prepared information. This is the Basis of Preparation;

2. The Basis of Preparation must be a separate document that Endeavour Energy submits with its completed Information Templates;

3. The Basis of Preparation must follow a logical structure that enables auditors, assurance practitioners and the AER to clearly understand how Endeavour Energy has complied with the requirements of this Notice; and

4. When carrying out an audit or review as specified in Appendix D, an auditor or assurance practitioner shall have reference to Endeavour Energy's Basis of Preparation.

Structure of this document
We outline our general approach to developing our response to the RIN. We identify key systems used to provide data, note issues relating to data quality, and make comments on the reliability of the data for economic benchmarking purposes.

General approach

In this section, we identify our general approach to collecting and preparing information.

Systems used to provide data
Where methodologies or assumptions were required to complete the files other than the mere application of the AER approved CAM to the general purpose financial statements Endeavour Energy has included commentary by way of the "note" function within Microsoft Excel to provide guidance to the AER.

Below is a listing of Endeavour Energy's systems that, to a greater or lesser extent, were directly related to or supported the development of the information contained in the RIN templates:

- Cognos – Business reporting system managing database information such as organisation policies and procedures;
- Ellipse – financial management system including: accounts payable; payroll; asset and equipment registers and financial reporting functions. The Ellipse system also caters for defect management (condition based) and also routine maintenance (planned). The equipment register is also linked to various other supporting systems such as field inspections and the Geographical Information System (GIS);
- TM1 – Endeavour Energy uses this OLAP tool for various purposes including budgeting and forecasting, monthly reporting and regulatory accounts allocations. It is a cube based technology which allows rules to be created between cubes and within cubes;
- eFrams – Endeavour Energy uses this system in relation to IT Allocation Drivers. The system enables access to all telecommunication billing, inventory management/asset register and reporting;
- Remedy - Endeavour Energy uses this system in relation to IT Allocation Drivers. This is a BMC tool used by CGI for asset management, definitive software library, incident management and service request management;
- Autocad - Endeavour Energy uses this system in relation to Property Drivers. This is a program used for computer-aided design and drafting. The program is used to maintain Floor Plans which can be used to summarise occupancy by business unit;
- Banner – Endeavour Energy's customer database and billing system;
- Figtree – Worker's compensation claims management data base. This system is maintained separate (but linked at aggregate levels) to other systems to maintain confidentiality of data as required by legislation;
- Value Development Algorithm (VDA) – Endeavour Energy uses the Value Development Algorithm (VDA) for its high level asset renewal expenditure modelling. The model is populated with specific asset data in order to produce the replacement capital forecast. Data for each asset is allocated into asset categories, which represent major components that make up the network such as poles, transformers, conductor, cable, switchgear etc. Each asset type is assigned an asset life and a replacement cost. The quantity of assets installed on the network each financial year is also entered, thus generating an age profile of the network assets;

- Visual Risk – Endeavour Energy uses this Treasury Management System for improving the productivity of its treasury operations. Visual Risk provides functions such as capturing a facility drawdown; valuing an FX option; and facilitating back office administration and financial reporting. Specifically it was used to prepare the cost of funds schedule;

- System Fault Recording (SFR) – Endeavour Energy used this Oracle database system for all reliability reporting up until 2011-12. The data in this system is accessed using Cognos, with further analysis and processing of data being undertaken using Microsoft Office programs such as Access and Excel;

- SCADA - Endeavour Energy uses this system to monitor and control its network. Information from this system feeds into OMS (see below) to enable the calculation of reliability reporting information;

- Outage Management System - - Endeavour Energy uses this system to log outages and other events on its network. From 2012-13 onwards this system has been used as the source of data for all reliability reporting; and

- Contact Centre 6 – Endeavour Energy's call centre uses this system to run reports on historical call volume according to skill set (Call Type). The system is also used to assign agents to specific call taking groups based on call type.

Data quality issues
In previous consultations on the RIN, we have raised significant concerns with providing data in the form required by the AER.

Approach to our obligations under the NEL
Our view of the NEL is that a DNSP is only obligated to provide information that is available, that is, data which has been historically collected in our systems. In cases, where that information cannot be provided in the form required by the AER from our systems, we would have a reasonable excuse under section 28(5) of the NEL not to comply with that element of the notice. We have strong doubts that a RIN can require a business to prepare information by way of estimate that cannot be reasonably derived from information currently held in its systems.

Our understanding of the term 'prepare' relates to a power the AER has to compel a DNSP to collect information in the form required by the AER for future periods (for example, by developing new systems) rather than to manipulate historical data in potentially inaccurate ways. We suggest that the AER should give more careful consideration to whether it has appropriately informed itself of the distinction under section 28D of the NEL between the ability of a RIN to require existing information to be provided and the ability to require information to be prepared, maintained and kept on a going forward basis.

Recognition by AER that 'best estimates' are not robust
The AER has acknowledged that if we are compelled to provide best estimates then there is potential for the data to lack robustness. Endeavour Energy will address the implications of using best estimates which are not robust in its Basis of Preparation to accompany the final Audited Information.

Worksheet 2.11 - Labour

2.11.3.1 Opex and 2.11.3.2 Capex

Compliance with requirements of the notice

The data presented in tables 2.11.3.1 and 2.11.3.2 is consistent with the requirements of the Annual RIN. In particular:

- Only costs allocated to the provision of standard control services are reported in the labour/non labour expenditure split tables;
- Labour costs consist of salaries and wages, overtime, allowances, recruitment costs, redundancy costs, personal protective equipment, oncosts, taxes, superannuation and labour hire costs; and
- The allocation of non-labour expenditure into controllable and uncontrollable is line with AER definitions. Uncontrollable non-labour expenditure are costs that Endeavour Energy has no control over e.g. Council Rates, water rates, electricity rates etc.

Source of information

Labour and non-labour expenditure was extracted from two reporting cubes in TM1 (PNL cube and AER Totex by Account cube). Endeavour Energy uses TM1 for various purposes including budgeting and forecasting, monthly reporting and regulatory account allocations and it has been used historically to provide data for previous audited Regulatory Accounts / RINs. It is a cube based technology which allows rules to be created between cubes and within cubes.

In addition, information from Work orders and Projects was utilised for table 2.11.3.2 which is extracted directly from a MS Access query against the SQL server database which is extracted nightly from Ellipse. The specific query is run on parameters specified to extract the data.

Methodology and assumptions

The following tables set out the methodology applied to obtain the required data for tables 2.11.3.1 and 2.11.3.2

.

Table	Methodology	Assumptions
2.11.3.1 - Opex	1. Extract standard control opex at the expense element level from the *AER totex by account* cube in TM1. 2. Classify each expense element into one of the following categories based on the AER definitions provided for each category. • In-house labour expenditure; • Labour expenditure outsourced to related parties; • Labour expenditure outsourced to unrelated parties; • Controllable non-labour expenditure; or • Uncontrollable non-labour expenditure.	The allocation of expenditure into controllable vs uncontrollable was done based on the descriptions assigned to each expense element considering the definitions provided by the AER in the Annual Regulatory information notice.

Table	Methodology	Assumptions
	3. Summarise the category totals and populate table 2.11.3.1.	
2.11.3.2 - Capex	1. Extract standard control capex at the expense element level from the *PNL* cube in TM1. 2. Classify each expense element into one of the following categories based on the AER definitions provided for each category. • In-house labour expenditure; • Labour expenditure outsourced to related parties; • Labour expenditure outsourced to unrelated parties; • Controllable non-labour expenditure; or • Uncontrollable non-labour expenditure. 3. Extract alternate control services and unregulated services capex transactions from ellipse. Summarise by expense element and subtract from the totals extracted from the TM1 *PNL* cube. 4. Summarise the category totals and populate table 2.11.3.2.	The allocation of expenditure into controllable vs uncontrollable was done based on the descriptions assigned to each expense element considering the definitions provided by the AER in the Annual Regulatory information notice.

Use of estimated information

None.

Reliability of information

Expense element data represents actual Information extracted from Endeavour Energy's reporting systems. Although assumptions were required to classify the data into the controllable and uncontrollable classifications levels required by the AER there were no other alternatives available to present the data in the form required by the AER. Therefore the data provided is considered to be reliable.

Worksheet 3.6 – Quality of Services

3.6.6.1 Technical Quality of Supply

Compliance with requirements of the notice
The data provided is compliant with the definitions and requirements of the notice.

Source of information
Information is sourced from the 'Satisfy Database'. Satisfy is the complaints database used to log all customer complaints and compliments. Complaints are logged under a 'root cause' tree, based on the description of the problem by the customer.

Methodology and assumptions
All complaints are logged into the 'Satisfy System' database
Pivot table report of the complaints logged into 'Satisfy' displaying all complaints for the financial year, is searched for complaints regarding 'voltage variation'.

Use of estimated information
There is no estimated data in this worksheet.

Reliability of information
The complaints are catergorised based on the description of the issue by the customer. The root cause can be adjusted after the initial logging of the complaint if the investigation determines that the complaint should be logged against a different root cause.

3.6.7.1 Timely Provision of Services

Compliance with requirements of the notice
The number of connections made: 0
The number of connections not made on or before the agreed date: 0

Source of information
ASP SP114800 Endeavour Energy
eNOSW Console

Methodology and assumptions
Number of connections taken directly from a search in the eNOSW Console for contestable service work submissions

Use of estimated information
No estimated information used

Reliability of information
eNOSW Console is an Endeavour Energy program for processing notifications of contestable service works submissions.

