Endeavour Energy

BASIS OF PREPARATION
RESET REGULATORY INFORMATION NOTICE

1 JULY 2019 – 30 JUNE 2024

Submission date: 30 April 2018

PURPOSE

The Determination 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 May 2014.

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 in Table 1 below:

1.	Demonstrate how the information provided is consistent with the requirements of the Notice.
2.	Explain the source from which Endeavour Energy obtained the information provided.
3.	Explain the methodology Endeavour Energy applied to provide the required information, including any assumptions Endeavour Energy made.
4.	In circumstances where Endeavour Energy cannot provide input for a Variable using Actual Information, and therefore must use an estimate, explain: (i) why an estimate was required, including why it was not possible for Endeavour Energy to use Actual Information; and (ii) the basis for the estimate, including the approach used, assumptions made and reasons why the estimate is Endeavour Energy's best estimate, given the information sought in the Notice.

Structure of this document

The document is structured as follows:

- 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; and

- we set out our response to worksheets in accordance with the AER's instructions. We note that Worksheets 1 and 3 and Tables 2.16, 7.1, 7.2 and 7.3 do not require a Basis of Preparation to be provided as they are either contain forecast information or require no input material.

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 historical data in the form required by the AER. We will outline our concerns in relation to the detailed templates when we submit final audited data.

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.

WORKBOOK 1

Final Regulatory Information Notice – 1 – Reset

2.4 AUGEX MODEL

2.4.1 AUGEX MODEL INPUTS – ASSET STATUS – SUBTRANSMISSION LINES

Compliance with requirements of the notice

This section is intended to demonstrate how the information provided is consistent with the requirements of this Notice, specifically those set out in the relevant parts of Section 8.2 (a) to (f).

Specifically, Table 2.4.1 displays the following for the 2013-14 and 2017-18 years:

- each subtransmission line identified by a unique ID number and its originating and terminating points;
- each subtransmission line rating;
- subtransmission line maximum demand weather corrected at 50 per cent probability of exceedance; and
- the expected growth per feeder in the 2013-14 to 2017-18 period.

Source of information

The list of sub-transmission feeders in Table 2.4.1 was obtained from Endeavour Energy's Network Characteristics Database as of 1 September 2017. This database was also the source of route line lengths and line ratings. The Endeavour Energy Sub-Transmission Master load flow models for the respective years was used to calculate the weather corrected 50% POE maximum demand on the sub-transmission lines in the years covered by table 2.4.1. The Network Characteristics database also contains the weather corrected 50% POE historical maximum demand and the weather corrected 50% POE forecast maximum demand for each substation.

Where lines are removed or new lines constructed in the time period covered by Table 2.4.1, this is noted in the table data. Note also that network configurations can change significantly over the period studied and make the matching of lines to a "before" and "after" situation difficult in some cases. However, all lines are matched in the most appropriate way.

Line ratings were obtained from Endeavour Energy's Network Characteristics Database (current as of 1 September 2017). These are the line ratings used in augmentation planning and are calculated in accordance with standard industry methodologies (see standards references below). In situations where only the normal cyclic rating of a line is recorded in the database, the emergency rating of that particular line was assumed equal to the normal cyclic rating. For lines where ratings were not available, minimum ratings typical to the conductor type, construction and voltage were used. Note that where lines are comprised of different elements (eg a mix of conductor sizes), the overall line rating is that of the section with the lowest rating. The basis of ratings is presently as follows:

- Overhead lines – Mains Design Instruction 42, which in turn refers to ESAA publication D(b)5:1988 (Current rating of bare overhead line conductors) as the design basis; and
- Underground cables - Mains Design Instruction 46, which uses IEC 60287 as the design basis.

The Network Characteristics Database is progressively being brought up to full alignment with the standards regimes mentioned above.

Methodology and assumptions

For the 2017-18 financial year all parameters except the maximum demand values were obtained from the Circuit Sections table in the Network Characteristics database using a SQL query. The query performs the following:

- individual line sections are grouped by voltage, originating and terminating substation and are identified by their common group number. (All line sections with the same voltage and originating and terminating substation share the same group number);

- the length of each of the grouped line sections is summed resulting in the overall length of the Line group; and
- The minimum thermal rating and N-1 emergency rating of the grouped line sections is selected as the thermal and N-1 rating of the group.

For the 2013-14 financial year all parameters except the maximum demand values were obtained from the previous reset RIN.

The maximum demand on the sub-transmission lines was calculated by running load flows on the sub-transmission master model in the PowerFactory load flow package. The steps involved in the process were:

1. For the calculation of the 2017-18 maximum demands every substation in the latest load flow model was assigned with the 2017-18 financial year 50% POE weather corrected forecast loads.

2. To calculate the maximum demand on the 33kV and 66kV sub-transmission lines a load flow was performed with an undiversified loading configuration:

    - an undiversified loading configuration is where loads at the transmission substations are turned off and all the loads on the zone substations are turned on; and
    - the load is undiversified because all the zone substations are modelled with their maximum 50% POE loads at the same instant.

3. The undiversified (ZS) load flow is performed with summer and winter 50% POE loads.

4. The summer and winter loadings on each of the 33kV and 66kV lines is compared and the higher loading is taken as the peak 50% POE weather corrected maximum demand.

5. To calculate the maximum demand on the 132kV sub-transmission lines a load flow is performed with a diversified loading configuration:

    - a diversified loading configuration is where loads at the transmission substations are turned on and the loads at the 33kV and 66kV zone substations are turned off. This is required because the 132kV lines supply multiple zone substations simultaneously;

    - a diversified loading configuration is required to account for diversity in the time at which multiple zone substations reach peak demand; and

    - Note that the loads at 132kV zone substations remain on in this loading configuration.

6. The diversified (TS) load flow is performed with summer and winter 50% POE loads.

7. The summer and winter loadings on each of the 132kV lines is compared and the higher loading is taken as the peak 50% POE weather corrected maximum demand.

8. For the calculation of the 2013-14 maximum demands the Sub-transmission master model from late 2013 was assigned with 2013-14 financial year 50% POE weather corrected actual loads and steps 2 to 7 were repeated.

Reliability of information

The maximum demand on the lines was calculated using load flow software and is not directly measured or forecast. This methodology was used due to the difficulty in mapping SCADA data streams to all the individual sub-transmission feeders. However, this method is reliable as the transmission master models are verified by multiple individuals and are used extensively in planning studies. Furthermore, the process used to determine the maximum demands is similar to the process used for the transmission network planning review. However, the process used for this table only considers the normal network switching status; it does not consider contingency switching.

The attribution of “Urban”, “Long Rural” and “Short Rural” classifications to sub-transmission feeders is difficult due to the high mix of load types, and their relative magnitudes, at each location. The classifications entered are based on local understanding of the regions supplied and not strictly in accordance with any calculation methodology.

2.4.2 AUGEX MODEL INPUTS – ASSET STATUS – HIGH VOLTAGE FEEDERS

Compliance with requirements of the notice

This section is intended to demonstrate how the information provided is consistent with the requirements of this Notice, specifically those set out in the relevant parts of Section 8.3 (a) to (h).

Specifically, Table 2.4.2 displays the following:

- a row for each high voltage feeder on Endeavour Energy's network together with the required details;
- each high voltage feeder identified by a unique ID number;
- each high voltage feeder rating based upon the main trunk segment exiting the substation; and
- maximum demand measured at the feeder exit from its associated substation.

Source of information

The feeder data in table 2.4.2 was obtained from the Distribution Feeders table in the Endeavour Energy’s Network Characteristics Database as of September 2017. This table stores all the relevant parameters including feeder category, voltage, substations, length, rating and maximum demand which is obtained from the Historian network load database. The feeder total length and voltage are obtained by the Distribution Model Interface from GIS data .Historian is connected to Endeavour’s SCADA system and records the feeder circuit-breaker current readings at all the substations.

The actual maximum demand (in MVA) for each feeder was then calculated assuming that the loads on lines are balanced and the lines are operated at the rated voltage. The raw load data is filtered within the DSR preparation process to ensure that abnormal operating conditions are eliminated. This filtering includes a calculation that compares observed maximums on all feeders to ensure that no “outlying” result is included in the feeder maximum loads. In a small number of cases, load data has not been available and these instances have been noted in Table 2.4.2.

Feeder ratings are based on Endeavour Energy’s Mains Design Instruction No 11 (Underground distribution cables – continuous current ratings). The first section of each feeder from its source substation has been attributed a rating in accordance with its type and size and, for underground cables, includes a de-rating factor to allow for the close grouping of cables at the exit points from the substation. This rating is in accordance with the principles outlined in the above Design Instruction. A copy of this document can be made available if required.

Methodology and assumptions

As part of the annual DSR (Distribution Status Report) study a Python script is used to obtain the maximum demands of the HV feeders. In 2017 the steps involved are:

- for each feeder, the 3 phase current readings spanning summer and winter are downloaded from the Historian database;
- the raw current readings are resampled into 15 minute intervals;
- for each season, a peak current demand is selected via filtering process;
- the peak current demands and the associated date-time is stored in the network characteristics database; and
- the peak current demands are manually verified/corrected by the capacity planners.

With the 3 phase peak current demands obtained for each season, the seasonal MVA peak demands are calculated with the assumption the feeder is operating at nominal voltage (which is 11kV or 22kV depending on location). The maximum of the seasonal MVA peak demands is then taken as the maximum demand for the feeder.

Use of estimated information

No other estimated information has been used in this section.

Reliability of information

The data is sourced from GIS, Network Characteristics and SCADA which are considered reliable sources of data. The maximum demand data is soured from SCADA via direct measurement instruments attached to the network. Given the scale of the penetration of measurement, the SCADA data is high reliable. Furthermore, the maximum demand data is manually verified by capacity planners.

