



Basis of Preparation

Endeavour Energy

Response to AER - Economic Benchmarking RIN

Submission date: 31 October 2016

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Purpose

The Economic Benchmarking RIN (RIN) requires Endeavour Energy to prepare a Basis of Preparation. By this, the AER mean that for every 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 Economic Benchmarking RIN required to be submitted to the AER by 31 October 2016.

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 Notice.

To do this, the AER recommended that Endeavour Energy structures its Basis of Preparation with a separate section to match each of the worksheets titled '3.1 Revenue' to '3.7.3 Service area factors' in the templates.

The AER noted that Endeavour Energy may consider structuring these sections with subheadings for each subject matter table in each worksheet. For example, for the worksheet '3.4 Operational data', Endeavour Energy would explain its Basis of Preparation for the variables under the heading '3.4.1 Energy delivery', '3.4.2 Customer numbers' and '3.4.3 System demand'. Endeavour Energy's Basis of Preparation has followed this recommended structure.

Endeavour Energy must include in its Basis of Preparation, any other information Endeavour Energy prepares in accordance with the requirements of the Notice (including this document). For example, if Endeavour Energy chooses to disaggregate its RAB using its own approach in addition to the AER's standard approach, Endeavour Energy must explain this in its Basis of Preparation.

The AER has set out what must be in the Basis of Preparation. This is set out 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; (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.
5	For variables that contain financial information (actual or estimated) the relevant Basis of Preparation must explain if accounting policies adopted by Endeavour Energy have materially changed during any of the Regulatory Years covered by the Notice: (i) the nature of the change; and (ii) the impact of the change on the information provided in response to the Notice.

Endeavour Energy may provide additional detail beyond the minimum requirements if Endeavour Energy considers it may assist a user to gain an understanding of the information presented in the templates.

In relation to providing an audit opinion or making an attestation report on the templates presented by Endeavour Energy, an auditor or assurance practitioner shall provide an opinion or attest by reference to Endeavour Energy's Basis of Preparation.

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 and note issues relating to data quality.
- We set out our response to worksheets 3.1 to 3.7, in accordance with the AER's instructions. We note that Worksheet 1 requires no input material.

General approach

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

A key concern of Endeavour Energy is that the AER may use information which is of a poor quality to make regulatory determinations. We note that this issue has been raised with the AER in consultations relating to this notice.

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 in house 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 uses this Oracle database system for all reliability reporting. 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. This system is used to identify and register an event such as a plane strike on the network;
- Outage Management System - Endeavour Energy uses this system to log outages on its network, with the point of contact being from external sources. This system can also be used to identify events where these are externally identified;
- 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 Economic Benchmarking RIN, we have raised significant concerns with providing historical data in the form required by the AER.

Approach to our obligations under the NEL

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

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

Despite this Endeavour Energy has prepared and included the estimated data on an unaudited basis.

Recognition by AER that ‘best estimates’ are not robust

The AER has acknowledged that if we are compelled to provide best estimates then there is potential for the data to lack robustness.

Reliability of applying data to economic benchmarking

We consider that the application of economic benchmarking to guide regulatory decision making would result in error, leading to outcomes that are detrimental to the long term interests of customers. Our view is based on the following reasons:

- As noted in the sections on data quality, there is recognition by the AER that data quality from best estimates will not be of a robust quality, and may not pass audit and reviews. This document identifies where material has been developed from best estimates and the confidence we have in that data. We note in this respect that models such as Total Factor Productivity (TFP) are based on the interaction of multi-variables. If a data series is inaccurate, it can significantly alter the findings of the model and lead to misleading conclusions.
- We are not convinced that economic benchmarking tools such as TFP can be used to infer relative efficiency of DNSPs over time. We consider that the models cannot adequately normalise for differences between DNSPs, and do not provide meaningful assessment of the apparent differences in productivity levels. For example, TFP will show that a firm that replaces ageing assets has declining levels of capital productivity, as the model would show higher prices for capital while maintaining existing service levels. In our view this would be driven by the age of the asset base which is likely to vary between DNSPs.
- We consider that economic benchmarking models such as TFP do not provide the AER with guidance on how to target its review of expenditure forecasts, as the information provided is at too high a level to identify potential areas of efficiency. The models and data collected will not provide any guidance on the underlying drivers of apparent productivity, and therefore does not provide useful analysis on which areas to review in a DNSP's capex and opex forecasts.

Worksheet 3.1 – Revenue

3.1.1 Revenue grouping by chargeable quantity

3.1.2 Revenue grouping by customer type or class

Compliance with requirements of the notice

The data presented in tables 3.1.1 and 3.1.2 is consistent with the requirements of the Economic Benchmarking RIN. In particular:

- Total revenue reported in tables 3.1.1 and 3.1.2 is equal and reconciles to revenue reported in the Annual RIN. Specifically, total Standard Control Services revenue reconciles to the distribution revenue as reported in the Annual RIN. In addition, total Alternative Control Services revenue reconciles to the total of revenue from maintenance of Public Lighting Maintenance, Metering Services and Ancillary Network Services as reported in the Annual RIN;
- Revenue from unmetered supplies is identical in tables 3.1.1 and 3.1.2;
- Revenue presented in table 3.1.1 reflects revenue earned by chargeable quantity in accordance with the category breakdowns as per the definitions provided in chapter 9 of the Economic Benchmarking RIN Instructions and Definitions. Revenue categories DREV0101 to DREV0109 in table 3.1.1 reflect Distribution-Use-Of-System ('DUoS') revenue earned from customers by chargeable quantity. "Revenue from Other Sources" (DREV0113) reflects Ancillary Network Services revenue reported in the Annual RIN; and
- Revenue presented in table 3.1.2 reflects revenue earned by customer type or class in accordance with the category breakdowns as per the definitions provided in chapter 9 of the Economic Benchmarking RIN Instructions and Definitions. "Revenue from Other Customers" (DREV0206) reflects all Alternate Control Services revenue (i.e. total of revenues from Public Lighting Maintenance, Metering Services and Ancillary Network Services), whereas all other categories in table 3.1.2 reflect DUoS revenue earned from customers by customer type or class.

Source of information

DUoS revenue information (DREV0101 to DREV0109 in table 3.1.1 and DREV0201 to DREV0205 in table 3.1.2) used to populate the tables contained in section 3.1 was extracted directly from TM1. Endeavour Energy uses this OLAP tool for various purposes including budgeting and forecasting, monthly reporting and regulatory account allocations and it has been used historically to provide data for previous audited RINs. It is a cube based technology which allows rules to be created between cubes and within cubes. More specifically, DUoS revenue information was extracted from the TM1 NUoS cube which is used by Endeavour Energy to store, analyse and report data related to energy volumes, customer numbers and demand KW/kVA and calculate associated revenue outcomes (i.e. energy revenue, NAC revenue and demand revenue) at the network tariff level. It is the primary tool used to calculate the month end revenue accrual and report on month end results and is also used extensively for budgeting and forecasting revenue related items.

Non-DUoS revenue information (DREV0110 to DREV0113 in table 3.1.1 and DREV0206 in table 3.1.2) was extracted directly from the Annual RIN.

Methodology and Assumptions

The following table sets out the methodology applied to obtain required data for each of the tables in section 3.1.

Table	Methodology	Assumptions
3.1.1 & 3.1.2 DUoS Revenue	<p>1. DUoS revenue data was extracted from the TM1 NUoS cube by network tariff and by revenue type (i.e. NAC revenue, demand revenue and peak, shoulder, off-peak and Non TOU energy revenue).</p> <p>2. Total DUoS revenue derived at the individual network tariff level was reconciled to the total from the TM1 NUoS cube to ensure no network tariffs were excluded.</p> <p>3. Total DUoS revenue from TM1 was reconciled to DUoS revenue reported in the Annual RIN. Material variances (greater than 1%) were investigated and resolved and adjustments made where required. The variances between DUoS revenue in TM1 and DUoS revenue as reported in the Annual RIN was added to 'Revenue from Energy Delivery charges where time of use is not a determinant' (DREV0102) in table 3.1.1 and 'Revenue from residential Customers' (DREV0201) in table 3.1.2 to ensure total DUoS revenue reconciled to the Annual RIN.</p> <p>4. DUoS revenue line items in table 3.1.1 (DREV0101 to DREV0109) and table 3.1.2 (DREV0201 to DREV0205) were populated from the detailed TM1 NUoS cube data in accordance with the Benchmarking RIN Instructions & Definitions.</p> <p><i>Note: Given TM1 NUoS cube data is available and represents information reported to management, all information provided for DUoS revenue consists of Actual Information (no Estimated Information required).</i></p>	<p>The immaterial variance between DUoS revenue in TM1 and DUoS revenue as reported in the Annual RIN was added to 'Revenue from Energy Delivery charges where time of use is not a determinant' (DREV0102) in table 3.1.1 and 'Revenue from residential Customers' (DREV0201) in table 3.1.2 to ensure total DUoS revenue reconciled to the Annual RIN.</p>
3.1.1 & 3.1.2 Non-DUoS Revenue	<p>1. For the purposes of table 3.1.1, Revenue from Metering Services, Public Lighting Maintenance and Ancillary Network Services (ANS) were identified from the Annual RIN and reported in DREV0110, DREV0112 and DREV0113 respectively under Alternative Control Services revenue.</p> <p>2. For the purposes of table 3.1.2, 'Revenue from other customers' (DREV0206) represents the sum of all non-DUoS revenue (DREV0110 to DREV0113) from table 3.1.1.</p> <p><i>Note: Given the non-DUoS revenue data represents previously reported figures, all information provided for non-DUoS revenue consists of Actual Information (no Estimated Information required).</i></p>	<p>None.</p>

Use of estimated information

While Endeavour Energy made an assumption in order to ensure total DUoS revenue reported in table 3.1.1 and 3.1.2 reconciled to DUoS revenue reported in the Annual RIN (as outlined above), it has not used Estimated Information as defined in chapter 9 of the Economic Benchmarking RIN Instructions & Definitions.