Note:
Final connections are arranged by Customers through a contestable accredited service provider and the date of connection is the date that they can arrange. EE do not stipulate a date of connection and merely provide agreement that the customer may connect.

3.6.7.2 Timely Repair of Faulty Street Lights

Compliance with requirements of the notice
The data provided for “Street lights - average monthly number out” and “Street lights - average number of days to repair” (Table 3.6.7.2) has been reported for the period 1 July 2017 to 30 June 2018 to represent the current year 2018. The monthly figure is arrived at by dividing the full year data by 12. Street lights – not repaired by “fix by” date is also averaged to the monthly data. The “Total number of street lights” has been reported as of the 30 June 2018 to represent the year 2018.

Source of information
The “Street lights - average monthly number out” and “Street lights - average number of days to repair” is extracted from predefined query developed for the purpose of extracting this and similar data in a controlled and consistent manner (established by Endeavour Energy’s IT department) using the organisation’s COGNOS 10 program. COGNOS 10 extracts this data from Ellipse (the organisations asset management database).

Street lights – not repaired by “fix by” date is extracted from the report prepared by Investigation Analyst - Complaints, Endeavour Energy. The data for the year 2018 (1 July 2017 to 30 June 2018) is averaged out to per month. This information is also stored in the Content Server, the Endeavour Energy’s secure central location for storing, sharing and distributing information. “Total number of street lights” is extracted from the financial year end monthly report of Street Light Usage of System (SLUoS) for the month of June 2018 and prepared by Network Revenue Analyst, Commercial Finance. This report relies on the Ellipse data base of Endeavour Energy.

Methodology and assumptions
For the purpose of this submission, the data is extracted for the period 1 July 2017 to 30 June 2018 for considering it as the year 2018.

Use of estimated information
Estimation was not necessary.

Reliability of information
The data within COGNOS 10/Ellipse is considered reliable and is Endeavour Energy’s main source of asset/financial data. Historical data is frequently applied for budgeting and forecasting.

3.6.7.3 Call Centre Performance

Compliance with requirements of the notice
The data provided is compliant with the definitions and requirements of the notice.

Source of information
Information was sourced from MyNetFone Precision Analytics, Verint and Cisco applications.

Methodology and assumptions
- Calls to fault line is a sum of monthly report figures of calls to the 131003 number taken from MyNetFone PA reports;
- Calls answered in 30 seconds applies only to those calls where a customer elected to speak to a consultant after listening to the IVR message (including those instances where the IVR provided detailed information concerning their outage). This data was sourced from the Cisco reporting application;
- Average wait time before call answered applies only to those calls where a customer elected to speak to a consultant after listening to the IVR message (including those

instances where the IVR provided detailed information concerning their outage). This data was sourced from the Verint application;

- Overload events was recorded from the Cisco application; and

- Percentage calls abandoned applies only to those calls where a customer elected to speak to a consultant after listening to the IVR message (including those instances where the IVR provided detailed information concerning their outage). This data was sourced from the Cisco reporting application. It is assumed that customers that don't elect to queue to speak with a consultant are satisfied with the level of outage information provided by the IVR.

Use of estimated information
There is no estimated data in this worksheet.

Reliability of information
All data comes directly from the reporting systems.
We had two telephony outages during the year where data has been excluded;

On the 23 March 2018, data was lost between 1:30am and 10:15am, caused by ICT server patching.

On the 26 April 2018, data between midnight and 8:25am had to be excluded, due to a fault with our telephony carrier.

Worksheet 3.6.8 – Network Feeder Reliability

Applicable to the 2014-15, 2015-16, 2016-17 and 2017-18 Annual Reporting RINs

Compliance with requirements of the notice

Reported SAIDI/SAIFI complies with the requirements of the RIN. The following aspects are noted:

- excluded incidents detailed in table 6.8 have been determined in accordance with the requirements of the STPIS (3.3a);
- Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3b) – and as per Endeavour Energy distribution determination 2015−16 to 2018−19 – Service target performance incentive scheme April 2015;
- the determination allows for the alternative Box cox methodology. The process is described in WPB 1012 – Calculation of Major Event Day Threshold;
- outages affecting single premises – Single premise outages that occur as a result of a fault on Endeavour Energy's network are included in the 2014-15, 2015-16, 2016-17 and 2017-18 reliability result;
- subsequent interruptions caused by network switching during fault finding, in general switching operations associated with an unplanned incident may include subsequent interruptions to customers that are associated with fault finding. Current systems do not have any facility to identify these operations and therefore exclude them from reliability calculations. It should be noted that removing these operations from reliability calculations would result in an inaccurate record of actual customer experience; and
- unplanned interruptions are sustained interruptions greater than one minute in accordance with the SAIDI definition in appendix A of the STPIS.

Source of information

1. Base outage data (customers interrupted and CMI)

   Data sourced from OMS. All records in this database were validated and checked in accordance with a Work Place Instruction WPB1014.

   Reporting tool – Cognos 10

2. Customer numbers for calculation of SAIDI and SAIFI

   Customer numbers used to calculate SAIDI and SAIFI were average customer numbers for the relevant reporting period and were sourced from customer numbers in the OMS Archive database

Methodology and assumptions

Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3b) – and as per Endeavour Energy distribution determination 2015−16 to 2018−19 – Service target performance incentive scheme April 2015.

Excluded interruptions – Reporting tool Cognos 10 identifies excluded interruptions based on a cause that is assigned to each interruption in accordance with STPIS 3.3a.

All the information provided represents actual information extracted from Endeavour Energy's reporting systems and reconciled to reported figures in previous audited RINs. As a result, the information contained is considered to be reliable cognisant of the comments made above.

Energy not supplied - Unplanned – OMS customer minutes off supply used to calculate unplanned energy not supplied in sheet 3.6.8

Energy not supplied – Planned for sheet 3.6.8 – Customer minutes off supply used to calculate planned energy not supplied in sheet 3.6.8

This data is supplied by System Control

Methodology and assumptions

Average annual consumption of **all** customers was divided by the number of customers, average days of supply and minutes per day (1440) to obtain an average kWh per minute consumption per customer, for each reporting period.

Average kWh per minute per customer was then multiplied by the number of customers interrupted and the duration of the interruption to determine kWh energy not supplied (expressed as MWh in the RIN).

Consumption data per customer is based on Domestic Controlled Load, Domestic General Rate, Commercial General Supply non TOU and Commercial General Supply TOU.

Excluding Unmetered (a summated figure) and Industrial load based on the assumption that the majority of industrial load has either a backup supply or is on dedicated feeders that have high reliability. Including this load would over state load lost to other customers.

The method that Endeavour Energy has adopted is a variant of the AER's option 1, using averaged customer consumption data.

Use of estimated information

Endeavour Energy has used estimated information for table 3.6.8 (energy not supplied columns). An estimate was required because we were unable to apply current or historical data to get actual information in accordance with the AER prescribed options.

Limitations included:
available data in large volumes and separated across different information systems; and
merging data sets unmanageable and requires a large degree of assumptions to be made.

Worksheet 3.6.9 – Network Reliability

Applicable to the 2014-15, 2015-16, 2016-17 and 2017-18 Annual RINs

3.6.9.1 Planned Minutes off Supply (SAIDI) and 3.6.9.2 Planned Interruptions to Supply (SAIFI)

Compliance with requirements of the notice

Reported SAIDI/SAIFI complies with the requirements of the RIN. The following aspects are noted:

- excluded incidents detailed in table 6.8 have been determined in accordance with the requirements of the STPIS (3.3a);
- Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3b) – and as per Endeavour Energy distribution determination 2015−16 to 2018−19 – Service target performance incentive scheme April 2015;
- the determination allows for the alternative Box cox methodology. The process is described in WPB 1012 – Calculation of Major Event Day Threshold;
- outages affecting single premises – Single premise outages that occur as a result of a fault on Endeavour Energy's network are included in the 2014-15, 2015-16, 2016-17 and 2017-18 reliability result;
- subsequent interruptions caused by network switching during fault finding, in general switching operations associated with an unplanned incident may include subsequent interruptions to customers that are associated with fault finding. Current systems do not have any facility to identify these operations and therefore exclude them from reliability calculations. It should be noted that removing these operations from reliability calculations would result in an inaccurate record of actual customer experience; and
- unplanned interruptions are sustained interruptions greater than one minute in accordance with the SAIDI definition in appendix A of the STPIS.

Source of information

1. Base outage data (customers interrupted and CMI)

   Data sourced from OMS. All records in this database were validated and checked in accordance with a Work Place Instruction WPB1014.

   Reporting tool – Cognos 10

2. Customer numbers for calculation of SAIDI and SAIFI

   Customer numbers used to calculate SAIDI and SAIFI were average customer numbers for the relevant reporting period and were sourced from customer numbers in the OMS Archive database

Methodology and assumptions

Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3b) – and as per Endeavour Energy distribution determination 2015−16 to 2018−19 – Service target performance incentive scheme April 2015.

Excluded interruptions – Reporting tool Cognos 10 identifies excluded interruptions based on a cause that is assigned to each interruption in accordance with STPIS 3.3a.

All the information provided represents actual information extracted from Endeavour Energy's reporting systems and reconciled to reported figures in previous audited RINs. As a result, the information contained is considered to be reliable cognisant of the comments made above.