2.4.3 AUGEX MODEL INPUTS – ASSET STATUS – SUBTRANSMISSION SUBSTATIONS, SUBTRANSMISSION SWITCHING STATIONS AND ZONE SUBSTATIONS

Compliance with requirements of the notice

This section is intended to demonstrate how the information provided is consistent with the requirements of this Notice, specifically those set out in the relevant parts of Section 8.4 (a) to (h).

Specifically, Table 2.4.3 displays the following:

- a row for each subtransmission substation, subtransmission switching station and zone substation on Endeavour Energy's network together with the required details;
- number and rating of transformers at each location;
- maximum demand weather corrected at 50% probability of exceedance at each location; and
- average per annum growth in maximum demand from 2012-13 to 2018-19.

Source of information

The list of substations in Table 2.4.3 was obtained from Endeavour Energy's Network Characteristics Database as of September 2017. This database was also the source for equipment ratings.

For each of the years 2013-14 and 2017-18 the substation load forecasts have been provided. This is stored in the Network Characteristics Database and is sourced from the Endeavour Energy forecasting group.

Transformer ratings were obtained from Endeavour Energy's Network Characteristics Database (current as of September 2017). These are the ratings used in augmentation planning and are calculated in accordance with standard industry methodologies (see standards references below). Only the normal cyclic rating of a transformer is currently available and this is therefore assumed to be equal to the emergency rating of that particular unit. Transformer ratings are presently based on Australian Standard AS2374.7 (recently updated to AS60076.7).

Methodology and assumptions

The data for table 2.4.3 was obtained from the Network Characteristics Database using a SQL query. The query groups transformers in the database according to their substation. The ratings of the transformers are then summed to obtain the total ratings for the substation. The N-1 emergency rating of the substation is the summated in-service rating of all the transformers with the largest transformer considered out of service to represent a worst case N-1 scenario.

50% PoE demands for each substation location are directly available from Endeavour Energy's published forecast data, which includes weather corrected historic actual demands at all substation locations.

The Maximum demand (weather corrected at 50% PoE) of each substation for 2013-14 and 2017-18 was obtained from the published 2018-27 Summer and 2017-27 Winter forecasts. The maximum of either the summer or the winter forecast was selected to represent the greatest loading condition for the relevant years.

Forecast maximum demand growth rates are those reflected in Endeavour Energy's published forecasts and are therefore the most realistic expectation of demand at the time of responding to the regulatory information notice, and are the forecast maximum demands used in developing plans for augmentation capital expenditure.

It should be noted that, in all cases, the Substation "normal cyclic" has been assumed to be equal to the Transformer "normal cyclic" as there are no known locations where plant other than the transformers (eg bushings, cables etc) limits the delivery capacity of the transformers.

Use of estimated information
No other estimated information has been used in this section.

Reliability of information
The base origin of the transformer data presented is resident in Endeavour Energy's Network Characteristics Database. The data is therefore considered to be sound, however an expanded understanding of emergency ratings would be advantageous in assessing future actions in relation to transformer augmentations.

The forecast data is derived fundamentally from both metered and SCADA data sourced via direct measurement instruments attached to the network. Given the scale of the penetration of measurements, this network database is extremely powerful. As such, a strong foundation for the building of forecasting methodologies is available. More detail on the robustness of forecasting principles is included in regulatory templates 5.3 and 5.4.

2.4.4 AUGEX MODEL INPUTS – ASSET STATUS – DISTRIBUTION SUBSTATIONS

Compliance with requirements of the notice
The information provided on this work sheet is consistent with the requirements of this Notice and is based on the available information in Endeavour Energy.

Source of information
The maximum demand readings and the rated kVA of the distribution transformers were sourced from the Ellipse database.

Methodology and assumptions
The maximum demand readings were formerly done on a yearly basis for distribution transformers greater than 100kVA, but some transformer rated at ≤63kVA are read on need basis. A total of 22,917 readings were recorded in the Ellipse database for readings in 2012-13 against a total of 29,721 distribution transformers. Similarly, for 2008-09 it was 21,246 readings against a total of 27,005. However regular maximum demand readings have been suspended. The data in this table is derived from past readings and estimates.

The name plate ratings of the transformers were used for this table as it is not Endeavour's practice to use cyclic rating for distribution transformers. For the distribution transformers where maximum demand readings were not available, a diversity factor was applied to the transformer name plate rating.

The transformers in the distribution substations were categorised as pole sub or pad sub (ground mount) in locations fed by urban, rural short or rural long feeders with the following ratings:

- Pad subs <= 500kVA;
- Pad subs > 500kVA;
- Pole sub <=63kVA; and
- Pole sub <=400kVA (but >63kVA).

No weather corrected 50% POE utilisations were calculated as it is not Endeavour Energy's practice to use 50% POE in distribution substation planning.

The utilisation percentage was calculated based on the number of transformers in the utilization category against the total number of transformers for that regulatory period.

An example for 2017-18 as follows:

Utilization band	60 – 80%
Distribution subs – Urban Pad subs <= 500kVA	5.48%
Number of transformers from this category that is within 60-80% utilization	1,753
Total number of transformers in 2017-18	31,967
Percentage utilization within 60-80% = 1,753 / 31,967	= 5.48%

Use of estimated information

The maximum demand for transformers that do not have maximum demand readings for that period is estimated based on the location of the subs that are fed either by either urban or rural feeder.

The maximum demand is estimated as follows: (based on Branch procedure NCP1110):

- Urban subs: 80% of nameplate; and
- Rural: 70% of nameplate.

Reliability of information

The information is based on actual maximum demand readings taken by Endeavour Energy staff. There is a possibility of reading errors, faulty meters and high maximum demand due to temporary load transfer (this is evident in a small percentage of subs recording greater than 150% loading which needs to be verified). The lack of regular MDI readings will also impact the accuracy of the data. Future RIN submissions will utilise the DSUB load estimator which will estimate DSUB demands using interval meters when they become more widespread. The DSUB load estimator was not used for this submission as it is being re-implemented on new coding platform as part of an existing IT project.

2.4.5 AUGEX MODEL INPUTS – NETWORK SEGMENT DATA

Compliance with requirements of the notice

For this submission Endeavour Energy has utilised the following segments:

Network segment ID	Network segment title	AER segment group
1	Subtransmission lines	1
2	Subtransmission substations and subtransmission switching stations	2
3	Zone substations	3
4	High voltage feeders - CBD	4
5	High voltage feeders - urban	5
6	High voltage feeders - short rural	6
7	High voltage feeders - long rural	7
8	Distribution substations - CBD	8
9	Distribution substations - urban	9
10	Distribution substations - short rural	10
11	Distribution substations - long rural	11

Description of Network Segments

For this regulatory submission the Network segment and AER segment groups are identical.

Note: Endeavour Energy does not have any CBD feeders or distribution substations.

Source of information

The sources of information are:

- Project definitions
- Project definition cost estimates
- Actual costs
- PIP

Methodology and assumptions

Unit Costs and Capacity Factors

- AER Segment Group 1:
  - the historical capacity factor for transmission lines was determined by analysing a selection of projects which addressed capacity constrained sub transmission feeders. The source of information was the project definitions created at the time of project initiation and the project cost estimates at the time of project initiation;
  - from the project definition and the network needs report determine the capacity added e.g. a 15MVA line augmented to 20MVA – capacity added = 20MVA – 15MVA = 5MVA, capacity factor = Capacity Added/15 = 1.33. A new line built with a rating of 50MVA, the line that had constraints on it had a rating of 36MVA, capacity added = 50MVA, capacity factor = capacity added/36 = 1.38. An average of all projects capacity factors for that category was then calculated and is used in Table 2.4.5;
  - the historical average unit cost was obtained by dividing the historical expenditure for Subtransmission lines from table 2.4.6 by the capacity added in 2013-14 to 2016-17 period. The capacity added in this period was calculated using the figures in table 2.4.1;
  - the forecast capacity factor for future projects is considered the same as the calculated historical capacity factor; and
  - the forecast average unit cost was obtained by dividing the forecast expenditure for Subtransmission lines from table 2.4.6 by the associated capacity added values in the same table.
- AER Segment Group 2:
  - the historical average unit cost for subtransmission substations was obtained by dividing the historical expenditure for subtransmission substations from table 2.4.6 by the subtransmission substation capacity added in 2013-14 to 2016-17 period;
  - the historical capacity factor for sub transmission stations was determined by analysing a selection of projects which addressed capacity constrained sub transmission stations. The source of information was the project definitions created at the time of project initiation and the project cost estimates at the time of project initiation. In categories where there were no past projects the costs of another category have been used; and
  - the forecast average unit cost and capacity factor are assumed to be equal to the historical values as there are an insufficient number of transmission substations projects in the future for accurate calculations.
- AER Segment Group 3:
  - the historical average unit cost for zone substations was obtained by dividing the historical expenditure for zone substations from table 2.4.6 by the zone substation capacity added in 2013-14 to 2016-17 period;
  - the historical capacity factor for zone substations was determined by analysing a selection of projects which addressed capacity constrained zone substations. The source of information was the project definitions created at the time of project initiation and the project cost estimates at the time of project initiation. In categories where there were no past projects the costs of another category have been used;

   - the forecast average unit cost was obtained by dividing the forecast expenditure for zone substations from table 2.4.6 by the associated capacity added values in the same table; and

   - the forecast capacity factor is assumed to be equal to the historical capacity factor.

- AER Segment Group 5,6 and 7:
   - the unit costs and capacity factors for distribution lines was determined by analysing high voltage distribution feeder works items created in the last four years;

   - for each category of feeders the number of projects that created a new feeder (i.e. connection to a zone substation circuit breaker) was identified. From this the historical capacity added was calculated by multiplying the number of feeders added by the standard capacity of a feeder (4.5MVA). From the project description the number of overloaded feeders (at the zone substation circuit breaker) it was addressing was also noted. The capacity factor was obtained by dividing the number of new feeders created by the number of overloaded feeders addressed;

   - note that the capacity factor is assumed to be equal for all 3 feeder categories;

   - the historical average unit cost for each feeder category was obtained by dividing the historical expenditure for the feeder category from table 2.4.6 by the total feeder capacity added in 2013-14 to 2016-17 period;

   - note that the long rural historical average unit cost is assumed to be equal to the short rural unit cost because there were an insufficient number of long rural projects for an accurate calculation;

   - the forecast capacity factor is assumed to be equal to the historical capacity factor;

   - the forecast average unit cost was obtained by dividing the forecast expenditure for the feeders from table 2.4.6 by the associated capacity added values in the same table; and

   - note that the short rural and long rural forecast average unit costs are assumed to be equal to historical unit costs because there are an insufficient number of future short and long rural projects for an accurate calculation.