Material accounting policy changes

Endeavour Energy have not undertaken any material changes in accounting policies which would impact the data contained in tables 3.1.1 and 3.1.2.

Reliability of information

All the information provided represents Actual Information extracted from Endeavour Energy's reporting systems and has been reconciled to figures reported in the Annual RIN. As a result, the information contained in tables 3.1.1 and 3.1.2 is considered to be reliable.

3.1.3 Revenue (penalties) allowed (deducted) through incentive schemes

Compliance with requirements of the notice

The entries in table 3.1.3 capture the annual revenue adjustments that have resulted from a performance based incentive scheme.

The values reflect the year in which the reward or penalty is applied to revenue, not the year in which they are earned.

Endeavour Energy has included D-Factor allowances under “Other” as annual revenue adjustments are made under this scheme based on Demand Management performed by the business. Non-performance based allowances such as the Demand Management Innovation Allowance Scheme; equity raising costs and debt raising cost allowances are not included in this table.

Source of information

EBSS

EBSS revenue adjustments have been sourced from the AER’s Final Decision PTRM for Endeavour Energy for the determination period 2014-15 to 2018-19, adjusted for inflation.

EBSS revenue adjustments apply to standard control services revenue only. There are no EBSS revenue adjustments for alternate control services.

STPIS

Revenue rewards and penalties under the STPIS scheme do not apply in 2015-16.

F-factor

Not applicable to Endeavour Energy

S-factor true-up

Not applicable to Endeavour Energy

Other - Annual D-Factor

D-Factor revenue allowance has been sourced from annual D-Factor submissions to the AER.

Year	Source
2016	Endeavour Energy - Report on Demand Management Projects 2013-14 (October 2014)

D-Factor revenue adjustments apply to standard control services revenue only. There are no D-Factor revenue adjustments for alternate control services.

Methodology and assumptions

EBSS data is sourced from the AER’s Final Decision PTRM for Endeavour Energy. The AER’s final decision figure has been escalated from \$13-14 to \$15-16 using actual CPI.

D-Factor data is sourced from audited reports as submitted and approved by the relevant regulatory body.

Use of estimated information

Not applicable.

Material accounting policy changes

Not applicable.

Reliability of information

EBSS data is sourced from the AER's Final Decision PTRM for Endeavour Energy for the determination period 2014-15 to 2018-19, adjusted for inflation.

D-Factor data is sourced from audited annual reports as submitted to the relevant regulatory body.

Worksheet 3.2 – Operational Expenditure

3.2.1 Operating Expenditure Categories

3.2.2 Operating Expenditure Consistency

Compliance with requirements of the notice

The data presented in the tables contained in section 3.2 is consistent with the requirements of the Economic Benchmarking RIN. In particular:

- The data presented in tables 3.2.1 and 3.2.2 represents operating expenditure split into Standard Control Services and Alternative Control Services in accordance with the definitions of these services provided in chapter 9 of the Economic Benchmarking RIN.
- The operating expenditure presented in table 3.2.1 is reported in accordance with the categories reported in in response to Endeavour Energy's Annual Reporting Requirements and reconciles to the 2015-16 Annual RIN. Operating expenditure has been reported in accordance with the requirements of the Cost Allocation Approach and the Regulatory Accounting Statements for 2015-16.
- Endeavour Energy has reported operating expenditure in table 3.2.2 for the Opex Variables in accordance with current reporting arrangements (such as the Cost Allocation Approach). Where Endeavour Energy does not incur operating expenditure for a particular variable in table 3.2.2 a '0' has been entered into these cells.

Source of information

The information used to populate the tables contained in section 3.2 was extracted directly from TM1. Endeavour Energy uses this OLAP tool for various purposes including budgeting and forecasting, monthly reporting and regulatory account allocations. It is a cube based technology which allows rules to be created between cubes and within cubes.

Specifically, the AER Dollars By Account cube was used to obtain the required information for the tables contained in section 3.2. The AER Dollars By Account cube is used by Endeavour Energy to store and report operating expenditure into service categories (i.e. Standard Control, Alternate Control and Unregulated categories) at the account code level. It is the primary tool used to allocate operating expenditure in accordance with Endeavour Energy's approved Cost Allocation Method.

Methodology and Assumptions

The following table sets out the methodology applied to calculate the required data for the tables contained in section 3.2 of the Economic Benchmarking RIN.

Table	Methodology	Assumptions
3.2.1	<p>The information required for table 3.2.1 was already prepared and reported as part of the Annual RIN. Therefore, this information was transposed from the Annual RIN rather than being recalculated. However, set out below are the steps performed as part of the Annual RIN process in order to calculate the required information.</p> <ol style="list-style-type: none">1. Extract operating expenditure data from the TM1 AER Dollars By Account cube at the AER category levels for both standard and alternate control.2. Populate table 3.2.1 with the results of the above steps in accordance with the RIN instructions & definitions.	None.

Table	Methodology	Assumptions
	<p><i>Note: given TM1 AER Dollars By Account cube data is available and based on actual operating expenditure results for the year and the approved CAM, all information provided for this table consists of actual information (no estimated information required).</i></p>	
3.2.2	<p>1. Obtain operating expenditure for the year related to Standard Control, Metering Services, Ancillary Network Services and Public Lighting from the AER Dollars By Account cube in TM1</p> <p>3. Populate table 3.2.2 based on the data extracted from TM1.</p>	

Use of estimated information

Endeavour Energy has not used Estimated Information, as defined in chapter 9 of the Economic Benchmarking RIN Instructions & Definitions, in completing table 3.2.1.

Material accounting policy changes

Endeavour Energy have not undertaken any material changes in accounting policies which would impact the data contained in the tables in section 3.2.

Reliability of information

All the information provided in section 3.2 represents actual information extracted from Endeavour Energy's reporting systems and reconciled to figures reported in the Annual RIN. As a result, the information reported in the tables contained in section 3.2 is considered to be reliable.

3.2.3 Provisions

Compliance with requirements of the notice

The data presented in Table 3.2.3 Provisions is consistent with requirements of the Economic Benchmarking RIN. In particular:

- Data presented in Table 3.2.3 Provisions covers the 2015-16 period with respect to financial information on provisions relating to Standard Control Services, in accordance with the cost allocation methodology.
- Financial information provided relates to individual provisions as follows:
 - A Employee Entitlements
 - B Self Insurance
 - C Defined Benefits Superannuation
 - D Other
 - E Dividends
- Each individual provision has been specified by name and variable codes for the respective line items have been separately identified as required.

Source of information

Source information used to populate Table 3.2.3 Provisions was extracted from the Annual Financial Statements, Note 14 Provisions which details opening balances, additional provisions, amounts used, amounts reversed and closing balance amounts for each of the provision types listed in the note.

Methodology and assumptions

The Provisions schedule details the opening balance, additional provisions, amounts used (paid), unused amounts reversed, impact of change in discount rates (if applicable) and closing balance for each provision. The 2015-16 opening balance was based on the 2014-15 closing balance rolled forward. The closing balance and movements for each provision were derived by applying relevant allocation driver percentages, updated for 2015-16 financial year information, to the closing balance and movements consistent with the Annual Financial Statements, adjusted for errors identified post completion of the annual financial statements (if any).

Use of the prior year closing balance to equate to the current year opening balance creates an opening balance adjustment, due to variations in allocation drivers between years. All opening balance adjustments have been included within “additional provisions”, with the exception of Dividends where amounts used (paid) is consistent with the opening balance. Dividend provision amounts generally remain unchanged from the amount provided at year end, and are paid in the following year, therefore liabilities paid from the provision equate to the opening balance.