Worksheet 6.2 – Reliability & Customer Service Performance

Applicable to the 2014-15, 2015-16, and 2016-17 Annual RINs

6.2.1 Unplanned Minutes off Supply (SAIDI), 6.2.2 Unplanned Interruptions to Supply (SAIFI) and 6.2.4 Distribution Customer Numbers

Compliance with requirements of the notice

Reported SAIDI/SAIFI complies with the requirements of the RIN. The following aspects are noted:

- Excluded incidents detailed in table 6.8 have been determined in accordance with the requirements of the STPIS (3.3a);
- Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3b) – and as per Endeavour Energy distribution determination 2015−16 to 2018−19 – Service target performance incentive scheme April 2015;
- The determination allows for the alternative Box cox methodology. The process is described in WPB 1012 – Calculation of Major Event Day Threshold;
- Outages affecting single premises – Single premise outages that occur as a result of a fault on Endeavour Energy's network are included in the 2014-15, 2015-16, and 2016-17 reliability result;
- Subsequent interruptions caused by network switching during fault finding, in general switching operations associated with an unplanned incident may include subsequent interruptions to customers that are associated with fault finding. Current systems do not have any facility to identify these operations and therefore exclude them from reliability calculations. It should be noted that removing these operations from reliability calculations would result in an inaccurate record of actual customer experience; and
- Unplanned interruptions are sustained interruptions greater than one minute in accordance with the SAIDI definition in appendix A of the STPIS.

Source of information

1. Base outage data (customers interrupted and CMI)

   Data sourced from OMS. All records in this database were validated and checked in accordance with a Work Place Instruction WPB1014.

   Reporting tool – Cognos 10

2. Customer numbers for calculation of SAIDI and SAIFI

   Customer numbers used to calculate SAIDI and SAIFI were average customer numbers for the relevant reporting period and were sourced from customer numbers in the OMS Archive database

Methodology and assumptions

Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3b) – and as per Endeavour Energy distribution determination 2015−16 to 2018−19 – Service target performance incentive scheme April 2015.

Excluded interruptions – Reporting tool Cognos 10 identifies excluded interruptions based on a cause that is assigned to each interruption in accordance with STPIS 3.3a.

All the information provided represents actual information extracted from Endeavour Energy's reporting systems and reconciled to reported figures in previous audited RINs. As a result, the information contained is considered to be reliable cognisant of the comments made above.

Worksheet 6.6 – STPIS Customer Service

6.6.1 Telephone Answering

Compliance with requirements of the notice
The data provided is compliant with the definitions and requirements of the notice.

Source of information
Information was sourced from the MyNetFone Precision Analytics and Cisco applications.

Methodology and assumptions

- Calls to fault line is a sum of monthly report figures of calls to the 131003 number taken from the MyNetFone PA daily reports;

- Calls received after removing excluded events. Excluded calls included calls to the IVR where customer did not elect to speak with a consultant as well as any calls where the customer abandoned the call within 30 seconds of queuing to speak with a consultant. There were no excluded days due to major events; and

- Calls answered in 30 seconds applies only to those calls where a customer elected to speak to a consultant after listening to the IVR message (including those instances where the IVR provided detailed information concerning their outage). This data was sourced from the Cisco reporting application. There were no excluded days due to major events.

Use of estimated information
There is no estimated data in this worksheet.

Reliability of information
All data comes directly from the reporting systems.

We had two telephony outages during the year where data has been excluded;

On the 23 March 2018, data was lost between 1:30am and 10:15am, caused by ICT server patching.

On the 26 April 2018, data between midnight and 8:25am had to be excluded, due to a fault with our telephony carrier.

Worksheet 6.7 – STPIS Daily Performance Data

6.7.1 Daily Performance Data - Unplanned

Compliance with requirements of the notice
The data provided is compliant with the definitions and requirements of the notice.

Source of information
Information was sourced from the Cisco application.

Methodology and assumptions

- Calls received after removing excluded events. Excluded calls included calls to the IVR where customer did not elect to speak with a consultant as well as any calls where the customer abandoned the call within 30 seconds of queuing to speak with a consultant. There were no excluded days due to major events; and

- Calls answered in 30 seconds applies only to those calls where a customer elected to speak to a consultant after listening to the IVR message (including those instances where the IVR provided detailed information concerning their outage). This data was sourced from the Cisco reporting application. There were no excluded days due to major events.

Use of estimated information
There is no estimated data in this worksheet.

Reliability of information
All data comes directly from the reporting systems.

We had two telephony outages during the year where data has been excluded;

On the 23 March 2018, data was lost between 1:30am and 10:15am, caused by ICT server patching.

On the 26 April 2018, data between midnight and 8:25am had to be excluded, due to a fault with our telephony carrier.

Worksheet 6.8 – STPIS Exclusions

Applicable to the 2014-15, 2015-16, 2016-17 and 2017-18 Annual RINs

6.8.1 STPIS Exclusions

Compliance with requirements of the notice

Reported SAIDI/SAIFI complies with the requirements of the RIN. The following aspects are noted:

- excluded incidents detailed in table 6.8 have been determined in accordance with the requirements of the STPIS (3.3a);
- Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3b) – and as per Endeavour Energy distribution determination 2015−16 to 2018−19 – Service target performance incentive scheme April 2015;
- the determination allows for the alternative Box cox methodology. The process is described in WPB 1012 – Calculation of Major Event Day Threshold;
- outages affecting single premises – Single premise outages that occur as a result of a fault on Endeavour Energy's network are included in the 2014-15, 2015-16, 2016-17 and 2017-18 reliability result;
- subsequent interruptions caused by network switching during fault finding, in general switching operations associated with an unplanned incident may include subsequent interruptions to customers that are associated with fault finding. Current systems do not have any facility to identify these operations and therefore exclude them from reliability calculations. It should be noted that removing these operations from reliability calculations would result in an inaccurate record of actual customer experience; and
- unplanned interruptions are sustained interruptions greater than one minute in accordance with the SAIDI definition in appendix A of the STPIS.

Source of information

1. Base outage data (customers interrupted and CMI)

   Data sourced from OMS. All records in this database were validated and checked in accordance with a Work Place Instruction WPB1014.

   Reporting tool – Cognos 10.

2. Customer numbers for calculation of SAIDI and SAIFI

   Customer numbers used to calculate SAIDI and SAIFI were average customer numbers for the relevant reporting period and were sourced from customer numbers in the OMS Archive database.

Methodology and assumptions

Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3b) – and as per Endeavour Energy distribution determination 2015−16 to 2018−19 – Service target performance incentive scheme April 2015.

Excluded interruptions – Reporting tool Cognos 10 identifies excluded interruptions based on a cause that is assigned to each interruption in accordance with STPIS 3.3a.

All the information provided represents actual information extracted from Endeavour Energy's reporting systems and reconciled to reported figures in previous audited RINs. As a result, the information contained is considered to be reliable, cognisant of the comments made above.

Worksheet 6.9 – STPIS Guaranteed Service Level

6.9.1 Guaranteed Service Levels – Jurisdictional GSL Scheme

Street lights

"Street lights "out" during period" is arrived at in the same manner as in Table 3.6.7.2 above with difference that the figure in 6.9.1 represents the full year data (as requested) while the figure is averaged out to monthly data for the table 3.6.7.2 (as requested).

Similarly, "Street lights not repaired by "fix by" date" is arrived at in the same manner as in Table 3.6.7.2 with difference that the figure in 6.9.1 represents the full year data for the same reason mentioned in the paragraph above.

"Street lights not repaired in 2 business days" is revised to 12 business days to align with the requirement of NSW Public Lighting Code. The information is arrived at as in the Table 6.6.3 above.

"Street lights – number of business days to repair" is arrived at as in Table 3.6.7.2.

"Street lights - GSL payments Volume" is extracted from the report prepared by Investigation Analyst - Complaints, Endeavour Energy. The data for the year 2018 (1 July 2017 to 30 June 2018) is averaged out to per month. This information is also stored in the Content Server, the Endeavour Energy's secure central location for storing, sharing and distributing information.

"Street lights - GSL payments Value of GSL payments" is based on "Volume of GSL Breaches" (in the paragraph above) multiplied by $15.00.

Worksheet 7.8 – Avoided TUoS Payments

7.8.1 Avoided TUoS Payments

Compliance with requirements of the notice

The data presented in table 7.8.1 contained in section 7.8 is consistent with the requirements of the Annual RIN. It represents the Avoided TUoS payments required to be paid by Endeavour Energy to the Embedded Generator(s) in accordance with clause 5.5(h) of the NER, as per below.

"*A Distribution Network Service Provider must pass through to a Connection Applicant the amount calculated in accordance with paragraph (i) for the locational component of prescribed TUoS services that would have been payable by the Distribution Network Service Provider to a Transmission Network Service Provider had the Connection Applicant not been connected to its distribution network ('avoided charges for the locational component of prescribed TUoS services').*"

Source of information

The information used to populate table 7.8.1 was extracted directly from TM1. Endeavour Energy uses this OLAP tool for various purposes including budgeting and forecasting, monthly reporting and regulatory account allocations and it has been used historically to provide data for previous audited Regulatory Accounts/RINs. It is a cube based technology which allows rules to be created between cubes and within cubes.