- AER Segment Group 9, 10 and 11:
   - the historical unit costs for distribution substations have been obtained from actual costs from sample projects. The historical capacity factor is calculated by the change in size of transformers for the categories. e.g. Overloaded 315kVA distribution substations will typically be upgraded to 400kVA;

   - the unit costs used for the various categories compare favourably to the Optimised Depreciated Replacement Costs Valuation of the Endeavour Energy network completed in 2010; and

   - the forecast unit costs and capacity factors are assumed to be equal to the historical values.

Utilisation Thresholds

- AER Segment Group 1
   - the utilisation threshold for 33kV feeders general was calculated by analysing past projects which addressed constraints on sub transmission feeders. The forecast load on the feeder three years ahead of the time of project initiation identified in the project's investment options report was divided by the rating of the feeder at the time of project initiation to determine the utilisation threshold. The load three years ahead was used as in general projects are initiated three years before the need for the project. In general the loads on

the feeder in project investment options reports only have feeder loads under n-1 conditions, to get the feeder load under n conditions the n-1 load was multiplied by 2; and

- for the 66kV lines and 132kV lines due to the limited number of projects a utilisation threshold mean of 60% which is based on the 120% of n-1 capacity limit placed by the previous licence conditions and utilisation threshold standard deviation of sqrt(60) has been used.

- AER Segment Group 2:
  - the utilisation threshold mean of sub transmission substations in general was calculated by analysing past projects which addressed constraints on sub transmission substation. The forecast load on the substation three years ahead of the time of project initiation identified in the project's investment options report was divided by the rating of the substation at the time of project initiation to determine the utilisation threshold. An average utilisation and standard deviation was calculated from these projects. The load three years ahead was used as in general projects are initiated three years before the need for the project; and

  - where there was a limited number of projects for analysis a utilisation threshold of 50% has been used as prescribed in the previous license conditions (100% of n-1 capacity).

- AER Segment Group 3:
  - The utilisation threshold mean of zone substations in general was calculated by analysing past projects which addressed constraints on zone substations. The forecast load on the zone substation three years ahead of the time of project initiation identified in the project's investment options report was divided by the rating of the zone substation at the time of project initiation to determine the utilisation threshold. An average utilisation and standard deviation was calculated from these projects. The load three years ahead was used as in general projects are initiated three years before the need for the project.

- AER Segment Group 5,6 and 7:
  - The utilisation threshold was determined by averaging the utilisation threshold of high voltage distribution feeder works items created in the last four years. This was calculated by dividing the load on the feeder at the time of project creation (obtained from the project reason for works description) by the standard 300A feeder rating.

- AER Segment Group 9, 10 and 11:
  - The utilisation threshold mean is based on an internal standard specifying utilisation thresholds of 100% for pad-mount substations and 110% for pole mount substations. The threshold standard deviation is the square root of the mean.

Use of estimated information

- The $/MVA for sub transmission lines, sub transmission/zone substations and HV feeders are based on estimated project costs.
- The $/MVA for distribution substations is based on actual costs for replacement/augmentation for projects over the last 4 years.

Reliability of information

The actual costs for the sub transmission lines, sub transmission/zone substations and HV feeders projects may differ from the estimates and this will change the $/MVA.

2.4.6 CAPEX AND NET CAPACITY ADDED BY SEGMENT GROUP

Compliance with requirements of the notice

This section is intended to demonstrate how the information provided is consistent with the requirements of this Notice, specifically those set out in the relevant parts of Section 8.7 (a) to (c).

Specifically, Table 2.4.6 displays the following over the requested time periods:

- The type of net capacity added (i.e. Types 1, 2 and 3 for each of the categories of subtransmission and zone substations and Types 1 and 2 for subtransmission lines)
- The costs for each line item in the table and which costs are attributed to “customer initiated” or “NSP initiated” capacity related augmentations.

Source of information

Project information has been gathered in a similar manner as that for Tables 2.3.1 and 2.3.2, that is, costs were obtained from financial data associated with the list of relevant projects that were completed (or are to be completed) within the requested time frames. Capacities added were obtained from project related information such as Network Investment Options Reports, Project Definitions, Transmission line designs and Post Commissioning Review Reports. Information related to HV feeder works was also obtained from the ‘Distribution Augmentation, Reliability and Refurbishment Tracking System’ (DARRTS).

Indexation data to allow the rationalising of the financial data into FY 2019 dollars was obtained from Endeavour Energy’s Finance section.
Equipment ratings were obtained from Endeavour Energy’s Network Characteristics Database as of September 2017.

Future expenditure profiles were obtained as follows:

- for Subtransmission lines, Subtransmission substations and subtransmission switching stations and Zone substations - from the data presented in Endeavour Energy’s latest version of the Strategic Asset management Plan (SAMP);
- for HV Feeders – growth to 2023/24 is based on projections in the 2016/17 issue of the Distribution Works Program. Growth in connection works is projected from the current SCI; and
- for distribution substations (including downstream LV network) – an equivalent growth rate to that developed for HV feeders has been used in forward projections.

Methodology and assumptions

Financial data was gathered on a project by project basis as well as an overall activity basis. Subtransmission Line, Subtransmission Substation, Zone Substation and HV feeder works were “NSP initiated” or “customer initiated” according the categorisation of the parent major project. This applies to both historical and future projects. Cost and capacity data for historical major projects is available from Network Characteristics and Project Definitions. Cost and capacity for forecast major projects is available from the SAMP.

Distribution feeder works associated with major projects were assigned an “urban”, “short rural” or “long rural” category according to categorisation of the supplying zone substation and were assigned a “NSP initiated” or “customer initiated” according the categorisation of the parent major project. The cost and category information for historical distribution feeder works including NSP initiated “Overloaded Feeders” and “Overloaded conductor” works were obtained from the DARRTS database. The cost and category information for future distribution feeder works was obtained from the distribution works program. The added capacities for historical and forecast feeder works are calculated by multiplying the number of feeders added by the standard capacity of a distribution feeder (4.5MVA).

The expenditure for distribution transformers is available as an overall activity basis. For the distribution transformer (including downstream LV network) category, the customer initiation proportion was provided using customer connection data that indicated a proportion of 90/10 customer/NSP ratio in this class. The urban/short rural/long rural split for distribution transformer (including downstream LV network) was determined by assessing the proportion of transformers that were installed on either urban or short rural feeders. The distribution transformer costing calculations were developed by using typical estimated unit costs per transformer scaled by the transformer numbers involved.

“Unmodelled augmentation” costs include non-capacity related distribution works, land and site purchase costs and cable ducts. The expenditure for non-capacity related distribution works is available as an overall activity basis whereas land and cable duct costs are available on a project basis.

Note that Endeavour Energy has no CBD feeders or transformers and these cells have been entered as “0”.

Use of estimated information

Apart from the assumptions mentioned above, no other estimated information has been used in this section.

Reliability of information

The base origin of the data presented in Table 2.4.6 is resident in Endeavour Energy’s Ellipse system which provides both financial tracking and project lists. Detailed analysis of the project lists within the Distribution Works Program were also utilised to provide more detailed understanding of proportional costs within the high voltage feeders area. The data is therefore considered to be reliable.

2.11 LABOUR

2.11.3 LABOUR/NON-LABOUR EXPENDITURE SPLIT FOR STANDARD CONTROL SERVICES

Compliance with requirements of the notice

The data presented in table 2.11.3 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

- Historical information for 2012-13 and 2013-14 were extracted from the PNL 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; and
- Historical information for 2014-15, 2015-16 and 2016-17 was sourced from the annual RINs.

Methodology and assumptions

The following tables set out the methodology applied to obtain the required data for table 2.11.3

Table	Methodology	Assumptions
2.11.3	**Years 2012-13 – 2013-14** 1. Extract total opex and 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 standard control totals for opex and capex from the category RINs for 2012-13 and 2013-14. 4. Pro rata the standard control totals across the totex amounts by expense elements.	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.

	5. Summarise the category totals and populate table 2.11.3. **Years 2014-15 – 2016-17** 1. Populate table 2.11.3 using the data reported in the annual RINs for each respective year.	

Use of estimated information

All historical information provided for the tables in section 2.1 consist of actual information (no estimated information required).

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. Future forecast information is considered to be estimated.

2.17 STEP CHANGES

2.17.5 FORECAST CATEGORY SPECIFIC OPEX

Compliance with requirements of the notice

The data presented in worksheet 2.17 is consistent with the requirements of the Reset RIN. In particular:

- Endeavour Energy has nil step changes to report in table 2.17.5.

4.3 ANCILLIARY SERVICES – FEE-BASED SERVICES & 4.4 ANCILLIARY SERVICES – QUOTED SERVICES

With reference to 2.53 of Appendix E relating to fee-based and quoted services listed in Workbook 1, Endeavour Energy makes reference to the following:

- AER's Framework & Approach paper 2019-2024;
- ANS Pricing Models (refer to Endeavour Energy – 14.10 ANS Pricing Models – April 2018 – Confidential); and
- Endeavour Energy's recent annual pricing proposal for the 2018-19 year.

6.1 TELEPHONE ANSWERING DATA

6.1.1 TELEPHONE ANSWERING DATA

Compliance with requirements of the notice

The information provided on this work sheet is consistent with the requirements of the Notice. The data was sourced from reports and systems which have been used to supply similar data for previous RIN's.