Allocation driver percentages applied to the closing balance and movements are based on the 2015-16 organisational unit structure utilising the relevant TM1 cube. A further dissection provides a split into Standard Control Services, Alternative Control Services and Unregulated Services based on application of relevant allocation drivers for the year. Employee Entitlements (A) utilise an employee entitlements allocation driver; Self-Insurance (Workers Compensation) (B) and Defined Benefits Superannuation (C) utilise labour allocation drivers; Other (D) utilises labour allocation drivers where relevant as well as direct allocation; Dividends (E) utilise Profit After Tax percentage outcomes consistent with the AER Annual Reporting RIN Income Statement split of Standard Control Services, Alternative Control Services and Unregulated Services where these services are reporting a profit.

Additional provisions, amounts used (paid) and unused amounts reversed for Employee Entitlements, Self Insurance, Defined Benefits Superannuation and Other have been split into Opex and Capex components, based on Endeavour Energy's internal Overhead Capitalisation model. The Capex component was determined based on a combination of the Network Headcount percentage and Network Capitalisation Rate. The balance was treated as Opex.

For both Employee Entitlements and Defined Benefit provisions, the movement pertaining to the discount rate (10 year Government Bond Rate) has been reported under "the increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate". For Employee Entitlements this amount is further split into Opex and Capex components based on Endeavour Energy's internal Overhead Capitalisation model. For Defined Benefits Superannuation the entire movement has been disclosed under "Other" since the movement during the period was recorded directly in Equity within the Annual Financial Statements. The discount rate for Employee Entitlements and Defined Benefits Superannuation was calculated based on information provided by the actuary.

All movements with respect to the Dividend provision were shown as an "Other" component, as these movements do not impact either Opex or Capex.

Use of estimated information

Endeavour Energy has used estimated information in determining a profit and loss split of Standard Control Services, Alternate Control Services and Unregulated Services for the period. The profit and loss split is required to allocate the Dividend provision consistent with profit after tax percentage outcomes for Standard Control Services and Alternate Control Services only, ignoring Unregulated Services as dividends do not apply to services with a loss after tax. This is a change from previous years as it more aligns with the principle of dividend creation.

Material accounting policy changes

Endeavour Energy has not undertaken any material change in accounting policies which would impact data contained in Table 3.2.3.

Reliability of information

All information provided is based on actual information extracted from the audited Annual Financial Statements. As a result the information contained in Table 3.2.3 is considered to be sufficiently reliable.

3.2.4 Opex for high voltage customers

Compliance with requirements of the notice

Estimates have been made for the OPEX that Endeavour Energy would have incurred had it owned the distribution transformers owned by HVC's. The OPEX estimates consist of substation inspections, network switching and fault & emergencies.

Source of information

Data that was used to produce the estimates include: Ellipse and past SAMP financial spreadsheets.

Methodology and assumptions

To estimate the substation inspection OPEX requirements:

- A query was run to see how many distribution in-service HVCs were in Ellipse.
- A query was run to see how many HVCs were currently already being inspected.
- The difference between the above two numbers provides the number of HVCs that would need to be inspected.
- A labour component of six man-hours was applied to each substation for an inspection. This was based on the standard job in Ellipse for Distribution Sub Inspections (Standard job number SI107).
- Labour rates used in the NMIP were used to calculate the OPEX requirement. The labour rate was obtained from the 2015-16 NMIP.

To estimate Fault & Emergency OPEX:

- A percentage was calculated based on OPEX actuals to determine a percentage of distribution F&E to distribution maintenance.
- The percentage calculated was then applied to the estimated OPEX derived for substation inspections to determine estimates for Fault & Emergencies.

To estimate Network Switching OPEX:

- A percentage was calculated based on OPEX actuals to determine a percentage of switching to the sum of F&E and distribution & transmission maintenance.
- This percentage was applied to the F&E estimates to determine estimates for switching.

The total estimated OPEX for HVC's is the sum of substation inspections, fault & emergencies and network switching.

Use of estimated information

Endeavour Energy has used estimated information for OPEX as the requirement is to provide what OPEX would have incurred if Endeavour Energy had owned the transformers in the HVCs.

Reliability of information

Information based on Ellipse data and corporate finance reports available at the time of preparation.

Worksheet 3.3 – Assets

3.3.1 Regulatory Asset Base (RAB) values

Compliance with requirements of the notice

Endeavour Energy has one Alternative Control Service that include a Regulatory Asset Base (RAB) as part of the current pricing arrangements, that being type 5 and 6 meter service provision. This is a change to prior years due to changes in service classification as part of the AER's April 2015 determination.

There is also a residual recovery amount for pre-2009 Public Lighting assets; however this value is not maintained in a RAB as defined in normal use.

Source of information

Table 3.3.1 is sourced from:

- The 2014-15 economic benchmarking RIN for the opening RAB for both standard and alternative control services;
- the SCS PTRM and the metering pricing model included with the AER final decision published in April 2015 updated for actual inflation for the inflation on the opening RAB;
- the SCS PTRM and the metering pricing model included with the AER final decision published in April 2015 updated for actual inflation for the straight line depreciation;
- Annual RIN preparatory files for actual network funded capex and proceeds from disposals;
- the SCS PTRM included with the AER final decision published in April 2015 updated for actual inflation for the nominal vanilla WACC to be applied to actual capex and proceeds from disposals in line with PTRM convention.

Methodology and assumptions

This table was completed using reference data contained in the Metering Model, SCS PTRM and RFM attachments to the AER's final decision for the 2014 to 2019 periods.

The instructions and description of this table seek to replicate the annual RAB roll forward processes, in particular noting the capex amount as recognised in the RFM.

Consequently this table and all subsequent RAB tables have adopted the treatment convention relating to metering assets as encapsulated in the AER's RFM.

Endeavour Energy has ensured that the mapping of the fixed asset register financial data was reconciled to the RFM values used by the AER in the 2014-19 distribution determination.

Leasehold improvements have been classified as other assets with long lives noting that the closest proxy for these investments is non-system buildings for which such leases and consequential improvements would most likely relate.

The CPI applied in the RFM and PTRM is that which applies for annual pricing purposes to ensure a matching between revenue adjustments for annual pricing purposes and the underlying revenue adjustments used for setting the revenue targets.

Use of estimated information

No variables were assumed in the completion of this table for standard control services. All information was drawn from AER decisions, published CPI data, or statutory information that is used as the basis for completing the annual RIN.

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in table 3.3.1.

Reliability of information

In light of the sources of information used to complete this table it is considered reliable for the purposes of confirming the RAB and changes in the RAB over time in accordance with the prevailing obligations and regulatory tools.

3.3.2 Asset value roll forward

Compliance with requirements of the notice

Endeavour Energy has applied the standard approach as set out in section 4.1.1 of the RIN Instructions and definitions. Endeavour Energy developed a map of the fixed asset register assets to the RIN RAB categories as set out in Chapter 9, Definitions.

The mapping of the financial information allowed for a direct allocation of each fixed asset register asset class to a single RIN RAB asset category allowing Endeavour Energy to adopt this approach. The mapping is consistent with that of prior years.

Consistent with the requirements of box 7 in section 4.1 RIN Instructions and definitions, where the AER is yet to make a determination on the RAB roll-forward for the years 2014-15 onwards Endeavour Energy has reconciled the RAB values as per those that will be utilised for the purposes of the annual RIN and RFM and are reconciled to amounts to be used in the Annual Financial Statements.

Source of information

Information has been sourced from:

- Endeavour Energy's fixed asset register;
- The PTRM and RFM provided to Endeavour Energy by the AER as part of the April 2015 NSW Distribution Determination;
- The Metering Pricing Model provided to Endeavour Energy by the AER as part of the April 2015 NSW Distribution Determination;
- The 2014-15 economic benchmarking RIN for the opening RAB for both standard and alternative control services;
- Endeavour Energy Statutory P&L allocated in accordance with the CAM; and
- Work papers for the 2015-16 Annual RIN.

Methodology and assumptions

The methodology applied by Endeavour Energy is to allocate RAB RFM and annual transactional amounts across the fixed asset register information on a weighted basis and then match these values to the relevant Benchmarking RIN RAB categories.

It is recognised that the RFM approach aggregates underlying asset class information and applies average assumptions regarding depreciation profiles as well as including adjustments that are not accounted for in Endeavour Energy's financial systems such as annual inflation escalation.

Consequently it is readily accepted that carrying amounts within Endeavour Energy's financial systems and transactions such as annual depreciation will not align due to regulatory adjustments as well as the compositional differences that arise through aggregation.

As a result, Endeavour Energy's methodology seeks to reflect the relative underlying service potential and the relative residual financial value of the RAB by apportioning actual RFM outcomes to actual fixed asset register information in line with the RIN RAB asset classes.

The linking of values between financial data and RFM data is essential to ensure that regulatory adjustments for transactional data such as capex and disposals accounts for RFM adjustments such as the escalation for the timing of recognising capex and disposals in the RFM by applying WACC^{0.5}.

This process is set out below.