The information for worksheet 7.8 (Avoided TUoS payments) was extracted from the TM1 TUoS Reconciliation Cube. This cube is used by Endeavour Energy to store and report energy and demand import data from various connection points including embedded generators, as well calculate associated TUoS charges (i.e. Demand charges, Exit charges and General & Common Service charges) at the connection point level. It is the primary tool used to calculate the monthly avoided TUoS accrual for embedded generators at month end and is also used extensively for budgeting and forecasting TUoS related charges.

The data from TM1 TUoS Reconciliation Cube is also reconciled with the TM1 PNL cube which represents the values in the General Ledger.

Methodology and assumptions

The following methodology is used to calculate avoided TUoS payment which reflects the requirements of clause 5.5(i) of the NER:

- Extract half hourly generation data for each embedded generator and the associated Bulk Supply Points (BSP), i.e. the BSP which service the same area as the embedded generator, and calculate the peak demand for each BSP for the month;
- The energy generated by each embedded generator is adjusted by the relevant Distribution Loss Factor (DLF) in order to calculate the equivalent amount of energy which would have needed to have been supplied through the BSP;
- For each embedded generator, the Distribution Loss Factor (DLF) codes and corresponding values are obtained from the current AEMO Distribution Loss Factor Report;
- The grossed up energy for each embedded generator is added to the associated BSP to calculate the total amount of energy generated for the system area. In addition, the peak demand for the system area is also calculated;

- The peak demand for each system area is isolated (zeroing out all other half hourly intervals) and the peak demand contributed by the embedded generators is calculated as the difference between the peak demand for the system area less the peak demand for the relevant BSP;

- The proportional contribution of each embedded generator to the peak demand for the system area is calculated for the relevant half hourly interval. The proportional contribution of each embedded generator is multiplied by the peak demand contributed by all the embedded generators for the system area in order to calculate the avoided TUoS peak demand for each specific embedded generator and loaded in TM1 TUoS Reconciliation cube;

- The avoided TUoS peak demand amounts for each generator are multiplied by the relevant peak demand rates to calculate avoided TUoS charges in TM1 TUoS Reconciliation cube; and

- No assumptions are made and calculation is based on actual system import data for each connection points.

Use of estimated information

As per the definition of Actual Information provided in the Regulatory Information Notice issued under section Division 4 of Part 3 of the National Electricity (New South Wales) Law, Accruals & Provisions are considered as Actuals.

Endeavour Energy has not used estimated Information in completing table 7.8.1

Reliability of information

All the information provided represents Actual Information extracted from Endeavour Energy's reporting systems. As a result, the information contained in the table 7.8.1 is considered to be reliable.

Worksheet 7.10 – Jurisdictional Schemes

7.10.1 Jurisdictional Scheme Payments

Compliance with requirements of the notice
Endeavour Energy is required to list each relevant jurisdictional scheme individually and report information for each scheme separately from other schemes.

Endeavour Energy has provided information in accordance with this requirement. Endeavour Energy is subject to two jurisdictional schemes, in accordance with 6.18.7A(e)(2) and 6.18.7A(e)(3) of the Rules:

1. the NSW Solar Bonus Scheme (SBS); and
2. the Climate Change Fund (CCF).

Source of information
The NSW SBS closed 31 December 2016. See NSW Government website:

https://www.energy.nsw.gov.au/energy-consumers2/solar/solar-bonus-scheme/the-solar-bonus-scheme-is-closed

Endeavour Energy's payment to the CCF has been sourced from correspondence received from the NSW Minister for the Environment, Local Government and Heritage. Refer to Figure 1. Information on each schemes purpose and commencement has been sourced from NSW Government websites:

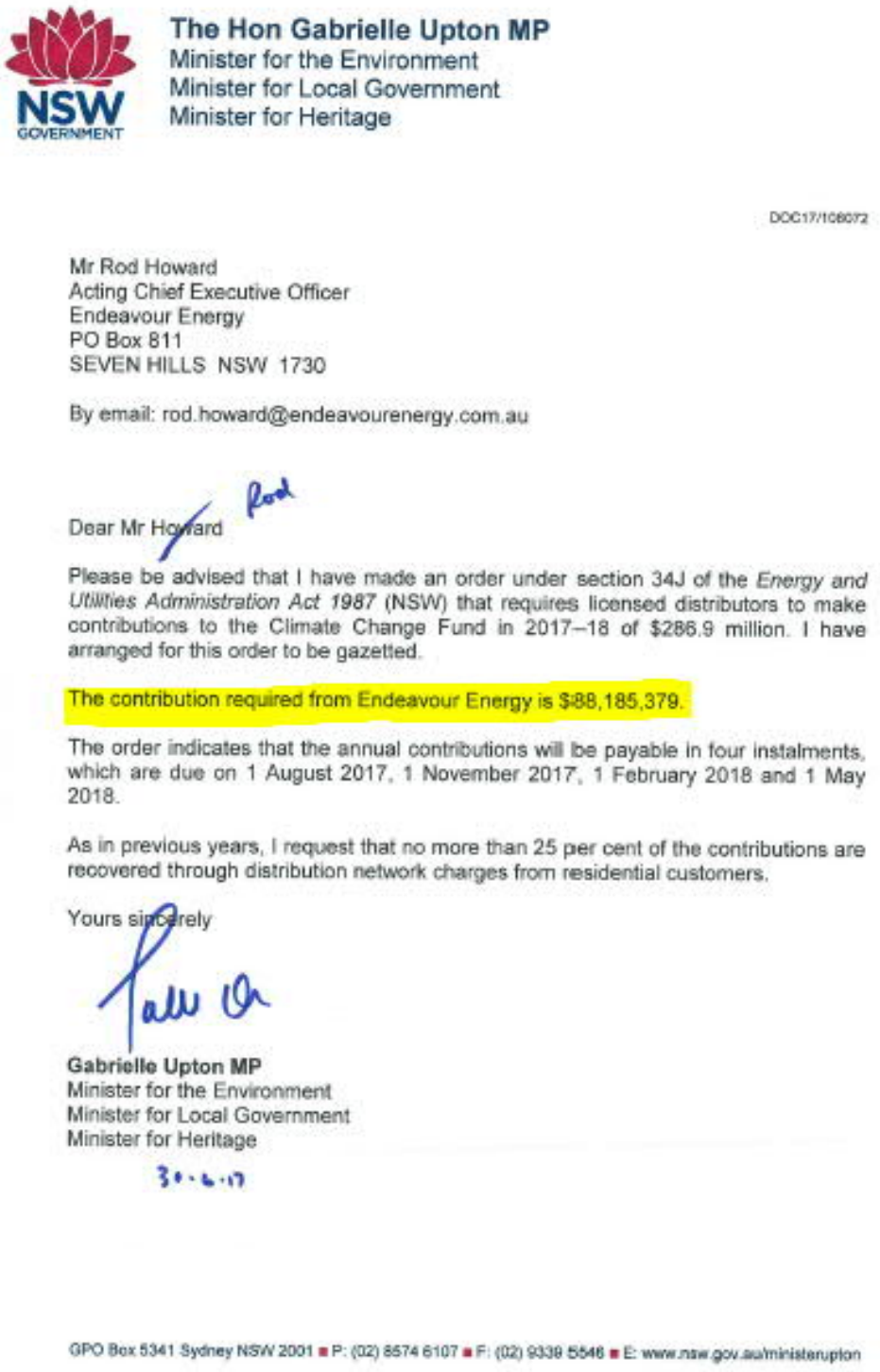
- SBS: https://www.energy.nsw.gov.au/energy-consumers2/solar/solar-bonus-scheme; and
- CCF: http://www.environment.nsw.gov.au/grants/ccfund.htm.

Methodology and assumptions
No assumptions have been made to complete this worksheet.

Use of estimated information
No estimates have been made to complete this worksheet.

Reliability of information
No estimates or assumptions have been made to complete this worksheet.

Figure 1: Correspondence received from NSW Minister for the Environment, Local Government and Heritage



The Hon Gabrielle Upton MP
Minister for the Environment
Minister for Local Government
Minister for Heritage

NSW GOVERNMENT

DOC17/108072

Mr Rod Howard
Acting Chief Executive Officer
Endeavour Energy
PO Box 811
SEVEN HILLS NSW 1730

By email: rod.howard@endeavourenergy.com.au

Dear Mr Howard Rod

Please be advised that I have made an order under section 34J of the *Energy and Utilities Administration Act 1987* (NSW) that requires licensed distributors to make contributions to the Climate Change Fund in 2017–18 of $286.9 million. I have arranged for this order to be gazetted.

The contribution required from Endeavour Energy is $88,185,379.

The order indicates that the annual contributions will be payable in four instalments, which are due on 1 August 2017, 1 November 2017, 1 February 2018 and 1 May 2018.

As in previous years, I request that no more than 25 per cent of the contributions are recovered through distribution network charges from residential customers.

Yours sincerely

Gabrielle Upton MP
Minister for the Environment
Minister for Local Government
Minister for Heritage

30.6.17

GPO Box 5341 Sydney NSW 2001 ■ P: (02) 8574 6107 ■ F: (02) 9339 5546 ■ E: www.nsw.gov.au/ministerupton

Worksheet 7.11 – Demand Management Incentive Scheme

7.11.1 DMIA – Projects Submitted for Approval

Endeavour Energy currently have three Demand Management Innovation Allowance (DMIA) projects, the Residential Battery Energy Storage Trial which commenced in FY16-17 and the Air Conditioner Control Trial using 3G DRED which commenced in FY17-18 and the Grid Connected Battery Energy Storage Trial which commenced in FY17-18. The total DMIA claim for FY17-18 is $877,449.