Source of information

Endeavour Energy obtained the information provided in this work sheet from various sources due to a system upgrade that took place on the 1/7/2015. The information prior to 1/7/2015 was obtained from the monthly Network call stats reports. The data was originally sourced from the 'Contact Centre 6 (CC6)' application, and the 'Intellemanager Web View Reporting' application. Endeavour Energy has two call centres at Huntingwood and Springhill, this data has been combined in response to this template. The information from the 1/7/2015 was obtained from the daily reports from MyNetFone Precision Analytics and Cisco reporting application. The contact centre now operates as one virtual centre.

Methodology and assumptions

Endeavour Energy applied the following methodology to provide the required information:

- Actual monthly and daily call data was used as the basis for the preparation of this data
- The excluded event dates were obtained from Endeavour's Asset Management area.

Use of estimated information

There is no estimated data in this worksheet.

Reliability of information

All data comes directly from the reporting systems. No manual manipulation is required.

7.4 SHARED ASSETS

7.4.1 TOTAL UNREGULATED REVENUE EARNED WITH SHARED ASSETS

Compliance with requirements of the notice

Requirement
It is understood that compliance with this requirement involves the following:

- Population of Regulatory Template 7.4

Demonstrated Compliance
- Compliance has been demonstrated by populating the template

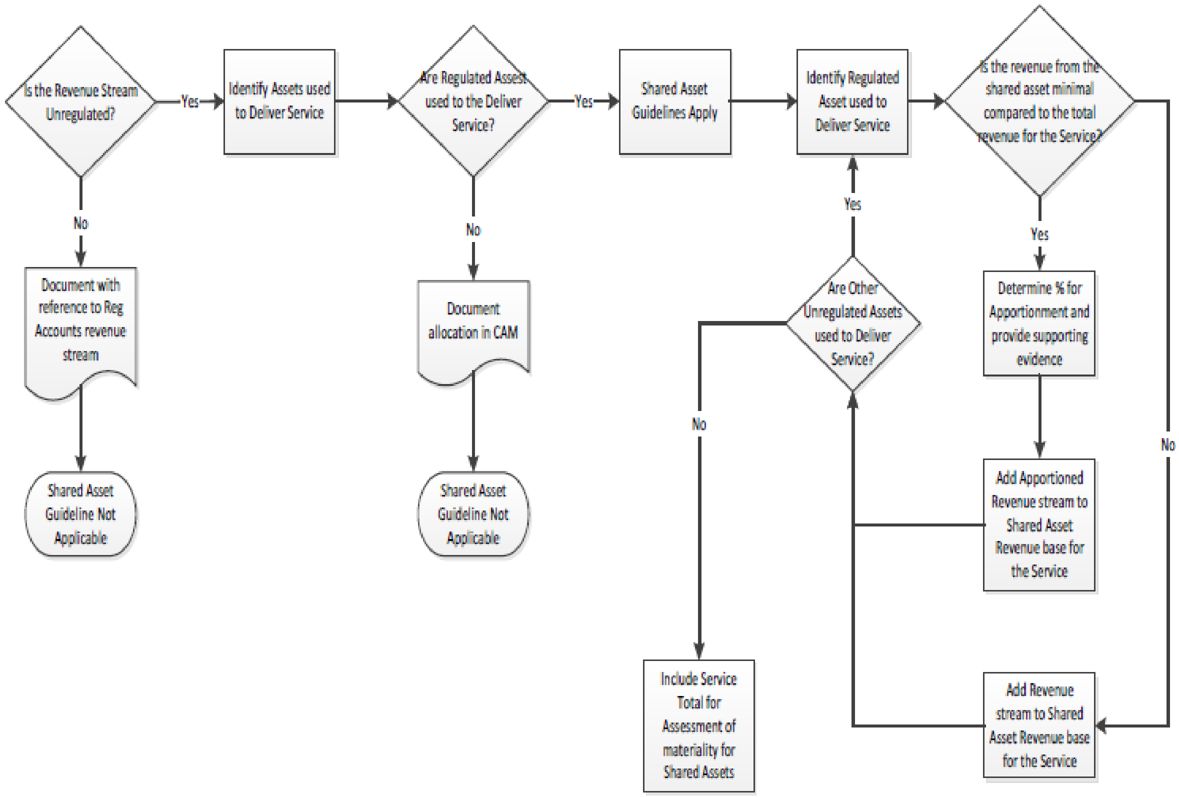
Source of information
Information was obtained from the following sources:

- Data extracts of Non Standard Control revenue transactions from Endeavour Energy's ERP system mapped to Revenue Classifications – Commercial Manager Network and Corporate Services;

- Commercial Manager Network and Corporate Services investigations to identify the assets used to derive Unregulated Revenue stream; and

- Budget and forecast data for Other Revenue was supplied by the Budgeting And Forecasting Manager.

Methodology and assumptions
The flowchart below reflects the decision tree followed to identify and assess Shared Asset revenue streams.



Data Preparation and Identification of Unregulated Revenues
Each Non-Standard Control revenue stream for Actual, Budget and Forecast over the reporting period were mapped to a Regulatory classification using RIN submission working files or mapping information used in RIN submission working files

Request for Information
Requests were made to the Commercial Manager Network and Corporate Services to provide analysis of the revenue streams within their area of responsibility.

Peer Review and Further Investigations
Responses were consolidated by the Commercial Manager Network and Corporate Services and distributed for Peer Review.

The following items were noted for clarification:

- Nightwatch
  As a result of the peer review and subsequent investigations, Nightwatch was identified as a revenue stream that would be classified as Regulated in the coming regulatory period and excluded from the shared asset calculations. Nightwatch had been included in previous submissions when it was an unregulated activity.

- Assumptions
  The following Key Assumptions, in addition to any implications of the above clarifications, have been made in assessing Shared Asset Revenues:

- Revenue Classification:
  Unregulated revenues were identified using the classification applied in the 2016/17 RIN and the results of peer review investigations.

- System Asset Cost Allocation Method (CAM):
  System Assets are fully allocated to Regulated business.

- Non-System Asset CAM:
  The allocation of Non-System assets to the unregulated classification adequately reflects the use of Non-System assets used in the derivation of the unregulated revenue.

- Conclusions on Revenue Streams determined to be Shared Asset Revenues

  As a result of the above process the following revenue streams have been assessed as being derived from the use of Shared Assets:

  - Property Rental (including Radio Base Stations);
  - Columns, Poles and Towers used for mobile phone cells and broadband cable; and
  - Duct used for broadband cable.

- Historical data
  Historical data was extracted from Endeavour Energy’s ERP and mapped consistently with the revenue classification assumption above.

- Forecast data
  Forecast data has been derived using a combination of Endeavour Energy forecasts.

Use of estimated information
No estimations were performed in the preparation of this information as it has been mapped directly from the general ledger.

Reliability of information

This information is believed to be reliable as it is sourced from the general ledger and adheres to the company's accounting policies.

WORKBOOK 2

Final Regulatory Information Notice – 2 – New CA

2.5 CONNECTIONS

2.5.2 COST METRICS BY CONNECTION CLASSIFICATION

Compliance with requirements of the notice
The data provided in this section is based on the core data used to respond to the requirements for template 2.5.1. The data for this template is a restatement of the data provided in the previous template with a focus in this instance on the connection methodology defined in Appendix F.

Source of information
Data has been obtained from a number of internal sources as outlined below:

- Finance and Compliance Division – general ledger, fixed asset register and customer data; and
- Network Connections Branch – Customer connection and NOSW information.

The data included in template 2.5.1 using the above sources has been used to complete the relevant parts of template 2.5.2. For example, the number of simple residential connections included in table 2.5.2 for 2014-2015 is the sum of the OH and UG connections from line numbers 1 and 2 of the Residential category in table 2.5.1.

Methodology and assumptions
The data held by the Company did not align with the data breakout as required by the reporting template. As a result it was necessary to cross match and supplement base data with other actual data available from other Company systems. Where data was not readily available from historical records, required template information was derived from actual data and current information obtained from analysis and review of available information.

The assumptions used in the completion of this template are as follows:

- Residential – All residential connections are simple connections to existing LV infrastructure allowing connection of up to 100 amps single phase or 63 amps three phase;

- Commercial / Industrial – All commercial / industrial connections are complex, customers are connected at LV and there is some upstream network works required;

- Subdivision – All subdivision connections are complex with HV extension to the network to allow connections to be completed at LV to developed infrastructure; and

- Embedded Generation – All embedded generation less than 5kW single phase is a simple connection made to an existing network connection for the residential load at the connected premises.

Endeavour Energy funded works Capital uplift- Forecast
From 2017-2018 onwards the company has decided to uplift capital with HV cables and packaged substation.

<u>Assumption Capital Uplift</u>

<table>
<tr><th></th><th>HV Cables</th><th>Substation</th><th></th></tr>
<tr><td>ULL</td><td></td><td></td><td rowspan="5">Industrial Commercial</td></tr>
<tr><td>UIL</td><td></td><td></td></tr>
<tr><td>UIS</td><td></td><td></td></tr>
<tr><td>UCS</td><td></td><td></td></tr>
<tr><td>UCL</td><td></td><td></td></tr>
<tr><td>UML</td><td></td><td></td><td>Residential</td></tr>
</table>

NRL			
NRS			
URS			**Subdivision**
UMS			

Historical data standard Control – Capital Contribution

The data was sourced from the Non cash capital contribution Asset Register provided by Finance. All assets were included in the basis of the prep including land.

Other noncustomer connection (Asset Relocation and Other) was added into the Industrial Commercial (HV) category as advised by AER due to the considerable amount.

Non Customer connections was categorised as Complex connection HV (customer connected at HV) it include Asset Relocation which has HV cables.

Use of estimated information

The completion of this template has been based on information contained in template 2.5.1. The data used are actual values based on the source data provided by groups listed under the heading “Source of Information”.