Opening value = ((Sum of fixed asset register carrying amount for asset classes relevant to RAB asset class * Standard Control service allocation percentage)/Total Fixed Asset Register Carrying Amount Allocated to Standard Control Services) * RAB opening value

Inflation addition = (Opening value/Total RAB opening value) x Total RAB inflation addition

Straight line depreciation = (Sum of fixed asset register straight line depreciation for asset classes relevant to RAB asset class/Total fixed asset register straight line depreciation) x Total RAB straight line depreciation

Actual Additions = Sum of fixed asset register capex for asset classes relevant to RAB asset class * nominal vanilla WACC ^0.5

Disposals = Sum of fixed asset register disposals for asset classes relevant to RAB asset class * nominal vanilla WACC ^0.5

Closing Value = Opening value - Regulatory depreciation + Actual Additions – Disposals

Use of estimated information

Endeavour Energy has not used any estimated information to calculate the values in the standard control services elements of table 3.3.2, all sources of information are actual financial or actual determination amounts.

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact on the data in table 3.3.2.

Reliability of information

Endeavour Energy submits that the information is reliable as all amounts ultimately aggregate to either RAB values contained in the relevant Roll Forward or Pricing Models or audited statutory amounts.

3.3.3 Total disaggregated RAB asset values

Compliance with requirements of the notice

As set out in section 4.1.2 of the RIN Instructions and Definitions Endeavour Energy is required to calculate the values in this table as being the average of the opening and closing RAB asset class values from Table 4.2 above. The values in this table have been linked to the opening and closing RAB roll forward amounts as calculated in table 3.3.2.

Source of information

The information for table 3.3.3 was sourced from table 3.3.2.

The exception being capital contributions received that are sourced directly from the statutory financial values applying the same asset class mapping and service classifications as per table 3.2.1.

Methodology and assumptions

The calculation for each item in table 3.3.3 is as per below:

$(\text{Opening Value for RAB class 1} + \text{Closing Value for RAB class 1}) / 2$

Capital contributions received are those amounts allocated to standard and alternative control service classifications as sourced from Endeavour Energy's statutory accounting information.

Use of estimated information

Endeavour Energy has not used estimated information specifically for table 3.3.3. All information sourced from table 3.3.2 is dependent upon actual financial information and application of the RAB Framework.

The only exception being capital contributions that is sourced from the audited statutory accounts.

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data in table 3.3.3.

Reliability of information

Table 3.3.3 is directly linked to table 3.3.2 and hence the reliability of the information in table 3.3.3 is directly equivalent to that as per table 3.3.2 above. The only exception being capital contributions that have been audited as part of the statutory account preparation.

3.3.4 Asset lives

Compliance with requirements of the notice

As set out in section 4.1.2 of the RIN Instructions and Definitions Endeavour Energy is required to apply a weighted average life calculation to determine the standard and remaining lives. These lives will represent the proportional contribution of the fixed asset register asset classes, their actual standard and remaining lives and actual financial values.

Source of information

The data for table 3.3.4 was sourced from actual fixed asset register information for each year of reporting.

Methodology and assumptions

To determine the **standard** life for each asset class required by the RIN, Endeavour Energy calculated the Weighted Average Standard life using the underlying fixed asset register asset class information. This methodology is unchanged from prior years.

Algebraically this approach can be described as

$$\text{Service life of new assets} = \frac{\sum_{j=1}^n \text{OCC}_j \times \text{Life}_j}{\sum_{j=1}^n \text{OCC}_j}$$

To determine the **remaining** life for each asset class required by the RIN, Endeavour Energy calculated the Weighted Average remaining life using the underlying fixed asset register asset class information.

Algebraically this approach can be described as

$$\text{Residual life of assets} = \frac{(\sum_{j=1}^n \text{WDV}_j / \sum_{j=1}^n \text{OCC}_j) \times \text{Life}_j}{\sum_{j=1}^n \text{OCC}_j}$$

Where:

n is the number of individual assets in an AER asset class

OCC_j is the Opening Capital Cost of individual asset j

WDV_j is the Written Down Value of individual asset j

Life_j is the standard life of individual asset j

Dep_j is the Depreciation of individual asset j

It is noted that consistent with our pre-existing accounting policies a periodic revaluation exercise was undertaken in 2010-11 for statutory reporting purposes. The combined impact of both restatement of the original capital cost in line with a replacement cost methodology as well as a cash flow value in use impairment on the residual value was providing step changes in the calculated remaining asset lives, in the order of a 20 year reduction in expected life in some instances. To remedy the impact of these revaluation transactions, the impact on the asset register since that time was removed from the underlying data using the journals and work papers that supported the original adjustments. The resultant outcomes are presented without the impact of the periodic revaluation.

It has been assumed that the composition of network services metering assets and standard control services assets are equal and therefore have the same standard and remaining life expectations.

Use of estimated information

No estimated data was used in the calculation of the asset lives. All information used was drawn from actual fixed asset register information.

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in table 3.3.4.

Reliability of information

The data used in the calculations is all sourced from annual audited accounting information and is therefore considered reliable.

Worksheet 3.4 – Operational data

3.4.1 Energy delivery

Compliance with requirements of the notice

The data presented in the tables contained in section 3.4.1 is consistent with the requirements of the Economic Benchmarking RIN. In particular:

- The data presented in tables 3.4.1, 3.4.1.1 and 3.4.1.4 represents the total electricity transported out of Endeavour Energy's network (measured in GWh). This is reflective of the energy metered at the customers charging location (i.e. connection point) and reconciles to total energy consumption reported in management reports. The figures in these tables represent energy consumption reported for the financial year and therefore include year-end accruals;
- The data presented in table 3.4.1.1 reflects energy delivered in accordance with the category breakdowns as per the definitions provided in chapter 9 of the Economic Benchmarking RIN Instructions and Definitions. In particular, the peak, shoulder and off-peak periods relate to Endeavour Energy's own charging periods. Energy delivery where time of use is not a determinant is reflective of energy which is measured by an accumulation meter and charged on an accumulation basis;
- The data presented in table 3.4.1.2 reflects energy input into Endeavour Energy's network as measured at supply points from TransGrid and other DNSPs in accordance with the definitions provided in chapter 9 of the Economic Benchmarking RIN Instructions and Definitions. All energy input into Endeavour Energy's network from TransGrid or other DNSPs is measured as being received in either peak, shoulder or off-peak times and therefore there is nil energy received from TNSP and other DNSPs not included in the above categories;
- The data presented in table 3.4.1.3 reflects energy input in Endeavour Energy's network by embedded generators, including residential embedded generators. The data is reported in accordance with the definitions provided in chapter 9 of the Economic Benchmarking RIN Instructions and Definitions. It is noted that energy received from residential embedded generators is measured on an accumulation basis and not measured by the time of receipt and therefore energy input from this source is allocated to the 'energy received from embedded generation not included in above categories from residential embedded generation' (DOPED0408) category; and
- The data presented in table 3.4.1.4 reflects energy delivered in accordance with the category breakdowns as per the definitions provided in chapter 9 of the Economic Benchmarking RIN Instructions and Definitions. This category breakdown is also consistent with the customer types reported in table 3.4.2.1.

Source of information

The information used to populate the tables contained in section 3.4.1 was extracted directly from TM1. Endeavour Energy uses this OLAP tool for various purposes including budgeting and forecasting, monthly reporting and regulatory account allocations and it has been used historically to provide data for previous audited Regulatory Accounts/RINs. It is a cube based technology which allows rules to be created between cubes and within cubes.

Set out in the table below are the specific cubes used to obtain the required information for the tables in section 3.4.1, along with a description in relation to the use of the cube by Endeavour Energy:

Table	TM1 Cube	Description
3.4.1, 3.4.1.1 & 3.4.1.4	NUoS cube	The NUoS cube is used by Endeavour Energy to store and report billed, accrued and import data related to energy volumes, customer numbers and demand KW/kVA and calculate associated revenue outcomes (i.e. energy revenue, NAC revenue and demand revenue) at the network tariff level. It is the primary tool used to calculate the month end revenue accrual and report on month end revenue results and is also used extensively for budgeting and forecasting revenue related items.
3.4.1.2 & 3.4.1.3	TUoS Reconciliation cube	The TUoS Reconciliation cube is primarily used by Endeavour Energy to reconcile TransGrid's monthly TUoS invoice with internal system import data for the month. In performing this task, the TUoS Reconciliation cube contains information regarding system imports and peak demand by Bulk Supply Point ('BSP') and for each embedded generator (including residential solar system imports). The TUoS Reconciliation cube is also used to calculate and report on total system imports for the month which is used in the monthly NUoS accrual process.

Methodology and Assumptions

The following table sets out the methodology applied to calculate the required data for each of the tables in section 3.4.1.