Project	Operating expenditure ($ nominal)	Capital expenditure ($ nominal)	Total expenditure ($ nominal)	New or Continuing
Residential Battery Energy Storage Trial	$464,551	$0	$464,551	Continuing
Air Conditioner Control Trial using 3G DRED	$228,864	$69,218	$298,082	New
Grid Connected Battery Energy Storage System	$0	$114,816	$114,816	New
Total	**$693,415**	**$184,034**	**$877,449**	

Background

This report has been prepared in accordance with the AER's Regulatory Information Notice in response to paragraph 6 of Schedule 1. The information provided will constitute the provision of an annual report for the purposes of paragraph 3.1.4.1 of the Demand Management Incentive Scheme (DMIS) applying to Endeavour Energy (as set out in the 2014-2019 Distribution Determination).

As per paragraph 6 of AER's Regulatory Information Notice Schedule 1, Endeavour Energy is requested to provide responses describing its expenditure and the nature of its demand management activities for review by the AER. The annual reporting requirements are outlined below.

Endeavour Energy's response on the Demand Management Incentive Allowance must include:

1. Identify each demand management project or program for which Endeavour Energy seeks approval;

2. For each demand management project or program identified in the response to paragraph 1:

   - explain:
     - how it complies with the Demand Management Innovation Allowance criteria detailed at section 3.1.3 of the demand management incentive scheme;
     - its nature and scope;
     - its aims and expected outcomes;
     - the process by which it was selected, including its business case and consideration of any alternatives;
       - *how it was/is to be implemented;*

- *its implementation costs; and*
- *any identifiable benefits that have arisen from it, including any off peak or peak demand reductions;*

o confirm that its associated costs are not:
- *recoverable under any other jurisdictional incentive scheme;*
- *recoverable under any other Commonwealth or State Government scheme; and*
- *included in the forecast capital or operating expenditure approved in the 2014-19 Distribution Determination or recoverable under any other incentive scheme in that determination; and:*

o state the total amount of the Demand Management Innovation Allowance spent in the Relevant Regulatory Year and how this amount has been calculated; and

3. Provide an overview of developments in relation to projects or programs completed in previous years of the regulatory control period, and of any results to date.

Previously Approved Projects

Residential battery energy storage trial

The Residential Battery Energy Storage Trial is focused on investigating how Endeavour Energy can use battery storage technology to reduce peak demand, improve power quality and defer or avoid capital investment in terms of technical viability and financial attractiveness to both the customer and the company.

Parklea Zone Substation (ZS) has been chosen for the trial as the area has an existing high penetration of solar systems with the potential to maximise the energy storage benefits for customers. The site is also identified as a future network constraint due to the increased growth from re-zoning and developments along the North West Rail corridor.

Endeavour Energy will offer a fixed subsidy of 75% on the purchase price of the supplied battery system to serve as an incentive to those participating in the trial. The 75% is based on the long-term cost of the battery energy storage system.

The recruitment target for this trial is 41 customers with existing PV systems.

Project scope includes:

- Recruit customers in the targeted area by developing the appropriate marketing material and recruitment systems;
- Engage a service provider, via the procurement process, to supply, install and commission battery energy storage systems of a suitable size at customers' premises, including the communications, control and signalling technology to ensure battery control and utilisation at the appropriate time;
- Collect and analyse customers' import and export energy consumption patterns;
- Quantify the total demand reduction in the targeted network area;
- Demonstrate the power quality benefits offered by battery energy storage systems;
- Model the technical benefits by developing network models utilising the data gathered from the trial;

- Determine the potential conflicts between parties wishing to access battery systems and how to manage conflicts; and

- Enhance the Demand Response Management System that manages the administration of customers and event signalling with a view to a large scale program implementation.

The deliverables of this project are to report on:

- The network demand reduction that can be reliably achieved by installing battery energy storage systems in residential premises and validating the average demand reduction per customer;

- The power quality benefits that battery energy storage systems can offer;

- The price point at which residential customers will pay for a battery energy storage system;

- Marketing and recruitment method for battery energy storage Demand Management programs; and

- The type and method of communication and control required to properly utilise the battery capacity.

The growth in residential developments particularly in Western Sydney highlights the need to upgrade network assets in the near future to accommodate the additional demand from new connections. The North West Rail corridor development has resulted in rezoning of the existing area to high and medium density housing and commercial development along the rail corridor. Parklea ZS is one of several zone substations supplying this area and is forecast to exceed its firm capacity due to the additional load from the re-development.

Parklea ZS supply area has 3,413 residential customers with PV installations, which represent around 1 out of 5 customers. This supply area has the highest penetration of PV within the Endeavour Energy distribution area.

This trial aims to understand energy storage technology and how Endeavour Energy can utilise it for peak demand reduction, power quality benefits and deferral of capital expenditure.

The trial will be implemented as follows:

- A service provider to supply, install and commission the battery energy storage systems will be selected through Endeavour Energy's procurement process;

- Customers within the target area will be invited to participate in the trial via a letter and promotional materials, customers with PV systems will be selected within the target area;

- The service provider will inspect the customer's premise to determine its eligibility for an installation;

- The service provider provides a quote to the customer, which includes the 75% subsidy from Endeavour Energy and asks the customer to agree on the program terms and conditions;

- The system is installed and commissioned; and

- Endeavour Energy sends an instruction to the battery systems through the communication and control platform to discharge the energy stored during times of peak demand.

The trial commenced on 1 December 2016 and will run for three summer periods. A post trial survey will be conducted during FY18-19. An evaluation report for the trial will be completed by July 2019.

The Residential Battery Energy Storage Trial has an estimated cost of $1,174,000 for FY16-17 to FY18-19 to be funded under DMIA.

Expenditure claim in FY17-18 is $464,551.41 in OPEX covering the costs for battery system supply, installation and commissioning, DRMS system enhancements, customer recruitment and project management. All expenses are accounted in several work orders linked to the project. The trial commenced in March 2017 and is currently operational. Endeavour Energy incentivised customers to join the program by subsidising 75% of the battery system cost. The 41 positions on the program were rapidly filled. Some customers who registered their interest to join the program had to be rejected due to the lack of a suitable location to install the battery and associated equipment. All systems were installed and commissioned by November 2017.

On nine hot days over the 2017-18 summer, Endeavour Energy has executed a 'peak demand event' day. On these event days, the batteries charge using excess solar generation throughout the day and discharge to the grid at a predefined period in the evening, generally from 4 to 8pm at 2.5kW rated power output. Further peak demand events will be called over the 2018 winter and then again in the 2018-19 summer.

Initial analysis of data from the nine peak demand events indicate batteries discharge at the requested power output for the first 2.5 hours, and then taper off. Different discharge periods, ambient temperature and output levels have not resulted in improved output. Consultation with equipment manufacturers and technology providers has established that the losses from the battery and inverter were the main contributors to the systems losses affecting the result. Flaws in the control system may also be a contributing factor. Further investigations and more peak demand events will be conducted over the 2018 winter and 2018-19 summer in order to fully understand the behaviour of the energy storage system.

New Projects for Approval

Air Conditioner Control Trial Using 3g Dred

Air conditioning load is the most significant contributor to peak electricity demand and correlates highly with hot days, which is when the capacity of the distribution system is at its lowest.

Endeavour Energy has developed several technologies and strategies over the years to enable residential demand management programs. These include PeakSaver, CoolSaver, PoolSaver and Endeavour Energy SolarSaver. It is expected that future demand management programs, particularly in the North West area of Sydney, will require a level of demand management that will need all programs working together. It has been identified that the proportion of available demand reduction available from air conditioners could be improved through the use of 3G Demand Response Enabling Device (DRED).

The trial will involve the control of AS 4755 compliant air conditioners in residential premises in order to reduce peak demand particularly during summer periods. A DRED will be installed and connected to the compliant air conditioner. The DRED offers the functionality to remotely switch the air conditioner into demand response mode 2 (DRM2) where it continues to provide cooling for the duration of the demand response event but limits the total electrical energy (kWh) consumed to 50% of its rated capacity. The DRED is capable of receiving instructions from SMS

messages via the 3G mobile communications network. Air conditioner control via DRED is more effective in terms of maintaining thermal comfort while reducing demand compared to the old method of switching off supply to the unit. The DREDs also offers flexibility of reducing demand from air conditioners by 25%, 50% and 100%.

Eligible residential customers in the target areas will be invited to participate in the program. Participants will receive cash incentives for signing up and remaining in the program for two summer periods. Endeavour Energy will work with air conditioner manufacturers, dealers, electrical retailers and builders to identify eligible customers and sign up 100 participants during the trial period.

The main objectives of the trial include quantifying the network demand reduction potential from controlling air conditioners using 3G DRED technology and testing the performance of the DRED and the reliability of using 3G mobile communications in performing demand response functions. The trial also aims to assess the willingness of customers to accept some level of external control of their air conditioner compared to previous trials and the possibility of implementing this technology as a cost-effective broad-based program.