Reliability of information

The data used to complete the historical data in the template is based on actual data and has a high level of integrity and reliability.

Information Not Included in the Template

- Residential – The rows for Complex Connection LV and Complex Connection HV, have not been allocated any values for the period;
- Commercial / Industrial – The rows for Simple Connection, Complex Connection HV (Customer Connected at LV, upstream asset works), Complex Connection HV (Customer connected at HV) and Complex Connection Sub – Transmission, have not been allocated any values for the period;
- Subdivision – The rows for Complex Connection, and Complex Connection HV (with upstream asset works), have not been allocated any values for the period; and
- Embedded Generation – The rows for Complex Connection HV (Small Capacity) and Complex Connection HV (Large Capacity), have not been allocated any values for the period.

2.5.3 VOLUMES BY CONNECTION CLASSIFICATION

Compliance with requirements of the notice

The data provided in this section seeks to address the requirements of Schedule 2, Clause 10 and Appendix F of the Regulatory Information Notice. Where the data is readily available, actual data has been used to complete template 2.5.1. In other instances, data has been derived from actual data and for the remainder, data has been estimated / calculated based on a number of known parameters.

Important Note

From 2017-2018 onwards Endeavour Energy has increased its funding of Assets via a capital uplift program. This in turn will see an increase in the Substation and HV cables funding for the future.

Source of information

Data has been obtained from a number of internal sources as outlined below:

- Finance and Compliance Division – general ledger, fixed asset register and customer data;

- Network Connections Branch – Customer connection, NOSW information and SAMP 10 year forecast of lots serviced; and
- Network Connections Expenditure PIP 9 forecast model.

Methodology and assumptions

The data held by the Company did not in all cases align with the data breakout as required by the reporting template. As a result it was necessary to cross match and supplement base data with other actual data available from other Company systems. Where data was not readily available from historical records, required template information was derived / calculated from actual data and current information obtained from analysis and review of available information.

The data used in the completion of the template were as follows:

- Actual customer numbers by class and forward estimate;

- Fixed asset register and general ledger for financial details by class;

- Customer Application Management System (CAMS) for validation of transformer numbers and size;

- Asset Valuation Sheet (AVS) used for the estimation of UG and OH circuit lengths;

- Notification of Service Work (NOSW) Endeavour Energy form number FPJ4503, sample used to determine connection types, customer proportions and connection methodology. The data was collated from the NAAS . This data was used to assist in proportioning the connection types for residential, industrial/ commercial and subdivision and as a subset the embedded generator connections that occur to an existing network connection;

- Developed estimation ratios for each connection class and type to fill template requirements for template 2.5.3;

- Financial Report actuals and forward estimates;

- Strategic Asset Management Plan (SAMP) 10 year financial data;

- SAMP 10 year Lot forecast to determine residential and subdivision customer proportions;

- Network Connections Expenditure PIP 9 forecast model; and

- Non Cash Capital Contribution Asset Register.

Use of estimated information

Endeavour Energy has used estimated information for the following elements of the template:

- The split of OH and UG connections for each of the Connection Subcategories in Template 2.5.1 & 2.5.3;
- The circuit km added to the network for each of the Connection Subcategories in Template 2.5.1;
- An estimate was required for the above reporting elements because actual data was not available from Company records; and
- The basis for the estimates is outlined below:

  a) Determination of customer numbers in Residential and Subdivision categories – The Company has the customer numbers data contained Domestic and Controlled Load customers, however, the customer numbers were not available in the domestic and subdivision categories. To determine the number of customers in each domestic and subdivision category, SAMP 10 year Lot forecast with 2015/2016 actuals was used to develop the proportions for the required categories and then applied the proportion for residential and subdivision customers.

b) Split of OH and UG connections – This estimation was applied to connections in the Residential, Commercial / Industrial and Subdivision categories of template 2.5.1 & 2.5.3. Whilst historical customer data was maintained by the Company in the three major reporting categories it did not naturally break into overhead and underground connections. The Embedded Generation category also needed to be addressed for connection type. A sample from NAAS for Oct 25th 2015 to Jul 2016 was analysed to determine the connection methodology and type of connection being made. For Embedded generation we used a similar sample size as last year from Mar 2016. From this analysis, assumptions were developed and applied to the actual data provided in the customer numbers document. These numbers were then included in the reporting template. The process applied used the year on year customer number change, split the numbers into the required categories and then applied the proportion for the OH and UG connection split.

c) Circuit km added to the network – The Company did not have available the data that would allow the ready completion of the template for these categories for HV and LV connection. Financial data was available from the financial reports, for both overhead and underground connections, however, route length was not available. To derive these lengths, the current Asset Valuation Sheet (AVS) was used to develop typical costs for standard construction types per km for both HV and LV overhead and underground installations. The financial from the AVS data was then used to derive route lengths for each connection type. The 2014/15 AVS data was used to calculate the preceding year's conductor length data as they still related 2015/16 for cable cost.

d) Cost per Lot has been obtained by calculation using the SAMP financial data and the lot numbers included in the SAMP 10 year lot forecast.

- Forecasting data was based on the 3 year average ratio.

Reliability of information

The core data used in the approximation was Company data that had a high level of integrity. The estimation process outlined in (a), (b), (c) and (d) is technically sound and when applied to the core data has produced acceptable results.

The results are then compared against with the forward estimate data provided to AER in Aug 2015 as a basis for verification with the forward estimates. The estimation method is sound and verifiable.

Information Not Included in the Template

The following information has not been included in the template;

- Residential – Mean Days to Connect Residential Customer with LV single phase connection

  The Company does not maintain records of the length of time negotiated or accomplished by a Level 2 Accredited Service Provider in completing the Connection Service arranged with their individual customers. The Company has no involvement in the allocation or monitoring of work completion by Level 2 Accredited Service Providers.

- Embedded Generation – Distribution Substations and Circuit Augmentation

  Small scale embedded generation systems connected to the network are required to first be a retail customer and have an installation which is already connected to the network. As a result load related matters are dealt with during the load connection process. There are no available Company records that indicate that any distribution substations have been added to the network or circuit augmentation required to facilitate the connection of a small scale embedded generator.

  The numbers included in the templates for embedded generator connections are not considered as additional new customers connecting to the network. They therefore are not included in the connection data by Connection Subcategory – Residential, Industrial / Commercial or Subdivision.

The numbers quoted are standalone based on the connection requirements outlined in paragraph 1 of this reporting item.

2.6 NON-NETWORK EXPENDITURE

2.6.4 INFORMATION & COMMUNICATIONS TECHNOLOGY – CAPEX BY PURPOSE

Compliance with requirements of the notice

The data presented in table 2.6.4 is consistent with the definition of Non-network IT and Communications Expenditure per the RIN definition. In particular:

- the data presented in table 2.6.4 reflects IT & Communications capital expenditure. The data is reported by Asset Category in accordance with the RIN definitions;
- the non-network IT & Communications capex listed in table 2.6.4 is all non-network expenditure directly attributable to IT and communications assets including replacement, installation, operation, maintenance, licensing, and leasing costs but excluding all costs associated with SCADA and Network Control Expenditure that exist beyond gateway devices (routers, bridges etc.) at corporate offices; and
- the Capex data presented in table 2.6.4 represents the total capital expenditure including labour, overtime, plant, materials, maintenance, other contractors, professional services and other operating expenses pertaining to all non-network IT & Communications expenditure.

Source of information

The information used to populate the table contained in section 2.6.4 was extracted directly from the following RIN templates:

Year	Data source	Location
2008-09 to 2012-13	2014 Reset RIN Templates	https://www.aer.gov.au/system/files/Endeavour%20Energy%20-%20RIN.1%20-%20NSW_ACT%20Electricity%20DNSPs%20reset%20RIN%20templates%20- %20Consolidated%20information%20%28Public%29%20-%202014.xlsx
2013-14	2014 Category Analysis RIN – Table 2.6	https://www.aer.gov.au/system/files/Endeavour%20Energy%20%28D%29%202013-14%20-%20Category%20Analysis%20RIN%20-%20Templates%20D14%20149366.XLSM
2014-15	2015 Category Analysis RIN – Table 2.6	https://www.aer.gov.au/system/files/Copy%20of%20D15%2017707 0%20%20Endeavour%20Energy%202014-15%20-%20Category%20Analysis%20RIN%20-%20Templates%20-%20CONSOLIDATED%20-%20Att%203%20-%2024%20November%202015%20-%20PUBLIC.xlsm
2015-16	2016 Category Analysis RIN – Table 2.6	https://www.aer.gov.au/system/files/Copy%20of%20D16%2014687 9%28V2%29%20%20Endeavour%20Energy%202015-16%20Category%20Analysis%20RIN%20Response%20-%20Att%203%20-%20Templates%20-%20Consolidated%20-%2031%20October%202016%20-%20PUBLIC.xlsm
2016-17	2017 Category Analysis RIN – Table 2.6	Not yet published to AER website

Methodology and Assumptions

The following table sets out the methodology applied to calculate the required data for the IT and Communications sections in table 2.6.4:

Table	Methodology	Assumptions
2.6.4 (capex)	1. Extract the historical IT capex totals from the audited RIN templates for each respective year. 2. Allocation of Capex actuals by Purpose **a. ICT Capability Growth** The acquisition, development and implementation of new ICT assets to meet a business purpose or capacity requirement. **Includes purchase or build of new solutions.** **b. ICT Asset Extension** The extension of existing ICT assets to broaden its functionality. **Includes all projects to implement new functionality within existing systems.** **c. ICT Asset Remediation** The correction or optimisation of the performance of existing ICT assets that are not performing to the required service performance requirement. **Includes all small projects to extend the life of existing assets.** **d. ICT Asset Replacement** The replacement of an existing ITC asset with its modern equivalent where the asset has reached the end of its economic life. This capex has a primary driver of replacement if the factor determining the expenditure is the existing ICT asset has an inability to efficiently maintain its service performance requirement. **Includes all hardware and systems technical currency projects.**	

Use of estimated information

While Endeavour Energy made an assumption in order to allocate the IT and Communications expenditure into the Categories in the RIN templates, the capex in table 2.6.4 reconciles to the annual RIN (as outlined above), it has not used estimated Information as provided in the definitions with the Regulatory Information Notice.