Table	Methodology	Assumptions
3.4.1, 3.4.1.1 & 3.4.1.4	<ol style="list-style-type: none"> 1. Extract energy consumption data from the TM1 NUoS cube at the network tariff level for the financial year and by time period of consumption (i.e. Peak, Shoulder, Off-peak and Non TOU). 2. Reconcile the total derived at the individual network tariff level to the total from the TM1 NUoS cube to ensure no network tariffs have been excluded. 3. Populate tables 3.4.1, 3.4.1.1 and 3.4.1.4 from the detailed TM1 NUoS cube data in accordance with the Benchmarking RIN Instructions & Definitions. <p><i>Note: given TM1 NUoS cube data is available and represents previously reported figures, all information provided for these tables consists of Actual Information (no Estimated Information required).</i></p>	None.
3.4.1.2	<ol style="list-style-type: none"> 1. Extract TransGrid system import data from the TM1 TUoS Reconciliation cube at the BSP level for the financial year and by time period of delivery to the network by TransGrid (i.e. Peak, Shoulder and Off-peak). 2. Reconcile the total derived at the BSP level to the total from the TM1 TUoS Reconciliation cube to ensure no BSPs have been excluded. 3. TransGrid system import data from the TM1 TUoS Reconciliation cube is used to populate table 3.4.1.2 in accordance with the Benchmarking RIN Instructions & Definitions. <p><i>Note: given TM1 TUoS Reconciliation cube data for TransGrid system imports is available and represents previously reported figures, all information provided for this table consists of Actual Information (no Estimated Information required).</i></p>	None.
3.4.1.3	<ol style="list-style-type: none"> 1. Extract embedded generation system import data from the TM1 	None.

Table	Methodology	Assumptions
	<p>TUoS Reconciliation cube at the embedded generator level for the financial year and by time period of delivery to the network (i.e. Peak, Shoulder and Off-peak).</p> <p>2. Reconcile the total derived at the embedded generator level to the total from the TM1 TUoS Reconciliation cube to ensure no embedded generators have been excluded.</p> <p>3. Embedded generator system import data from the TM1 TUoS Reconciliation cube is used to populate the table in accordance with the Benchmarking RIN Instructions & Definitions.</p> <p><i>Note: given TM1 TUoS Reconciliation cube data for Embedded Generation system imports is available and represents previously reported figures, all information provided for this table consists of Actual Information (no Estimated Information required).</i></p>	

Use of estimated information

Endeavour Energy has not used Estimated Information, as defined in chapter 9 of the Economic Benchmarking RIN Instructions & Definitions, in completing the tables in section 3.4.1.

Material accounting policy changes

Endeavour Energy have not undertaken any material changes in accounting policies which would impact the data contained in the tables in section 3.4.1.

Reliability of information

All the information provided for the financial year represents Actual Information extracted from Endeavour Energy's reporting systems and reconciles to information reported to management. As a result, the information contained in the tables in section 3.4.1 is considered to be reliable.

3.4.2 Customer Numbers

Compliance with requirements of the notice

The data presented in the tables contained in section 3.4.2 is consistent with the requirements of the Economic Benchmarking RIN. In particular:

- The data presented in tables 3.4.2.1 and 3.4.2.2 represents the average number of NMIs in Endeavour Energy's network for the financial year (except for unmetered customers, which is the number of connection points), calculated as the average of the number of NMIs on the first day of the regulatory year and on the last day of the regulatory year. Both energised and de-energised NMIs are included and extinct NMIs are not included. In addition, customer numbers have been reported in accordance with the categorisation as per the definitions provided in chapter 9 of the Benchmarking RIN Instructions & Definitions;
- Unmetered customer numbers presented in table 3.4.2.1 represents the sum of connections (excluding public lighting connections) in Endeavour Energy's network that do not have a NMI and the energy usage for billing purposes is calculated using an assumed load profile. For Endeavour Energy, this predominantly includes unmetered connections related to bus shelters, telephone boxes etc. These figures specifically exclude unmetered connections related to traffic signals on the basis that the customer for the connections has a market NMI and therefore does not meet the definition of an unmetered customer. In addition, public lighting connections are not included in the unmetered customer category but rather included in the 'Non-residential customers not on demand tariff customer numbers' (DOPCN0102) category; and
- In order to account for the fact that unmetered connections related to traffic signals have been specifically excluded from the definition of unmetered customers, table 3.4.2.4 provides the number of unmetered connections reported, and the number of unmetered connections not reported (i.e. unmetered connections related to traffic signals), in unmetered customers in table 3.4.2.1.

Source of information

Table 3.4.2.1 - Customer numbers excluding unmetered customers & de-energised customers

The information used to populate table 3.4.2.1 (excluding unmetered customers and de-energised customers) was extracted directly from TM1. Endeavour Energy uses this OLAP tool for various purposes including budgeting and forecasting, monthly reporting and regulatory account allocations and it has been used historically to provide data for previous audited Regulatory Accounts/RINs. It is a cube based technology which allows rules to be created between cubes and within cubes.

The information was extracted from the TM1 NUoS cube which is used by Endeavour Energy to store and report billed, accrued and import data related to energy volumes, customer numbers and demand KW/kVA and calculate associated revenue outcomes (i.e. energy revenue, NAC revenue and demand revenue) at the network tariff level. It is the primary tool used to calculate the month end NUoS accrual and report on month end NUoS results and is also used extensively for budgeting and forecasting NUoS related items.

Table 3.4.2.1 - Unmetered customers

The information used to calculate unmetered customer numbers by connection point was extracted from a monthly report provided to the default retailer in Endeavour Energy's network area. This report is generated from Endeavour Energy's billing system (Banner) and includes details of all unmetered connection points in Endeavour Energy's network area and also the date which each supply was connected.

Table 3.4.2.1 – De-energised customers

Customer numbers obtained from the TM1 NUoS cube originate from Endeavour Energy’s billing system and therefore only relate to active or energised customers. The number of de-energised customers was obtained from C9 Customer Count reports run from MSATS as at 30 June. The C9 Customer Count report includes details of customer numbers by status (i.e. Active, De-energised and Greenfield).

Table 3.4.2.2 – Distribution customer numbers by location on the network

Endeavour Energy disclose customer numbers by location on the network in the Electricity Network Performance Report submitted to the Regulator. This report was used, in conjunction with customer numbers reported in table 3.4.2.1, to calculate customer numbers by location on the network whilst ensuring the total customer numbers reconciles to table 3.4.2.1.

Methodology and Assumptions

The following table sets out the methodology applied to calculate the required data for each of the tables in section 3.4.2.

Table	Methodology	Assumptions
3.4.2.1	<p>1. Extract 30 June customer number data from the TM1 NUoS cube at the network tariff level. This data represents active or energised customers only and unmetered customer numbers represent the number of NMIs billed rather than the number of connection points. This information is used to calculate average customer numbers for the financial year (excluding unmetered customers and de-energised customers).</p> <p>2. Reconcile the total derived at the individual network tariff level to the total from the TM1 NUoS cube to ensure no network tariffs were excluded.</p> <p>3. In order to calculate unmetered customer numbers by connection point, Endeavour Energy utilised the information contained in a monthly report provided to the default retailer in Endeavour Energy’s network area. This report is generated from Endeavour Energy’s billing system (Banner) and includes details of all unmetered connection points in Endeavour Energy’s network area and also the date on which supply was connected.</p> <p>Using the dates from this report, the number of unmetered connection points at the end of the financial year was calculated along with the average for the financial year.</p> <p>4. In order to calculate the number of de-energised customers Endeavour Energy obtained MSATS C9 Customer Count reports as at 30 June. C9 Customer Count reports from MSATS detail the number of customers by status including Active, De-energised and Greenfield. An average for the financial year was calculated.</p> <p>5. Based on the results of the steps above, table 3.4.2.1 was populated. The total number of de-energised customers (calculated in step 4) was allocated to the ‘Other Customer Numbers’ (DOPCN0106) category on</p>	<p>A limitation with the unmetered connection point report utilised in step 3 is that it will only include details of unmetered connection points as at 1 March 2010 (date of Retail business sale) and any unmetered connection points added to the network from that date. However, given unmetered connection points represent items such as bus shelters, bill boards, telephone boxes etc, it is unlikely a material number of these would be removed from the network over time. In general, unmetered connection points increase in number over time. As a result, this limitation is considered an insignificant risk.</p>

Table	Methodology	Assumptions
	<p>the basis that de-energised customers do not have a network tariff assigned and therefore cannot be allocated to any of the other customer categories.</p> <p><i>Note: given the data used to populate table 3.4.2.1 is available and represents previously reported figures, all information provided for these tables consists of Actual Information (no Estimated Information required).</i></p>	
3.4.2.2	<p>1. Information on customer numbers by location on the network is reported in Endeavour Energy's annual Electricity Network Performance Report. These constitute averages for the year and, from 2013-14, include unmetered customers by connection point and de-energised customers.</p> <p>2. Total customer numbers from the Electricity Network Performance Report were reconciled to total customer numbers calculated for table 3.4.2.1. Given the variances identified were immaterial (i.e. less than 1%), total customer numbers from table 3.4.2.1 was prorated against the network location categories using the information from the Electricity Network Performance Report. This was done to ensure customer numbers per table 3.4.2.2 reconciled to the customer numbers in table 3.4.2.1.</p> <p>3. The customer numbers calculated in step 2 were used to populate table 3.4.2.2 in accordance with the Benchmarking RIN Instructions & Definitions.</p> <p><i>Note: given the data used to populate table 3.4.2.2 is available and represents previously reported figures, all information provided for these tables consists of Actual Information (no Estimated Information required).</i></p>	None.