Project scope includes:

- Recruit customers in the target areas by developing a marketing strategy and supporting collateral;
- Engage air conditioning dealers who have customers with AS 4755 compliant air conditioner installations within the target areas to inspect and validate the air conditioner's eligibility for the trial and install the DRED;
- Provide incentives to air conditioning dealers/installers to recruit participants;
- Engage electrical retailers and builders with customers that will be installing an AS 4755 compliant air conditioner, to recruit participants for the trial;
- Provide incentives to trial participants;
- Call peak demand event days when necessary;
- Identify potential issues with the solution (the DRED and 3G mobile communications);
- Collect and analyse customers' energy consumption data;
- Quantify the demand reduction in the target network areas;
- Conduct a customer survey at the end of the trial; and
- Prepare a project evaluation report at the end of the trial with the view of incorporating the learnings in future demand management programs.

The objectives of this trial are:

- To test the performance of 3G DREDs to limit the demand from AS 4755 compliant air conditioners during peak periods;
- To test the reliability of using mobile communication technology in demand control;

- To quantify the network demand reduction potential from installing 3G DREDs to control air conditioners in residential premises;

- To assess the willingness of customers to accept some level of external control of their air conditioner;

- To evaluate the effectiveness of recruiting customers through various channels, including air conditioning dealers, electrical retailers and builders; and

- To assess the possibility and cost-effectiveness of implementing air conditioning control using 3G DRED as part of a broad-based program.

Peak demand in Endeavour Energy's network area has grown significantly in greenfield development areas over the past decade, reflecting the transformation of rural and semi-rural land into new urban areas, and a continued growth and use of air conditioners. In addition, peak temperatures within Endeavour Energy's network area are typically higher and more sustained than in coastal areas, resulting in a significantly higher probability of extreme weather events, which contributes to the increased use of air conditioners. Peak demand is the primary driver of network augmentation investment, which contributes to electricity prices paid by consumers through the network component of electricity bills.

Data collected from the Energy Use and Conservation Survey conducted throughout Australia in March 2014 by the Australian Bureau of Statistics provides an estimate of the percentage of households with some form of air conditioning. In 2014, two out of three households in NSW or about 64%, had an air conditioner. A survey conducted in 2012 by an independent consultant identified that air conditioning penetration in Western Sydney is as high as 80%. It is believed that this figure would be higher in greenfield residential development sites.

The supply areas of Parklea, Penrith 11kV and Kingswood Zone Substations were identified as target areas for this trial. It is forecast that these zone substations will approach capacity limitations in the next two to five years. The Parklea ZS supply area is a more recent release area and is likely to contain higher penetration of AS4755 compliant air conditioners. However, the Penrith 11kV and Kingswood ZS area will provide a good insight into the penetration of AS4755 compliant air conditioners in more established areas.

The trial will be implemented as follows:

- Air conditioner dealers that service the target areas will be approached by Endeavour Energy to act as service providers for the program. Service providers will install the DRED to participants' air conditioners;

- Electrical retailers located within close proximity to the target areas that offer compliant air conditioners will be approached by Endeavour Energy to promote the program at the point of sale.

- Builders of new homes in the target areas who install compliant air conditioners will also be approached by Endeavour Energy to promote the program in their handover pack;

- Customers within the target area will be invited to participate in the trial via a letter and promotional materials and will be asked to register online.

- Once a customer registers, the service provider will conduct a site audit to check the customer's eligibility based on set criteria. A 3G DRED will be installed by the service

provider for eligible customers so Endeavour Energy can control the operation of the air conditioner during event days; and

- Endeavour Energy will manage the demand response events by sending a control signal to the DREDs

The trial commenced on 1 September 2017 and will run for two summer periods. A post trial survey will be conducted during FY18-19 and an evaluation report will be completed by September 2019.

The Air Conditioning Trial using 3G DRED has an estimated cost of $700,000 for FY17-18 to FY18-19 to be funded under DMIA.

Expenditure claim in FY 2017-18 is $228,864 in OPEX and $69,218 in CAPEX covering the costs for the supply and installation of DREDs, DRMS enhancements, project management, marketing and customer engagement and customer incentives. All expenses are accounted in several work orders linked to the project.

An evaluation report will be completed by September 2019.

Grid Connected Battery Energy Storage System (Bess) Trial
Battery storage can provide a number of network benefits to Endeavour Energy. Primary network benefits such as peak load lopping, voltage management, load balancing and reliability improvement can be realised in the foreseeable future and may reduce or defer investment decisions. There is strategic value in understanding the operation of battery storage in order to position the company to realise storage related opportunities and applications as they are developed.

Utilising a BESS to defer the construction of greenfield zone substation (ZS) is one such opportunity. In this application, the BESS can be used as an alternative to a Mobile ZS for deferral periods of up to 3 years. Short term demand growth can be met with supplementary supply from a BESS to defer both the augmentation of the existing network and the establishment of the final supply infrastructure.

Project scope includes:

- Identify the functional requirements of the BESS for connection and operation on Endeavour Energy's network;
- Procure a grid connected BESS with minimum of 1MWhr storage capacity, and 500kVA inverter, with a modular and transportable design;
- Deploy BESS onsite at West Dapto;
- Prove the BESS can provide 1MWh at a peak of 500kVA as required for peak shaving;
- Confirm round trip charge/discharge energy efficiency of 80%;
- Understanding the SCADA control and protection requirements for the grid connected BESS; and
- Test the voltage, power quality, power factor management and reliability support functions of the BESS.

Aims and expectations of the trial include:

- Determine the suitability for peak demand reduction and other network support applications such as voltage, power quality and power factor management;
- Test the use of battery storage as grid backup supply for reliability support;

- Gain an understanding of design considerations such as component losses, charge/discharge rates, system lifecycle, safety, installation, control and monitoring requirements, and any limitations of the equipment;

- Confirm the viability of a relocatable storage solution, in terms of cost and ease of relocation;

- Practicalities of installation, testing and commissioning;

- Check the maturity of the technology and suppliers in the Australian market;

- Understand the cost to procure a grid connected BESS; and

- Viability of intended primary application of the battery storage, that is as a tool to assist in deferral of Zone Substation construction.

Battery storage is approaching a price point that makes this technology a contender as an alternative network investment option. BESS' have the potential to provide NPV positive returns when used for ZS construction deferral and will also provide a potential opportunity return as the substations may be amalgamated, relocated or further deferred if load growth does not meet forecast levels.

It is in Endeavour Energy's interest to pilot grid connected storage to position the company to realise the benefits battery storage can provide such as peak shaving, reliability support, quality of supply improvement, and better understand the operational impacts of their application to our network.

West Dapto ZS, planned for construction in 2022, has been identified as a suitable location for the pilot. Pending successful testing of the BESS' peak lopping capability, the solution will remain onsite to alleviate demand growth in the West Lakes Illawarra development area and assist to defer West Dapto ZS construction.

- Develop a functional specification documenting the requirements of the BESS for connection and operation on Endeavour Energy's network;
- Tender for a grid connected BESS with minimum of 1MWhr storage capacity, and 500kVA inverter, with a modular and transportable design;
- Following selection of the supplier, finalise design of the solution to meet the BESS functional requirements;
- Work with the supplier to construct and test the BESS;
- Connect and commission the BESS onsite at West Dapto in time for Summer 2018-19; and
- Complete testing of the BESS functions by the end of the 2018-19 financial year.

The DMIA funded component of the Grid Connected Battery Energy Storage System trial has an estimated cost of $300,000 for FY17-18 to FY18-19. This is the cost for the engineering development and testing associated with deploying this new technology on the network. Equipment costs for this trial are not funded under DMIA.

Expenditure claim in FY17-18 is $114,816 in CAPEX covering the costs for engineering development works associated with the project. All expenses are accounted in work orders linked to the project.

An evaluation report will be completed by September 2019.

Statement

Endeavour Energy confirms the funding of the projects contained in this report are not:

a. recoverable under any other jurisdictional incentive scheme;

b. recoverable under any other state or Commonwealth government scheme; and

c. included in the forecast CAPEX or OPEX approved in the AER's distribution determination for the next regulatory control period, or under any other incentive scheme in that determination (such as the D-factor scheme for NSW).

Worksheet 8.1 – Income

8.1.1 Income Statement

Compliance with requirements of the notice

The data presented in Table 8.1.1 – Income Statement is consistent with requirements of the Annual Reporting RIN. In particular:

- Data presented in Table 8.1.1 – Income Statement covers the 2017-18 financial year with respect to financial information on revenue and expenditure relating to Standard Control Services, in accordance with the Cost Allocation Methodology (CAM); and

- Financial information provided relates to a breakdown of Revenue (such as Distribution Revenue, Customer contributions, Interest income, Jurisdictional scheme amounts and TUOS revenue), Expenditure (such as TUOS expenditure, Avoided TUOS expenditure, Depreciation, Finance charges, Maintenance and Operating expenses) and Income tax expense/(benefit)in accordance with the elements required in the template.

Source of information

Source information used to populate 8.1.1 Income Statement was extracted from:

a) the Annual Financial Statements to populate the "Audited Statutory Accounts";

b) the TM1 Financial Reporting system for the analysis of the Distribution business between Standard Control Services, Alternative Control Services and Unregulated Services (shown as "Adjustments" in the RIN Template); and

c) Excel work papers for certain adjustments and reconciliations.

Information Systems used include:

- Ellipse: Endeavour Energy's Enterprise Resource Management (ERM) system, with data extracted from the General Ledger module; and

- TM1: an OLAP tool used for various purposes including budgeting and forecasting, monthly reporting and regulatory accounts allocations. It is a cube based technology which allows rules to be created between cubes and within cubes.