Reliability of information

All historical information provided represents Actual Information extracted from Endeavour Energy's reporting systems and reconciles to all reported IT and Communications capex figures in the annual RIN however assumptions were made in order to classify the data into Asset Categories. As a result, the information contained in the tables in section 2.6.1 is considered to be reliable.

2.10 OVERHEADS

2.10.1 NETWORK OVERHEADS EXPENDITURE AND 2.10.2 CORPORATE OVERHEADS EXPENDITURE

Compliance with requirements of the notice

The data presented in tables 2.10.1 and 2.10.2 is consistent with the requirements of the Category Analysis RIN. In particular:

- The data presented in table 2.10.1 (Network Overheads expenditure) represents the opex split of network overheads expenditure into Standard Control Services with the definition of network overheads provided in Appendix F of the RIN;

- Endeavour Energy has previously reported *network operating costs* in its Regulatory Accounting Statements, therefore Endeavour Energy have reported this expenditure under the network overhead in regulatory template 2.10.1;

- Endeavour Energy has previously reported *corporate overheads* in its Regulatory Accounting Statements and are not included in any other overhead subcategory, therefore Endeavour Energy have reported this expenditure in regulatory template 2.10.2; and

- The data in tables 2.10.1 and 2.10.2 are overhead costs that are reported before allocation to services or direct expenditure and before any capitalisation. The opex in tables 2.10.1 and 2.10.2 has been categorised and reported in a manner that is consistent with Endeavour Energy's approved Cost Allocation Method and the 2016/17 Annual RIN.

Endeavour Energy capitalises a portion of its overheads which are directly attributable to capital works in order to facilitate the identification of the true cost of activities performed. This enables capitalised projects with enduring economic benefit to be capitalised at their true cost.

Source of information

Financial data is sourced from the Reg Accounts, AER Dollars by Account and AER Totex by Account cubes in 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.

In particular, the AER Totex by Account cube is used by Endeavour Energy to store and report annual opex into the service categories (i.e. Standard Control, Alternate Control and Unregulated categories) at the account code level. It is the primary tool used to allocate opex in accordance with Endeavour Energy's approved Cost Allocation Method.

Methodology and assumptions

Table	Methodology	Assumptions
2.10.1 and 2.10.2	**Years 2008-09 – 2012-13** Extract the data for opex and capex from the last published reset RIN on the AERs website. *https://www.aer.gov.au/system/files/Endeavour%20Energy%20-%20RIN.1%20-%20NSW_ACT%20Electricity%20DNSPs%20reset%20RIN%20templates%20-%20Consolidated%20information%20%28Public%29%20-%202014.xlsx* Unregulated overheads were not reported in any RINs during this period and are therefore sourced from the Reg Accounts cube in TM1 for	

	each respective year. **Years 2013-14 – 2016-17** Extract the data for opex and capex from the last published category RINs on the AERs website for each respective year. Alternate control capital overheads were not reported in any RINs during this period and are therefore sourced from the relevant AER reporting cube in TM1 for each respective year. 2013-14 – Reg Accounts Cube 2014-15 – 2015-16 – AER Dollars By Account Cube 2016-17 – AER Totex By Account Cube	

Use of estimated information

Information reported in table 2.10.1 and 2.10.2 consists of actual information as defined in the RIN Instructions & Definitions.

Reliability of information

Information reported in table 2.10.1 and 2.10.2 consists of Actual Information extracted from Endeavour Energy's reporting systems and reconciles to opex figures calculated and reported in the RINs. As a result, the information contained in table 2.10.1 and 2.10.2 is considered to be reliable.

WORKBOOK 5

Final Regulatory Information Notice – 5 – EBSS

7.5 EBSS

7.5.1 CARRY OVER AMOUNTS FROM 2014-15 TO 2018-19

Compliance with requirements of the notice

The entries in table 7.5.1 capture the carryover amounts that arise from applying the EBSS during the current regulatory control period.

The entries in table 7.5.2 capture the proposed forecast opex for the EBSS for the forthcoming regulatory control period.

Source of information

Table 7.5.1

June CPI Index:

- FY18 and FY19 indexes are forecast based on Endeavour Energy CPI expectations.

EBSS Opex Allowances (7.5.1.1):

- FY13 and FY14 allowances are sourced from the AER's Final EBSS Decision Model (April 2015) for the FY15 to FY19 regulatory period.
- FY15 to FY19 allowances are sourced from the AER's Final Decision Model (April 2015) for the FY15 to FY19 regulatory period.

EBSS Opex Actuals (7.5.1.2):

- FY13 to FY17 actuals are sourced from Endeavour Energy's corresponding Annual RIN (For FY13 & 14 see 'EBSS' worksheet. For FY15 to FY17 see table 8.4.1).
- FY13 to FY14 debt raising adjustments are sourced from Endeavour Energy's corresponding Annual RIN (see 'EBSS' worksheet). There are no values for FY15 to FY18.
- FY13 to FY14 self-insurance adjustments have been set to zero as per AER consultation. There are no values for FY15 to FY18.
- FY13 to FY14 insurance adjustments have been set to zero as per AER consultation. There are no values for FY15 to FY18.
- FY13 to FY14 superannuation adjustments have been set to zero as per AER consultation. There are no values for FY15 to FY18.
- FY13 to FY17 non-network alternative adjustments are sourced from Endeavour Energy's corresponding Annual RIN (see 'DMIS-DMIA' worksheet). There is no value for FY18.
- FY13 to FY14 capitalisation policy change adjustments have been sourced from the corresponding Annual RIN (see 'EBSS' worksheet). There are no values for FY15 to FY18.
- FY13 movements in provisions related to opex are sourced from AER consultation. FY14 to FY17 values are sourced from Endeavour Energy's corresponding Economic Benchmarking RIN (see 'Provisions' worksheet). There is no value for FY18.
- FY13 to FY14 other exclusion adjustments have been sourced from the corresponding Annual RIN (see 'EBSS' worksheet). There are no values for FY15 to FY18.
- FY15 to FY18 Legal Costs for the 2015 Appeals Process are sourced Endeavour Energy's General Ledger.

EBSS Opex Forecast:

- The FY18 EBSS opex forecast is sourced from Endeavour Energy's FY18 budget.

Table 7.5.2

Opex Forecast:

- The FY20 to FY24 Opex forecast is sourced from the AER's Opex Model, as prepared by Endeavour Energy in support of the 2019 Regulatory Submission.

Debt Raising Cost Forecast:

- The FY20 to FY24 Debt Raising Cost forecast is calculated internally within the AER's PTRM, as prepared by Endeavour Energy in support of the 2019 Regulatory Submission.

Methodology and assumptions

See source of information above.

Use of estimated information

Legal Costs for the 2015 Appeals Process paid in FY15 and FY16 were paid by Essential Energy and recharged Endeavour Energy via the Networks NSW group recharge function. These amounts cannot be split between the two years so the average standard control services proportion over the two years has been applied to the total cost.

Material accounting policy changes

Not applicable.

Reliability of information

The information used to populate Attachment 7 (EBSS) tables 7.5.1 and 7.5.2 is considered to be reliable:

- Allowance data is sourced from published AER Decision models;
- Actual data is sourced from audited RIN submissions; and
- Forecast data is prepared by Endeavour Energy in support of the 2019 Regulatory Submission.

WORKBOOK 6

Final Regulatory Information Notice – 6 – CESS

CAPITAL EXPENDITURE SHARING SCHEME

FORECAST CAPEX FOR CESS PURPOSES (CESS TARGET) AND ACTUAL/ESTIMATED CAPEX FOR CESS PURPOSES

Compliance with requirements of the notice

The entries in table 1 capture the capex allowance for CESS purposes during the current regulatory control period (FY15 to FY19).

The entries in table 2 capture the actual and forecast capex CESS purposes during the current regulatory control period.

Source of information

Table 1: CESS Capex Allowances:
FY15 to FY19 allowances are sourced from the AER's Final Decision Model (April 2015) for the FY15 to FY19 regulatory period.

Table 2: CESS Capex Actuals:
FY15 to FY17 actuals are sourced from Endeavour Energy's corresponding Annual RIN (Tables 8.2.4 & 8.2.6).

FY15 to FY17 movements in provisions related to capex are sourced from Endeavour Energy's corresponding Economic Benchmarking RIN (see 'Provisions' worksheet). There are no values for FY18 to FY19.

Table 2: CESS Capex Forecast:
The FY18 and FY19 CESS capex forecast is sourced from Endeavour Energy's internal budget.

Methodology and assumptions

FY15 to FY17 actuals are sourced from Endeavour Energy's corresponding Annual RIN and are calculated as Capex (Table 8.2.4) less Disposals (Table 8.2.6).

Use of estimated information

Not applicable.

Material accounting policy changes

Not applicable.

Reliability of information

The information used to populate Attachment 8 (CESS) tables 1 and 2 is considered to be reliable:

- Allowance data is sourced from published AER Decision models;
- Actual data is sourced from audited RIN submissions; and
- Forecast data is prepared by Endeavour Energy in support of the 2019 Regulatory Submission.

SCHEDULE 1

SCHEDULE 1

1.3 For all information, other than forecast information, provide in accordance with this notice and the instructions in Appendix E, a basis of preparation demonstrating how Endeavour Energy has complied with this notice in respect of:

(a) the information in each regulatory template in the Microsoft Excel Workbooks attached at Appendix A; and

(b) any other information prepared in accordance with the requirements of this notice:

- **(i) paragraph 1.2**

Not applicable.

- **(ii) paragraph 5.1(a)(ii)**

Compliance with requirements of the notice
Information has been provided in accordance with paragraph 5.1 (a) (ii).