Use of estimated information

Endeavour Energy has not used Estimated Information, as defined in chapter 9 of the Economic Benchmarking RIN Instructions & Definitions, in completing that tables in section 3.4.2.

Material accounting policy changes

Endeavour Energy have not undertaken any material changes in accounting policies which would impact the data contained in the tables in section 3.4.2.

Reliability of information

All the information provided for the financial year represents Actual Information extracted from Endeavour Energy's reporting systems and reconciles to information reported to management. As a result, the information contained in the tables in section 3.4.2 is considered to be reliable.

3.4.3 System demand

3.4.3.1 Annual system maximum demand characteristics at the zone substation level – MW measure

Compliance with requirements of the notice

The data presented in the tables contained in section 3.4.3.1 is consistent with the requirements of the Economic Benchmarking RIN.

Source of information

Network Load History Database, Summer Demand Forecast 2017-26.

Methodology and assumptions

Assumption – Upon determining the financial year for Endeavour Energy's maximum demand, the season (summer or winter) that the maximum demand falls in will become the assumed financial peak for all substations and high voltage customers.

E.g. FY2015-16 Endeavour Energy's maximum demand fell in summer. It is assumed that all individual substations and high voltage customers' maximum demand will also be in summer for FY2015-16.

DOPSD0101 – This was calculated by taking the summation of all individual zone substations and high voltage customers' maximum demand for the relevant financial year in MW.

DOPSD0102 – This was calculated by taking the summation of all individual zone substations and high voltage customers' weather corrected values at the 10% PoE MW level.

DOPSD0103 – This was calculated by taking the summation of all individual zone substations and high voltage customers' weather corrected values at the 50% PoE MW level.

DOPSD0104 – This was calculated by the summation of all zone substations and high voltage customers (in MW) by date and time and taking the maximum of the summated values.

DOPSD0105 – Summation of all zone substations and high voltage customers by date and time and applying a weather correction to the summated values at the 10% PoE MW Level.

DOPSD0106 – Summation of all zone substations and high voltage customers by date and time and applying a weather correction to the summated values at the 50% PoE MW Level.

Use of estimated information

No estimated figures were used for this section.

Reliability of information

Information has been directly taken from the Network Load History database and forecasting documents.

3.4.3.2 Annual system maximum demand characteristics at the transmission connection point – MW measure

Compliance with requirements of the notice

The data presented in the tables contained in section 3.4.3.2 is consistent with the requirements of the Economic Benchmarking RIN.

Source of information

Network Load History Database, Summer Demand Forecast 2017-26.

Methodology and assumptions

Assumption - Upon determining the financial year for Endeavour Energy's maximum demand, the season (summer or winter) that the maximum demand falls in will become the assumed financial peak for all substations.

E.g. FY2015-16 Endeavour Energy's maximum demand fell in summer. It is assumed that all individual substations demand will also be in summer for FY2015-16.

DOPSD0107 – This was calculated by taking the summation of all individual transmission substations (Endeavour Energy Bulk Supply Points) maximum demand for the relevant financial year in MVA and converted to MW by its respective power factor.

DOPSD0108 – This was calculated by the summation of all transmission substation (Endeavour Energy Bulk Supply Points) weather corrected values at the 10% PoE MW level.

DOPSD0109 – This was calculated by the summation of all transmission substation (Endeavour Energy Bulk Supply Points) temperature corrected values at the 50% PoE MW level.

DOPSD0110 – This was calculated by the summation of all transmission substations (Endeavour Energy Bulk Supply Points) in MW by date and time and taking the maximum of the summated values.

DOPSD0111 – Summation of all transmission substations (Endeavour Energy Bulk Supply Points) by date and time and applying a weather correction to the summated values at the 10% PoE MW Level.

DOPSD0112 – Summation of all transmission substations (Endeavour Energy Bulk Supply Points) by date and time and applying a weather correction to the summated values at the 50% PoE MW Level.

Use of estimated information

No estimated figures were used for this section.

Reliability of information

Information has been directly taken from the Network Load History database and forecasting documents.

3.4.3.3 Annual system maximum demand characteristics at the zone substation level – MVA measure

Compliance with requirements of the notice

The data presented in the tables contained in section 3.4.3.3 is consistent with the requirements of the Economic Benchmarking RIN.

Source of information

Network Load History Database, Summer Demand Forecast 2017-26.

Methodology and assumptions

Assumption – The power factors of the Endeavour Energy network provide an adequate conversion to MVA at the zone substation and high voltage customer level.

In this section DOPSD0201, DOPSD0204, DOPSD0205 and DOPSD0206 were calculated using the power factor from *Table 3.4.3.5 Power factor conversion between MVA and MW - DOPSD0301*.

DOPSD0202 - This was calculated by the summation of all individual zone substations and high voltage customer weather corrected values at the 10% PoE MVA level.

DOPSD0203 - This was calculated by the summation of all individual zone substations and high Voltage Customer weather corrected values at the 50% PoE MVA level.

Use of estimated information

No estimated figures were used for this section.

Reliability of information

Information has been calculated from the Network Load History database and forecasting documents.

3.4.3.4 Annual system maximum demand characteristics at the transmission connection point – MVA measure

Compliance with requirements of the notice

The data presented in the tables contained in section 3.4.3.4 is consistent with the requirements of the Economic Benchmarking RIN.

Source of information

Network Load History Database, Summer Demand Forecast 2017-26.

Methodology and assumptions

Assumption - The power factor of the Endeavour Energy network provide an adequate conversion to MVA for transmission connection points. DOPSD0207 – This was calculated by taking the summation of all individual transmission substations (EE Bulk Supply Points) maximum demand for the relevant financial year in MVA.

DOPSD0208 – This was calculated by taking the summation of all transmission substation (EE Bulk Supply Points) weather corrected values at the 10% PoE MVA level.

DOPSD0209 – This was calculated by taking the summation of all transmission substation (EE Bulk Supply Points) weather corrected values at the 50% PoE MVA level.

DOPSD0210 – This was calculated by the summation of all transmission substations (EE Bulk Supply Points) in MW by date and time and then finding the maximum of the summated values in MW and converted to MVA by its respective power factor.

DOPSD0211 – Summation of all transmission substations (EE Bulk Supply Points) by date and time and applying a weather correction to the summated values at the 10% PoE MW Level. A conversion to MVA was applied to its respective power factor.

DOPSD0212 – Summation of all transmission substations (EE Bulk Supply Points) by date and time and applying a weather correction to the summated values at the 50% PoE MW Level. A conversion to MVA was applied to its respective power factor.

Use of estimated information

No estimated figures were used for this section.

Reliability of information

Information has been directly taken from the Network Load History database and forecasting documents.

3.4.3.5 Power factor conversion between MVA and MW

Compliance with requirements of the notice

The data that has been supplied complies with the requirements of the notice as it has been calculated using the method outlined for the benchmark guidelines i.e. dividing the MW value by MVA to obtain the power factor. The Summer Demand Forecast (SDF) document contains MW and MVA data and calculated MVA for all zone substations in Endeavour Energy's network.

Source of information

- *Category Analysis RIN section 5.4 2014-15*
- *Summer Demand Forecast 2016 – 2025 (SDF Report)* [For substations not covered by Category RIN table 5.4]

Coincident/diversified load at 50% POE temperature control data used. If coincident/diversified load is not available, non-coincident/undiversified load was used.

Methodology and assumptions

Overall system power factor

This is the calculated power factor derived from actual total system coincident MW and MVA load history. This power factor is a published value in the annual Summer Demand Forecast.

132kV

The average power factor was found by calculating the sum of all corresponding 132kV bulk supply point raw MW and raw MVA using data from the Category Analysis RIN or Summer Demand Forecast (SDF) report listed in the preceding section and then calculating the ratio of MW to MVA for the summated values.

66kV

The average power factor was found by calculating the sum of all corresponding 66kV bulk supply point raw MW and raw MVA and the 66kV secondary transmission substation MW and MVA using data from the Category Analysis RIN or Summer Demand Forecast (SDF) report listed in the preceding section and then calculating the ratio of MW to MVA for the summated values.

33kV

The average power factor was found by calculating the sum of all corresponding 33kV secondary transmission substation raw MW and raw MVA using data from the Summer Demand Forecast (SDF) report listed in the preceding section and then calculating the ratio of MW to MVA for the summated values.

11kV and 22kV

The average power factor was found by calculating the sum of all corresponding zone substation MW and MVA using data from the aforementioned Category Analysis RIN or SDF report.