The TM1 model splits the Income Statement into line items (i.e. rows) included within the annual AER RIN template, which reflects a different categorisation of revenue and expense items compared to normal internal management and statutory P&L formats.

Operating Expenditure

Operating Expenditure (Opex) was extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions, and the Cost Allocation Methodology (CAM).

Data was reconciled to Opex reported in the Management and Statutory results. Certain additional steps are performed as part of the Annual RIN process in order to calculate the required information:

1. Extract operating expenditure data from the relevant TM1 cube at the account code level. Extract the data as labour and non-labour line items;

2. Reconcile the total derived at the individual account code level to the total from the TM1 cube ("N Level" Org Units in TM1) to ensure no account codes have been excluded.

3. Reconcile the total derived at the individual account code level to the total operating expenditure reported in the management and statutory results;

4. Assign a regulatory accounts classification to the extracted TM1 data. This classification can be a direct network cost, direct network overhead or a corporate overhead cost. A direct network cost is assigned directly to a RIN category (e.g. maintenance & repair, emergency response etc);

5. Direct network overheads are the remaining network operating costs that cannot be allocated directly to a RIN category and are allocated on a pro rata basis based on the proportions of the direct allocation; and

6. Populate table 8.1.1.2 Expenditure with the results of the above steps in accordance with the RIN instructions & definitions.

Note: given the relevant TM1 cube data is available and based on actual operating expenditure results for the year and the approved CAM, all information provided for this table consists of actual information (no estimated information required).

Methodology and assumptions

Table	Methodology	Assumptions
8.1.1.1 Distribution Revenue	Distribution ("DUoS") revenue data was extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. DUoS is allocated as 100% Standard Control.	No assumptions required.
8.1.1.1 Cross Boundary Revenue	Endeavour Energy does not have any Cross Boundary Revenue – not applicable.	No assumptions required.
8.1.1.1 Contributions	Contributions - Capital Contributions are sourced from an Excel work paper which is based initially on Fixed Asset Reconciliations of the Ellipse data for Capital Contributions. The capital contributions are mapped in accordance with the Annual RIN Instructions and Definitions, and the results are ultimately uploaded into TM1 (as a % split of the total annual Capital Contributions). Data was reconciled to revenues reported in the Management and Statutory results.	No assumptions required.
8.1.1.1 Interest Income	Interest Income is extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. Interest Income is allocated as 100% Standard Control.	No assumptions required.

Table	Methodology	Assumptions
8.1.1.1 Jurisdictional Scheme Amounts	Jurisdictional Scheme Amounts are extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. Jurisdictional Scheme Amounts includes Climate Change Fund Recovery and Solar Bonus Scheme Recovery. CCF Recovery and SBS Recovery are both allocated as 100% Standard Control.	No assumptions required.
8.1.1.1 Profit from Sale of Fixed Assets	Profit from Sale of Fixed Assets is sourced from an Excel work paper which is based initially on Fixed Asset Reconciliations of the Ellipse data for Disposals. The profit from sale balances are mapped in accordance with the Annual RIN Instructions and Definitions, and the results are ultimately uploaded into the relevant TM1 cube. Allocation drivers are used to assign amounts to Standard Control Services, Alternative Control Services and Unregulated Services. Data was reconciled to revenues reported in the Management and Statutory results. Note that this line is only populated if there is a net profit from sale (i.e. if a net loss from sale section 8.1.1.2 Loss from sale of fixed assets is populated instead).	No assumptions required.
8.1.1.1 TUOS Revenue	Transmission Use of Service ("TUoS") revenue data was extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. TUoS is allocated as 100% Standard Control.	No assumptions required.
8.1.1.1 Pass through revenue (F-factor)	Endeavour Energy does not have any Pass through revenue (F-factor) – not applicable	No assumptions required.
8.1.1.1 Other Revenue	Other Revenues – sourced from the relevant TM1 cube, with the exception of an adjustment for Group Management Fee Income recovery revenues. Each account combination is allocated into Standard Control Services, Alternative Control Services and Unregulated Services, and further into RIN categories based on the nature of the revenue.	No assumptions required.

Table	Methodology	Assumptions
	Standard Control Services reconciles to Private power line and customer installation inspections, Monopoly Services, Emergency recoverable works and an allocation of Group Management Fee Income recovery revenues. Alternative Control Services revenue reconciles to Revenue from maintenance of public lighting, Metering Services Charges, Miscellaneous and Monopoly services income and an allocation of Group Management Fee Income recovery revenues. Unregulated Services reconciles to Customer funded connections, Customer specific services, Type 1-4 Metering services, TSA revenues, Other revenues and an allocation of Group Management Fee Income recovery revenues. Group Management Fee Income recovery is allocated based on an Excel work paper, using the Opex for the Group cost centres as the basis for the regulatory split. The resulting adjustments are used to “gross up” revenue since the recoveries are mapped to Opex for management reporting but to Other Revenue in the Annual RIN Income Statement.	
8.1.1.2 TUOS Expenditure	Transmission Use of System (“TUoS”) expenditure data was extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. TUoS expenditure is allocated as 100% Standard Control.	No assumptions required.
8.1.1.2 Avoided TUOS Expenditure	Avoided Transmission Use of System (“TUoS”) expenditure data was extracted from the TM1 TUoS Reconciliation cube and TM1 P&L cube. The data is prepared in accordance with the Annual RIN Instructions and Definitions. Avoided TUoS is allocated as 100% Standard Control. Data is cross-checked with confirmation from the Network Revenue Manager.	No assumptions required.

Table	Methodology	Assumptions
8.1.1.2 Cross Boundary Expenditure	Endeavour Energy does not have any Cross Boundary Expenditure – not applicable.	No assumptions required.
8.1.1.2 Depreciation	Depreciation & Amortisation is sourced from an Excel work paper which is based initially on Fixed Asset Reconciliations of the Ellipse data for Depreciation & Amortisation. The depreciation and amortisation balances are mapped in accordance with the Annual RIN Instructions and Definitions. Depreciation & Amortisation relating to system assets is directly allocated to Standard Control Services, and further causally allocated to Standard Control Services, Alternative Control Services and Unregulated Services based on usage, consistent with Property, Plant and Equipment allocations. Depreciation expense relating to non-system assets is causally allocated to services based on usage, consistent with Property, Plant and Equipment allocations. The results are ultimately uploaded into the relevant TM1 cube. Data was reconciled to the depreciation and amortisation expense reported in the Management and Statutory results.	No assumptions required.
8.1.1.2 Finance charges	Finance charges are extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. Borrowing costs are directly attributable to Standard Control Services due to their relationship with investments and the underlying network assets that are funded by interest bearing debt facilities. Data was reconciled to Finance charges reported in the Management (Net Finance expense i.e. net of interest income) and Statutory results (Interest Income is classified under revenues).	No assumptions required.

Table	Methodology	Assumptions
8.1.1.2 Impairment Losses	Impairment losses are extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. Data was reconciled to impairment losses reported in the Management and Statutory results (where impairment losses are applicable).	No assumptions required.
8.1.1.2 Jurisdictional Scheme Amounts	Jurisdictional Scheme Amounts are extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. Jurisdictional Scheme Amounts includes Climate Change Fund expense and Solar Bonus Scheme expense. CCF Expense and SBS Expense are both allocated as 100% Standard Control.	No assumptions required.
8.1.1.2 Loss from Sale of Fixed Assets	Loss from Sale of Fixed Assets is sourced from an Excel work paper which is based initially on Fixed Asset Reconciliations of the Ellipse data for Disposals. The loss from sale balances are mapped in accordance with the Annual RIN Instructions and Definitions, and the results are ultimately uploaded into the relevant TM1 cube. Allocation drivers are used to assign amounts to Standard Control Services, Alternative Control Services and Unregulated Services. Data was reconciled to loss on disposal reported in the Management and Statutory results. Note that this line is only populated if there is a net loss from sale (i.e. if a net profit from sale section 8.1.1.1 Profit from sale of fixed assets is populated instead).	No assumptions required.
8.1.1.2 Maintenance Expenditure	Maintenance Expenditure is extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. Maintenance Expenditure was “reconciled in total” to Total Opex reported in the Management and Statutory results.	No assumptions required.
8.1.1.2 Other Operating Expenditure	Other Operating Expenditure excluding Maintenance Expenditure is extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions.	No assumptions required.

Table	Methodology	Assumptions
	Other Operating Expenditure is adjusted for Group Management Fee Income recovery revenues. Other Operating Expenditure excluding Maintenance Expenditure was "reconciled in total" to Total Opex reported in the Management and Statutory results. Group Management Fee Income recovery is allocated based on an Excel work paper, using the Opex for the Group cost centres as the basis for the regulatory split). The resulting adjustments are used to "gross up" revenue since the recoveries are mapped to Opex for management reporting but to Other Revenue in the Annual RIN Income Statement.	
8.1.1.2 Other	Other Expenditure is extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. Other Expenditure was "reconciled in total" to Total Opex reported in the Management and Statutory results.	No assumptions required.
8.1.1.3 Income Tax Expense (/benefit)	Income Tax Expense (/benefit) is extracted from the relevant TM1 cube based on mappings in accordance with the Annual RIN Instructions and Definitions. Income Tax is pro-rated across the various regulatory segments based on their respective proportions of "Profit Before Tax". Income Tax Expense (/benefit) was "reconciled in total" to Income Tax Expense/(Benefit) reported in the Management and Statutory results.	No assumptions required.