Source of information
The figures used to determine the proportion of Endeavour Energy's current repex which is attributed to asset condition, safety risks and reliability drivers discussed in questions 5.1 (a) (ii) (A) and 5.1 (a) (ii) (B) are sums of the actual and forecast expenditure in the current RCP for specific renewal programs included in Endeavour Energy's Portfolio Investment Plan.

Programs TS173 and TS700 contribute to the "switchgear" asset group whilst TS177 is unmodelled.
Details included in the business cases for each of the programs noted were taken into account in assessing each of these programs as having drivers for renewal other than asset condition.

Methodology and assumptions
The drivers for renewal programs in the current RCP were determined as noted above. 100% of the actual and forecast expenditure on programs TS173 and TS700 has been attributed to "safety" rather than asset condition and 100% of the actual and forecast expenditure on program TS177 has been attributed to reliability rather than asset condition. Together the expenditure on these three programs accounts for $18.3M or 3.0% of the $615M actual/forecast expenditure in the current RCP leaving 97% of the renewal expenditure attributed to asset condition.

Use of estimated information
The forecast expenditure for the next RCP, used to address questions 5.1 ii (A) and (B), is based principally on asset condition based needs and where that data is not available, the forecast is based on modelling.

The figure for the proportion of asset replacements due to augmentation works is an estimate only but has no impact as it is excluded from the repex proposal.

Reliability of information
The reliability of the estimated information is considered to be sound as it is based on Endeavour Energy's business as usual practices including asset need assessment and on our renewal modelling experience, as noted in our repex proposal.

- **(iii) paragraph 8.5**

  Not applicable.

- **(iv) paragraph 13 (13.5 and 13.6)**

  Compliance with requirements of the notice
  The information provided in response to these Schedule 1 questions is based on the core information used to develop Endeavour Energy's public lighting, ancillary network and metering prices for the 2019-24 period in accordance with the price cap control mechanism.

  Source of information
  Historical information has been sourced from previously submitted RINs and the AER's final determination metering and ancillary network pricing models.

  Forecast revenue and prices have been developed using the following information:

  - Ancillary services:
    - labour rates: 2014-19 AER determination escalated accordingly:
    - CPI: as per CPI index provided in the Reset RIN and as per standard control services PTRM for forecast years;
    - X-factors: as per the AER's 2014-19 determination;
    - timing assumptions: as per AER's 2014-19 determination;
    - overheads: the AER provided labour rates in the 2014-19 determination that included (implicitly) overheads. The "overhead" factor in our 2014-19 models were used for the addition of overtime in a select few services. We have maintained the 2014-19 determination labour rates and therefore not 'split' out the overhead portion. Although the model provides the functionality to if required;
    - materials: as per AER's 2014-19 determination;
    - new ANS services: for new ancillary services we have selected labour rates and timing assumptions based on similar services and our detailed knowledge of the activities involved. Security lighting (Nightwatch) is discussed separately; and
    - WACC: as per standard control services PTRM.
  - Metering:
    - opex: Energeia estimate based on benchmarking analysis and base-step-trend methodology;
    - capex: planning and metering branch forecast;
    - volumes/customers: Energeia estimate;
    - WACC: as per standard control services PTRM; and
    - CPI: as per CPI index provided in the Reset RIN and as per standard control services PTRM for forecast years.
  - Public lighting:
    - opex: FY18 base year forecast for public lighting service, labour cost escalations as per the labour cost escalation rates for standard control services;

  - capex unit rates: Current market sourced acquisition costs and FY18 capitalised labour;
  - WACC: as per standard control services PTRM;
  - pre-2009 asset opening RAB: as per roll forward of the AER's 2014-19 determination;
  - services : based on technology types as per the AER's 2014-19 determination plus new market available technologies; and
  - CPI: as per CPI index provided in the Reset RIN and as per standard control services PTRM for forecast years.
- Security Lighting (Nightwatch):
  - opex: FY18 base year forecast for Nightwatch service, labour cost escalations as per the labour cost escalation rates for standard control services;
  - capex unit rates: Current market sourced acquisition costs and FY18 capitalised labour;
  - WACC: as per standard control services PTRM;
  - services: based on illumination output types, analogous to existing technology types installed; and
  - CPI: as per CPI index provided in the Reset RIN and as per standard control services PTRM for forecast years.

For labour rates the 2014-19 determination rates have been used (and escalated) for ancillary services. For metering, a base-step-trend method has been used to develop the opex forecast rather than a labour rate basis that is more suited to fee and quote based services.

Methodology and assumptions

For all historical information refer to the Basis of Preparation for previous RINs. For forecast information:

- Ancillary services:
  - revenue: the 'overview' worksheet of Endeavour Energy – 14.10 ANS Pricing Models – April 2018 – Public provides an explanation of how the model develops prices (and in doing so revenue forecasts);
  - labour rates: detailed workings and labour classifications were provided in support of our 2014-19 submission. Overall 19 unique labour rates were used in developing our proposed ANS prices. The AER amended these labour rates using benchmarking analysis provided by a Consultant. As we have used the AER approved labour rates for the 2019-24 period we do not have a detailed breakdown of them; and
  - materials: as per the above.
- Metering:
  - revenue: The 'overview' worksheet in Endeavour Energy – 14.06 Metering Pricing Model – November 2017 – Public explains how the metering pricing model functions. To summarise it replicates the functionality of the AER's PTRM and RFM models used for standard control services;

  - labour rates: metering is not priced and a fee or quote basis like ancillary services meaning a bottom up cost build up (primarily consisting of labour) has not been used to set prices. Instead, a building blocks approach has been used meaning we have used a base-step-trend method to develop our metering opex forecast as detailed in Endeavour Energy - Energeia - 14.01 Metering - Cost Report - November 2017 – Public; and

  - materials: following Power of Choice reforms the only material costs relate to testing equipment which have been forecast based on historical costs.

- Public Lighting:
  - revenue: The development of the detailed pricing for pre-2009 RAB based assets and post 2009 annuity based pricing is set out in the pricing model, Endeavour Energy – 14.09 Public Lighting Pricing Model – March 2018 – Public. The framework for establishing pricing is consistent with that adopted over the previous two regulatory periods. To develop revenue forecasts these unit rates are applied to current asset populations as per our billing records and then escalated by the regulatory CPI annually thereafter;

  - labour rates: public lighting is a broad grouping of individual activities and is not priced using a bottom up build for each component and component type within an installation. Instead, a building blocks approach has been used meaning we have used a base-step-trend method for the public lighting line of business to develop our public lighting opex forecast; and

  - materials: The cost of materials is as per our current negotiated costs with our suppliers. No real cost escalation or change has been assumed in our modelling for materials.

- Security Lighting (Nightwatch):
  - revenue: Nightwatch revenues have been developed using the annuity pricing approach contained in the public lighting model and can be found at Endeavour Energy – 14.10 ANS Pricing Models – April 2018 – Public. Importantly however Endeavour Energy has pegged its revenues on our pre-existing negotiated site specific prices with end customers acknowledging that these contracts have been completed as an unregulated service. Revenues have been escalated at the assumed regulatory CPI;

  - labour rates: Security lighting is a grouping of individual activities and is not priced using a bottom up build for each type of installation. Instead, a building blocks approach has been used meaning we have used a base-step-trend method for the Security Lighting line of business to develop our public lighting opex forecast, noting that as a previously unregulated service, its costs have been quarantined and allocated to the specific service; and

  - materials: The cost of materials is as per our current negotiated costs with our suppliers. No real cost escalation or change has been assumed in our modelling for materials.

Use of estimated information

No estimated information has been used in preparing historical data. All forecast information is estimated.

Reliability of information
The forecast information represents our best estimate based on expert advice and historical information.

- **(v) paragraph 15 (15.2 and 15.3)**

Compliance with requirements of the notice
The information provided in response to these Schedule 1 questions is based on the core information used to develop Endeavour Energy's metering prices for the 2019-24 period in accordance with the price cap control mechanism.

Source of information
Historical information was derived from previously reported metering data from the 2014-15 to 2016-17 RINs and the AER's 2014-19 final determination. The metering model, Attachment 14.06 Metering Pricing Model – November 2017 – Public, contains the allowed x-factors and resulting prices for the 2014-19 period that were allowed by the AER. This has been updated with actual metering data reported in the RIN over the period.

Forecast capex has been provided by our Network Planning and Metering teams, focusing solely on the metering testing given the Power of Choice reforms. Forecast opex were provided by Energeia using a benchmark model and historical data as detailed in Endeavour Energy – Energeia – 14.02 Metering – Cost of Service Model – November 2017 – Confidential. Forecast volumes were also provided by Energeia as detailed in Endeavour Energy – Energeia – 14.04 Metering – Volumes Model – November 2017 – Confidential.

Methodology and assumptions
For all historic information the methodology and assumptions are as per the Basis of Preparation provided with historical RINs.

For forecast information provided in response to each of the questions in Schedule 1 the methodology and assumptions are as follows:

- a description of the services: The metering services covered in the model are as defined and described in the AER's 2019-24 F&A paper;

- labour costs and overheads: As per the Basis of Preparation for templates 4.2 and 2.10. In terms of specific labour class descriptions a base-step-trend method has been used to develop the metering opex forecast, as described in Endeavour Energy - Energeia - 14.01 Metering - Cost Report - November 2017 – Public;

- volumes/customer numbers: the methodology and assumptions used to develop the volume estimates is addressed in Endeavour Energy - Energeia - 14.01 Metering - Cost Report - November 2017 – Public and Endeavour Energy – Energeia – 14.04 Metering – Volumes Model – November 2017 – Confidential;

- charge per service: The 'overview' worksheet in Endeavour Energy – 14.06 Metering Pricing Model – November 2017 – Public explains how the metering pricing model functions. To summarise it replicates the functionality of the AER's PTRM and RFM models used for standard control services; and

- Revenue earned: as above.

Use of estimated information
No estimated information has been used in preparing historical data. All forecast information is estimated.