Adjustments were made to MVA data by adding VARs associated with capacitor banks on the 11kV and 22kV busbar at zone substations in order to capture native MVA load.

12.7kV SWER

The PF of our SWER lines were taken to be the PF at Kandos ZS, where most of our SWER lines are located.

Low Voltage

There is no metering or SCADA information for the vast majority of the low voltage network. The power factor of our LV distribution network was assumed to be the same as the 11kV network power factor, since 11kV is the main network distribution voltage for Endeavour Energy.

Use of estimated information

Low Voltage power factor was estimated in line with the methodology and assumptions above.

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in the tables in this section.

Reliability of information

The assumptions that have been made were done as a best estimate due to the limited availability of data relating to the distribution and SWER lines.

The PF values included in this section are based on actual data and do not make use of estimates, making the information provided reliable.

3.4.3.6 & 3.4.3.7 Demand Supplied

Compliance with requirements of the notice

The data presented in tables 3.4.3.6 and 3.4.3.7 contained in section 3.4 is consistent with the requirements of the Economic Benchmarking RIN. In particular:

- The data presented in table 3.4.3.6 represents the total Maximum Demand amount supplied to customers as measured in MW. All Maximum Demand charges are based on measured Maximum Demand rather than contracted Maximum Demand; and
- The data presented in table 3.4.3.7 represents the total Maximum Demand amount supplied to customers as measured in MVA. All Maximum Demand charges are based on measured Maximum Demand rather than contracted Maximum Demand.

Source of information

The information used to populate tables 3.4.3.6 and 3.4.3.7 was extracted directly from TM1. Endeavour Energy uses this OLAP tool for various purposes including budgeting and forecasting, monthly reporting and regulatory account allocations and it has been used historically to provide data for previous audited Regulatory Accounts/RINs. It is a cube based technology which allows rules to be created between cubes and within cubes.

The information was extracted from the TM1 NUoS cube which is used by Endeavour Energy to store and report billed, accrued and import data related to energy volumes, customer numbers and demand KW/kVA and calculate associated revenue outcomes (i.e. energy revenue, NAC revenue and demand revenue) at the network tariff level. It is the primary tool used to calculate the month end NUoS accrual and report on month end NUoS results and is also used extensively for budgeting and forecasting NUoS related items.

Methodology and Assumptions

The following table sets out the methodology applied to calculate the required data for tables 3.4.3.6 and 3.4.3.7.

Table	Methodology	Assumptions
3.4.3.6	<p>1. Maximum Demand data was extracted from the TM1 NUoS cube at the network tariff level for the financial year.</p> <p>2. The total derived at the individual network tariff level was reconciled to the total from the TM1 NUoS cube to ensure no network tariffs were excluded from the extraction process.</p> <p>3. The detailed TM1 NUoS cube data was used to populate table 3.4.3.6 in accordance with the Benchmarking RIN Instructions & Definitions. Only those customers in Endeavour Energy's 'Bulk & Inter-Distributor Transfer' category are charged Maximum Demand on a measured MW basis.</p> <p><i>Note: given TM1 NUoS cube data is available and represents previously reported figures, all information provided for these tables consists of Actual Information (no Estimated Information required).</i></p>	None.
3.4.3.7	<p>1. Maximum Demand data was extracted from the TM1 NUoS cube at the network tariff level for the financial year.</p> <p>2. The total derived at the individual network tariff level was reconciled to the total from the TM1 NUoS cube to ensure no network tariffs were excluded from the extraction process.</p>	None.

Table	Methodology	Assumptions
	<p>3. The detailed TM1 NUoS cube data was used to populate table 3.4.3.7 in accordance with the Benchmarking RIN Instructions & Definitions. All customers, except those customers in Endeavour Energy's 'Bulk & Inter-Distributor Transfer' category, are charged Maximum Demand on a measured MVA basis.</p> <p><i>Note: given TM1 NUoS cube data is available and represents previously reported figures, all information provided for these tables consists of Actual Information (no Estimated Information required).</i></p>	

Use of estimated information

Endeavour Energy has not used Estimated Information, as defined in chapter 9 of the Economic Benchmarking RIN Instructions & Definitions, in completing tables 3.4.3.6 and 3.4.3.7.

Material accounting policy changes

Endeavour Energy have not undertaken any material changes in accounting policies which would impact the data contained in the tables 3.4.3.6 and 3.4.3.7.

Reliability of information

All the information provided represents Actual Information (as defined in chapter 9 of the Economic Benchmarking RIN Instructions & Definitions) extracted from Endeavour Energy's reporting systems. As a result, the information contained in the tables 3.4.3.6 and 3.4.3.7 is considered to be reliable.

Worksheet 3.5 – Physical assets

3.5.1 Network capacities

Compliance with requirements of the notice

Endeavour Energy has reported network circuit length and circuit capacity MVA capacities for low voltage to 132kV voltages in line with AER RIN Instructions and Definitions document for Final RIN for Economic Benchmarking.

3.5.1.1 Overhead network length of circuit at each voltage

3.5.1.2 Underground network circuit length at each voltage

DPA0101 to DPA0206 Circuit Lengths

Source of information

Circuit length actual data (DPA0101 to DPA0107 and DPA0201 to DPA0206) was determined from GIS production data as of 30 June for the reporting period. Circuit length is from GIS production data as at 30 June, end financial reporting year. Circuit length is determined using the same criteria as report statistics on the company intranet website.

Methodology and assumptions

A snapshot of GIS production data as at 30 June for the reporting period was considered the best available data for this reporting. Geospatial (GIS) systems do not have readily available historical or audit-trail records to enable this reporting, hence the use of the 30 June GIS snapshot data. Specific assumptions are detailed further in 'Use of estimated information'.

Use of estimated information

The information used to provide circuit lengths is derived from systems that are used in the normal course of business and thus are considered actual information. Our system is constantly updated and can produce dynamic results. The figures are accurate as at the time the report is generated.

3.5.1.3 Estimated overhead network weighted average MVA capacity by voltage class

3.5.1.4 Estimated underground network weighted average MVA capacity by voltage class

Compliance with requirements of the notice

The data presented in these tables is consistent with the requirements of the Economic Benchmarking RIN.

Source of information

The sources of information are other tables in the RIN as listed below:

- 30 June GIS data for this reporting period
- Conductor Code master
- Network Characteristics (33 – 132kV)

Methodology and assumptions

Low Volt and up to less than 33kV was determined from 30 June snapshot GIS data for the reporting period and Conductor Code ratings in line with prior year reporting. A small discrepancy in Circuit Capacity MVA for overhead SWER lines (treated as three phase) was noted in prior year reporting and corrected in calculations for this reporting period, otherwise methodology remains unchanged.

Network Characteristics database has a list of sub-transmission circuits for 33kV, 66kV and 132kV which are the standard operating voltages for Endeavour Energy.

The field used from the database in this calculation include:

- Voltage
- Section type (refers to construction type)
 - C = UG cable
 - L - OH line
 - ZT = transformer cable within substation (ignored)
 - O = other ratings limitation eg. CTs (ignored)
- Length km
- Summer Rating (the vast majority of Endeavour Energy's network is summer constrained) in amps.

For every section of line the "rating x km" is calculated.

This parameter as well as length is summed by voltage and construction type in a pivot table.

The weighted average capacity in amps for each voltage and construction type is then calculated based on the sum of "ratings x km" divided by length in km.

The weighted average capacity in amps is then converted to MVA.

Use of estimated information

Circuits with missing ratings data are ignored and not included in the calculation. Data ignores voltage limited capacity (not readily available - need to load flow) - capacity in some rural lines will be overstated. Data ignores line segments where there is missing ratings data.

Summer normal ratings assumed, as per AER instructions ratings are to be provided for normal circumstances as such emergency ratings ignored. The weighted average (weighted average capacity based on line length) overstates throughput capacity of the network due to various sections of different conductor being in series. Endeavour Energy will be limited by the lowest rated section.

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in the tables in this section.

Reliability of information

The information is reliable based on available data with some level of estimation as described above. The methodology here is more accurate than what was provided for the Reset Economic Benchmarking RIN as we are able to split underground/overhead and reflects ratings of individual sections where available.

3.5.2 Transformer capacities variables

Compliance with requirements of the notice

Endeavour Energy has reported Transformer capacities in line with AER RIN Instructions and Definitions.

Source of information

Organisation databases

- GIS - Geographic Information System, graphical based application used by the Company for the purpose of capturing and maintaining information pertaining to the Company's network assets. A snapshot copy of GIS as at 30 June for the reporting period was taken and this formed the source data for reporting purposes.
- Ellipse - The MINCOM Information Management System (an IT system used by Endeavour Energy for HR, Payroll, Logistics, Finance, Equipment). A snapshot copy of Ellipse as at 30 June for the reporting period was taken and this formed the source data for reporting purposes.