Use of estimated information

Endeavour Energy has not used estimated information in determining a profit and loss split of Standard Control Services, Alternate Control Services and Unregulated Services for the period.

Material accounting policy changes

Endeavour Energy has not undertaken any material change in accounting policies which would impact data contained in Table 8.1.1 – Income Statement.

Reliability of information

All information provided is based on actual information extracted from the audited Annual Financial Statements and associated Ellipse general ledger records. As a result the information contained in Table 8.1.1 – Income Statement is considered to be sufficiently reliable.

Worksheet 8.2 – Capex

8.2.1 Capex by Purpose – Standard Control Services, 8.2.2 Capex by Purpose – Material Difference Explanation, 8.2.3 Capex – Other, 8.2.4 Capex by Asset Class, 8.2.5 Capital Contributions by Asset Class and 8.2.6 Disposals by Asset Class

Compliance with requirements of the notice

The data presented in tables 8.2.1, 8.2.2, 8.2.3, 8.2.4, 8.2.5 and 8.2.6 is consistent with the requirements of the Annual RIN. In particular:

- Only costs allocated to the provision of standard control services are reported in tables 8.2.1, 8.2.2 and 8.2.4 and costs allocated to the provision of alternate control services are reported in table 8.2.3;
- The categories listed in table 8.2.1 align to the categories in table 2.1 in the AER's April 2015 2014-19 Distribution Determination; and
- The asset classes in table 8.2.4 align with the asset classes set out in Endeavour Energy's PTRM and RFM issued with the AER's April 2015 2014-19 Distribution Determination.

Source of information

- CPI adjusted forecasts were sourced from tables 2.1- capex by purpose and table 6.2 – capital expenditure by asset class in Endeavour Energy's 2014-19 final determination folder on the AER website. These dollars are in real $1,314 and have been adjusted for actual CPI;
- Actual capital expenditure by purpose was sourced from Category Analysis RIN tables 2.1 – Expenditure Summary, 2.2 – Repex, 2.3 – Augex, 2.5 – Connections, 2.6 – Non-Network and 2.10 – Overheads, adjusted for the following changes due to the timing of the FY15 Annual RIN and Category Analysis RIN were required approximately 12 months apart;
- Work order and Project level data extracted directly from a MS Access query against the SQL server database which is extracted nightly from Ellipse. The specific query is run on parameters specified to extract the data; and
- Asset classes assigned to work orders were sourced from Cognos Impromptu. Cognos is a reporting tool used to extract data from Ellipse (ERP).

Methodology and assumptions

The following tables set out the methodology applied to obtain the required data for tables 8.2.1, 8.2.2, 8.2.3, 8.2.4, 8.2.5 and 8.2.6

Table	Methodology	Assumptions
8.2.1 – Capex by purpose – Standard Control Services	1. CPI adjusted forecast was sourced from tables 2.1- capex by purpose and table 6.2 – capital expenditure by asset class in Endeavour Energy's 2014-19 final determination on the AER website. 2. This forecast was then updated into nominal (14/15 dollars) using updated actual CPI escalation factors.	Variances exist between the Annual RIN and Category Analysis RIN due to the passage of time and the order of operations was changed. Variance exists between the Annual RIN and Category Analysis RIN as a consequence.

Table	Methodology	Assumptions
	3. Actual expenditure was sourced from category RIN tables 2.1 – Expenditure Summary, 2.2 – Repex, 2.3 – Augex, 2.5 – Connections, 2.6 – Non-Network and 2.10 – Overheads. 4. The split of actual expenditure by voltage level was done with input from the capacity planning manager.	
8.2.2 – Capex by purpose – Material Difference Explanation	1. System capex commentary was based on a comparison of the final AER determination (1516 RRP) vs actuals by project. 2. Non system capex commentary was based on a comparison of the final AER determination (1516 RRP version captured in TM1) vs actuals by activity (92) and sub activity (WC, WE, WF, WG and WH).	None.
8.2.3 – Capex Other	1. CPI adjusted forecast was sourced from the 1516 Revised Regulatory Proposal (RRP) and adjusted for actual CPI. 2. Actual expenditure was sourced from category RIN table 2.1 – Expenditure Summary.	None.
8.2.4 – Capex By Asset Class	**System Capex** 1. Extract all system capital work orders (activity 91) that incurred expenditure for the year from Ellipse via a MS access query. 2. Use Cognos impromptu to extract the asset classes assigned to each of these work orders. 3. Review the list of work orders with asset classes assigned and update any errors with the correct asset classes (e.g. some service wire replacement works were incorrectly mapped to public lighting instead of LV lines and cables). 4. For any work orders missing asset classes discuss with the relevant network staff to determine what asset class should be assigned.	None.

Table	Methodology	Assumptions
	5. Allocate capitalised overheads and switching on a proportional basis based on the direct costs on a work order over the total. 6. Map each asset class to a RAB category. Summarise the totals and populate table 8.2.4. **Non System Capex** 1. Extract all non-system capital transactions (activity 92) from Ellipse via a MS access query. 2. Assign each non system capex transaction to an asset class on the basis of sub activity 3. For any work orders missing asset classes discuss with the relevant network staff to determine what asset class should be assigned. 4. Apply the asset allocation drivers obtained from Financial Control to the transaction listing at the asset class level to determine the standard control component of each transaction 5. Summarise the standard control components for each RAB category and populate table 8.2.4.	
8.2.5 – Cap Contributions By Asset Class	1. Carry forward the live TM1 file from last financial year to the new financial year and update the year. 2. Obtain the capital contributions by asset class from TM1 (Cap Cons and TM1 tabs). 3. Check it reconciles in total.	None.
8.2.6 – Disposals By Asset Class	1. Carry forward the live TM1 file from last financial year to the new financial year and update the year. 2. Obtain the details of disposals by asset class and journals from the Fixed Assets team (Summary Excl non-true Disposals tab).	None.

Use of estimated information

None

Reliability of information

Information reported in tables 8.2.1, 8.2.2, 8.2.3, 8.2.4, 8.2.5 and 8.2.6 consists of Actual Information extracted from Endeavour Energy's reporting systems and reconciles to capex figures calculated and reported in the Category RIN. As a result, the information contained in those tables is considered to be reliable.

Worksheet 8.4 – Opex

8.4.1 Operating and Maintenance Expenditure by Purpose, 8.4.2 Operating and Maintenance Expenditure by Purpose – Margins Only, and 8.4.3 Operating and Maintenance Expenditure – Explanation of Material Difference

Compliance with requirements of the notice

The data presented in tables 8.4.1, 8.4.2 and 8.4.3 is consistent with the requirements of the Annual RIN. In particular:

- The categories listed in table 8.4.1 align to the categories identified in Endeavour Energy's regulatory proposal at table 3.2.1.1 current opex categories and cost allocations.

Source of information

- CPI adjusted forecasts were sourced from the final determination on the AERs website. These dollars are in real $1314 and have been adjusted for actual CPI; and

- Actual opex for standard and alternative control expenditure by purpose was sourced from the AER dollars by account cube in TM1. Endeavour Energy uses TM1 for various purposes including budgeting and forecasting, monthly reporting and regulatory account allocations and it has been used historically to provide data for previous audited Regulatory Accounts/RINs. It is a cube based technology which allows rules to be created between cubes and within cubes.

Methodology and assumptions

The following tables set out the methodology applied to obtain the required data for tables 8.4.1, 8.4.2 and 8.4.3.

Table	Methodology	Assumptions
8.4.1 – Operating & maintenance expenditure – by purpose	1. CPI adjusted forecast was sourced from table 8 in the AERs "Final decision Endeavour Energy distribution determination – overview" Table 8 (page 34) on the AERs website. 2. This forecast was then updated into nominal (14/15 dollars) using updated actual CPI escalation factors. 3. The forecast was pro-rated across the categories on the basis of the actual results as the AER's April 2015 determination did not provide the allowance by category, only as a total opex amount. 4. Actual expenditure for both standard and alternate control was sourced from AER Totex by account cube in TM1.	None.

Table	Methodology	Assumptions
8.4.2 – Operating & maintenance expenditure – by purpose – margins only	Nil to report.	None.
8.4.3 - Operating & maintenance expenditure – explanation of material difference	1. Operating and maintenance variance commentary was based on a high level analysis of the main factors driving the expenditure within each category.	None.

Use of estimated information

None

Reliability of information

Information reported in tables 8.4.1 and 8.2.3 consists of Actual Information extracted from Endeavour Energy's reporting systems and reconciles to opex figures calculated and reported in the Category RIN. As a result, the information contained in tables 8.4.1 and 8.4.3 is considered to be reliable.

There is nothing to report for table 8.4.2 for this reporting period.

Publication date
October 2018

Produced by
Endeavour Energy – Network Regulation Branch

Head Office
51 Huntingwood Drive
Huntingwood NSW 2148

PO Box 811, Seven Hills NSW 1730

Phone
131 081 or (02) 9853 6666
(8.00am – 5.30pm Monday to Friday)

Fax
(02) 9853 6000

Email
regcomplianceENDV@endeavourenergy.com.au