Reliability of information
The forecast information represents our best estimate based on expert advice and historical information.

- **(vi) paragraph 16 (16.2-16.7, 16.10)**

PARAGRAPH 16.2
Compliance with requirements of the notice
The data provided has been reported for the current regulatory control period and forecast for the forthcoming regulatory period and complies with the requirement of the notice.

Source of information
The information is received from Procurement Section of Endeavour Energy for current and past years. The data was 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 program. COGNOS extracts this data from Ellipse (the organisations asset management database).

Methodology and assumptions
Usage
Actual figures are used for the years 2015/16 and 2016/17.

For the 2017/18 (current year) the item forecast is until May 2018, which is 11 months of the 2017/18 FNY. The average of these 11 months is taken to work out the forecasted usage for the final month of June 2018. Forecast 11 months and pro rata for the 12th month is added to arrive at the forecast usage for the full year 2017/18. Future years are arrived at by averaging the years 2015/16, 2016/17 and 2017/18 and applying a 1.9% growth. The growth rate of 1.9% is arrived at by considering the growth in luminaires from 30th June 2006 (166,479) to 30th June 2017 (204,651) thus arriving at an average compounded growth of 1.9% per annum. This growth is applied to future years after 2017-18.

Price
The present financial year price is considered for the year 2017/18. For future years an increase of 2.5% each year is applied. The figure of 2.5% is the anticipated CPI increase in future years.

Use of estimated information
All historical data for the previous two years (2015-16 and 2016-17) is based on actuals. Forecasted data is based on the information provided above under Methodology and assumptions.

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

PARAGRAPH 16.3
Compliance with requirements of the notice
The data provided is consistent with the requirements. Assumptions, if any, are explained below.

Source of information
The information is based on manufacturer / supplier's catalogue, test reports and Endeavour Energy's past experience.

Methodology and assumptions

LED Luminaires

The data is considered from the LM 80 Test Report provided by the manufacturer / supplier.

Non LED luminaires

The data is based on the information provided by the manufacturer/supplier.

Use of estimated information

Non-led luminaires (High Intensity Discharge lamps and Fluorescent lamps) have a life expectancy of 20 years assuming that they are maintained during those 20 years (lamp holder & gear replacement). This is based on the current accessibility of the components to maintain these luminaires. There is a major concern regarding future availability of the various components to allow maintenance of HID and Fluorescent luminaires. As LED takes more of a foothold in the market, manufactures will not have the economies of scale to make the components for HID and CFL luminaires. This may result in the supplier's decision not to make certain components which could result in earlier than expected retirement of HID and CLF luminaires in subsequent years.

Reliability of information

The test reports from manufacturers and suppliers from accredited test houses are considered reliable.

PARAGRAPH 16.4 AND 16.5

Compliance with requirements of the notice

The data provided is consistent with the requirement.

Source of information

The information is based on Endeavour Energy's project compete where the most optimum Bulk Lamp Replacement was approved by the management.

Methodology and assumptions

The Bulk Lamp Replacement cycles and their likely expense were considered for the following cycles: 2.5 years, 3 years, 3.5 years and 4 years for all lamps and also a **hybrid cycle** of 3 years for all lamps except HPS150W and 250W where 4 years was considered. Techno-commercially the hybrid cycle returned the best figures and short listed. Lamp life expectancy and survival rates were taken from the present supplier's catalogue.

Use of estimated information

All information is based on technical information available from the manufacturer and the past experience of Endeavour energy. No estimation was necessary.

Reliability of information

The supplier's life expectancy data for lamps is considered reliable. The figures are matched with other manufacturers to ensure that they are in line with the industry.

PARAGRAPH 16.6

Compliance with requirements of the notice

The data provided for the number of luminaires by type under RIN1.20 Public Lighting Luminaires has been reported as of 30th June 2017 to represent the current year (2016/17). The light types are broken down into individual light types (Mercury, Compact Fluorescent, T5 etc.) and wattages of each light type in use. The information submitted is in line with the requirement of the notice.

Source of information

The number of luminaires under "Current Population of Lights" is extracted from the June 2017 Street Lighting Usage of System (SLUoS) report of the financial year 2016/17.

Methodology and assumptions

SLUoS reports are prepared by Network Revenue Analyst, Commercial & Decision Support, Endeavour Energy, every month. The report for the month ending June 2017 was used to extract the data for 30th June 2017. The data for the assets installed and energised during the month of June 2017 are appropriated as the number of days in service in June 2017 times the asset/s installed in June 2017 divided by 30 (the total number of days in June 2017). Example: If 10 luminaires are installed in June 2017 for 27 days then the luminaire count for June 2017 will be 10X27/30=9. This methodology applies only for June 2017 as all other months have 100% active days.

Use of estimated information

Data from the SLUoS report is applied. All data on public lighting assets is held in the street lighting equipment register in the company's Ellipse database. This includes all constructed, energised and proposed new assets. This data is the basis for generating Street Lighting Use of System (SLUoS) customer bills. No estimations were necessary.

Reliability of information

SLUoS reports are considered reliable. They are based on information available in Ellipse which is Endeavour Energy's main source of asset / financial data. Historical data is frequently applied for budgeting and forecasting.

PARAGRAPH 16.7

Compliance with requirements of the notice

The data provided has been reported for the current regulatory control period and forecast for the forthcoming regulatory period and complies with the requirement of the notice.

Source of information

The information is received from Procurement Section of Endeavour Energy for current and past years. The data was 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 program. COGNOS extracts this data from Ellipse (the organisations asset management database).

Methodology and assumptions

Usage

Actual figures are used for the years 2015/16 and 2016/17.

For the 2017/18 (current year) the item forecast is until May 2018, which is 11 months of the 2017/18 FNY. The average of these 11 months is taken to work out the forecasted usage for the final month of June 2018. Forecast 11 months and pro rata for the 12th month is added to arrive at the forecast usage for the full year 2017/18. Future years are arrived at by averaging the years 2015/16, 2016/17 and 2017/18 and applying a 1.9% growth. The growth rate of 1.9% is arrived at by considering the growth in luminaires from 30th June 2006 (166,479) to 30th June 2017 (204,651) thus arriving at an average compounded growth of 1.9% per annum. This growth is applied to future years after 2017-18.

Price

The present financial year price is considered for the year 2017/18. For future years an increase of 2.5% each year is applied. The figure of 2.5% is the anticipated CPI increase in future years.

Use of estimated information

All historical data for the previous two years (2015-16 and 2016-17) is based on actuals. Forecasted data is based on the information provided above under Methodology and assumptions.

Reliability of information

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

PARAGRAPH 16.10

Compliance with requirements of the notice

The data provided is consistent with the requirement.

Source of information

The information is received from the Billing and B2B section of Endeavour Energy.

Methodology and assumptions

The information was concise and accurate. No assumptions were necessary.

Use of estimated information

Information from actual billing every month is extracted.

Reliability of information

The information received from Billing and B2B section of Endeavour Energy is considered reliable and accurate and is based on the actual number of invoices generated each month.

GLOSSARY

TERM	DEFINITION
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AMI	Advanced Metering Infrastructure
Building Block Proposal	Per the Transitional Rules
CAPEX	Capital Expenditure
CEG	Competition Economists Group
COAG	Council of Australian Governments
CPI	Consumer Price Index
DLFs	Distribution loss factors
DM	Demand management
DM Code	NSW Code of Practice – Demand Management for Electricity Distributors, May 2004
DMIS	Demand management incentive schemes for the ACT and NSW 2009 distribution determinations
DMP	Demand management plan
DNSP	Distribution network service provider
DRP	Debt risk premium
DWE	Department of Water and Energy
DWP	Distribution network status report and associated distribution works program
EBSS	Efficiency benefit sharing scheme
GDP	Gross Domestic Product
GIS	Geographic information system
GWh	Gigawatt Hour
ICT	Information and Communications Technology
IPART	Independent Pricing and Regulatory Tribunal of NSW

TERM	DEFINITION
ISSC	NSW Industry Safety Steering Committee
kV	Kilovolt
kVA	Kilovolt Ampere
kWh	Kilowatt Hour
Luminaire	An apparatus that distributes, filters or transforms the light transmitted from one or more public lighting lamp and includes, other than the lamps themselves, all the parts necessary for fixing and protecting the lamps and where necessary circuit auxiliaries together with the means for connecting them to the distribution system.
MAR	Maximum allowable revenue
MCE	Ministerial Council of Energy
MRP	Market risk premium
MWh	Megawatt Hour
NEL	National Electricity Law
New Conns	New connections table
NPV	Net present value
NSW	New South Wales
NSW DRP Licence Conditions	The NSW DRP Licence Conditions for the design planning and reliability performance introduced on 1 August 2005 and as amended on 1 December 2007
ODRC	Optimised depreciated replacement cost
OMS	Outage management system
Pass through event	Per the Transitional Rules
PoE	Probability of Exceedance
PTRM	Post tax revenue model
RAB	Regulatory asset base
RCBM	Risk and condition based maintenance approach
2014 regulatory control period	The regulatory period 1 July 2014 to 30 June 2019
Regulatory proposal	Per the Transitional Rules

TERM	DEFINITION
RFP	Request for proposal
RIN	Regulatory Information Notice
RIS	Regulatory Impact Statement
RoLR	Retailer of Last Resort
Rules	National Electricity Rules
RWP	Reliability works program
SAIDI	System average interruption duration index
SAIFI	System average interruption frequency index
SAMP	Strategic Asset Management Plan
SARP	Strategic Asset Renewal Plan
SME	Small Medium Enterprises
SNMP	Strategic network maintenance plan
STPIS	Service target performance incentive scheme
TNPR	Transmission network planning review
ToR	Terms of Reference
TS	Transmission Substation
TUOS	Transmission Use of System
WACC	Weighted Average Cost of Capital
WAPC	Weighted Average Price Cap
WARL	Weighted Average Remaining Life
ZS	Zone Substation

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