Methodology and assumptions

Data is sourced from the ELLIPSE nameplate for power transformers and as such is only as accurate as the data in the system.

Use of estimated information

Data is actual data sourced from the Endeavour Energy's asset management system, ELLIPSE-nameplate for power transformers.

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in the tables in this section.

Reliability of information

As noted above, Endeavour Energy has used available reported information for this section.

3.5.3 Public lighting

The number of luminaires, wood poles (dedicated) and columns (dedicated) is taken as of 30th June 2015 from the Street Lighting Usage of System (SLUoS) report for the financial year 2014-15 (1st July 2014 to 30th June 2015).

Compliance with requirements of the notice

The data provided is in line with the format provided.

Source of information

The information is extracted from the financial year end report of SLUoS for the month of June 2015. This report relies on the information on Ellipse data base of Endeavour Energy.

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 2015 was used to extract the data for 30th June 2015. The data for the assets installed and energised during the month of June 2015 are appropriated as the number of days in service in June 2015 times the asset/s installed in June 2015 divided by 30 (the total number of days in June 2015). Example: If 10 luminaires are installed in June 2015 for 27 days then the luminaire count for June 2015 will be $10 \times 27 / 30 = 9$. This methodology applies only for June 2015 as all other months have 100% active days.

No assumptions were made.

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.

Reliability of information

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

Worksheet 3.6 – Quality of service data

3.6.1 Reliability

Compliance with requirements of the notice

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

1. **Excluded incidents** have been determined in accordance with the requirements of the STPIS (3.3a)

Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3b) – and as per Endeavour Energy distribution determination 2015–16 to 2018–19 Attachment 11 – Service target performance incentive scheme April 2015.

The determination allows for the alternative Box cox methodology. The process is described in WPB 1012 – Calculation of Major Event Day Threshold.

Therefore, the 2015-16 MED SAIDI threshold is 3.76 and any day in the period that exceeded this threshold was classified as a MED.

2. **Outages affecting single premises** – Single premise outages that occur as a result of a fault on Endeavour Energy's network are included in the 2015-16 reliability result.
3. **Subsequent interruptions caused by network switching during fault finding**, in general switching operations associated with an unplanned incident may include subsequent interruptions to customers that are associated with fault finding. Current systems do not have any facility to identify these operations and therefore exclude them from reliability calculations. It should be noted that removing these operations from reliability calculations would result in an inaccurate record of actual customer experience.

Unplanned interruptions are sustained interruptions greater than one minute in accordance with the SAIDI definition in appendix A of the STPIS.

Source of information

1. **Base outage data (customers interrupted and CMI)**

2015-16 – Data sourced from OMS. All records in this database were validated and checked in accordance with a Work Place Instruction WPB1014.

Reporting tool – Cognos 10

2. **Customer numbers for calculation of SAIDI and SAIFI**

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

Methodology and assumptions

MED days – MED day threshold of 3.76 (2015-16 threshold) was applied, therefore any day in the period that exceeded this threshold was classified as a MED.

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

Use of estimated information

The information used to provide reliability statistics is derived from systems that are used in the normal course of business and thus considered to be actual information.

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in this section.

Reliability of information

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

3.6.2 Energy not supplied

Compliance with requirements of the notice

We were unable to fully comply with any of the methods prescribed by the AER in the Benchmarking RIN. Options were:

1. **average consumption of the customers interrupted based on their billing history;** - Current reporting systems do not support alignment of consumption data to individual customers interrupted and requires the manipulation of large amounts of data in multiple systems. Establishing a process to facilitate this would require significant development to reporting systems and databases.
2. **feeder demand at the time of the interruption divided by the number of customers on the feeder;** - feeder demand at the time of the outage is not recorded in the OMS
3. **average consumption of customers on the feeder based on their billing history;** - Customers in the billing system (Banner) do not have the feeder allocated.
4. **average feeder demand derived from feeder Maximum Demand and estimated load factor divided by the number of customers on the feeder.** – No definition provided to allow accurate allocation of load factor

The provided information is an estimation of data using a variant of option 1. Refer below for more detail.

Source of information

Energy not supplied - Unplanned – OMS customer minutes off supply used to calculate unplanned SAIDI in section 3.6.1.

Energy not supplied - Planned – Customer minutes off supply used to calculate Planned SAIDI 2013-14 Annual RIN. This data is supplied by System Control

Methodology and assumptions

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

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

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

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

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

Use of estimated information

Endeavour Energy has used estimated information for table 3.6.2 - refer above

- An estimate was required because we were unable to apply current or historical data to get actual information in accordance with the AER prescribed options.

Limitations included:

- lack of complete data for all reporting periods
- Available data in large volumes and separated across different information systems.
- merging data sets unmanageable and requires a large degree of assumptions to be made

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in the tables in this section.

Reliability of information

All information provided represents estimated information as the data for table 3.6.2 is not readily available or captured. This information should not be relied upon as an accurate estimation of the actual energy not supplied to customers when they are interrupted.

3.6.3 System Losses

Compliance with requirements of the notice

The data presented in table 3.6.3 contained in section 3.6 is consistent with the requirements of the Economic Benchmarking RIN. In particular:

- The data presented in table 3.6.3 represents system losses as the proportion of energy that is lost in distribution of electricity from the transmission network to Endeavour Energy customers; and
- System losses have been calculated as per the below equation as stipulated in the Economic Benchmarking RIN Instructions & Definitions:

Equation 2 Calculation of system losses

$$\text{system losses} = \frac{\text{electricity imported} - \text{electricity delivered}}{\text{electricity imported}} \times 100$$

Where:

Electricity imported is the total electricity inflow into Endeavour Energy's distribution network (including from Embedded Generation) minus the total electricity outflow into the networks of the adjacent connected distribution network service providers or the transmission network(s).

Electricity delivered is the amount of electricity transported out of Endeavour Energy's network to its customers as metered (or otherwise calculated) at the customer's connection.

This is a system wide figure not a feeder level figure.

Source of information

The information used to populate table 3.6.3 was extracted directly from TM1. Endeavour Energy uses this OLAP tool for various purposes including budgeting and forecasting, monthly reporting and regulatory account allocations and it has been used historically to provide data for previous audited Regulatory Accounts/RINs. It is a cube based technology which allows rules to be created between cubes and within cubes.

The information was extracted from the TM1 NUoS cube (energy delivered) and the TM1 TUoS Reconciliation Cube (energy imported). These cubes are used by Endeavour Energy to store and report energy import data, as well as data related to energy delivered, and calculate associated revenue outcomes (i.e. energy revenue, NAC revenue and demand revenue) at the network tariff level. It is the primary tool used to calculate the month end NUoS accrual and report on month end NUoS results and is also used extensively for budgeting and forecasting NUoS related items.

Methodology and Assumptions

As outlined above, system losses have been calculated in accordance with equation 2 of the Economic Benchmarking RIN Instructions & Definitions.

Use of estimated information

Endeavour Energy has not used Estimated Information, as defined in chapter 9 of the Economic Benchmarking RIN Instructions & Definitions, in completing table 3.6.3.

Material accounting policy changes

Endeavour Energy have not undertaken any material changes in accounting policies which would impact the data contained in the table 3.6.3.

Reliability of information

All the information provided represents Actual Information (as defined in chapter 9 of the Economic Benchmarking RIN Instructions & Definitions) extracted from Endeavour Energy's reporting systems. As a result, the information contained in the table 3.6.3 is considered to be reliable.

3.6.4 Capacity utilisation

Compliance with requirements of the notice

The data presented in table 3.6.4 is consistent with the requirements of the Economic Benchmarking RIN.

Source of information

The sources of information are other tables in the RIN as listed below:

- 3.5.2.2 Zone Substation Transformer Capacity
- 3.4.3.3 Annual system demand characteristics at the zone substation level

Methodology and assumptions

Utilisation is calculated reference other tables in the Economic Benchmarking RIN as per the formula below:

Overall utilisation (DQS04) = $DOPSD0201 / (DPA0602 + DPA0603 + DPA0605)$

This is the total undiversified maximum demand at zone substation level divided by the sum of zone substation transformer capacity.

Use of estimated information

Refer to basis of preparation for 3.4.3.3 and 3.5.2.2.

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in the tables in this section.

Reliability of information

Refer to basis of preparation for 3.4.3.3 and 3.5.2.2.

Worksheet 3.7 – Operating environment factors

3.7.1 Density factors

Compliance with requirements of the notice

The data presented in table 3.7.1 is consistent with the requirements of the Economic Benchmarking RIN.

Source of information

Customer density numbers use the figure in 3.4 Operational data worksheet, item DOPCN01. Route Line Length is from 3.7.3, item DOEF0301.

Energy density MWh (converted from GWh) figures are from worksheet 3.4, item DOPE01 in line with the AER definition.

Demand density MVA (converted to KVA) figures are from worksheet 3.4, item DOPSD0210 in line with the AER definition for using Zone Substation figures.

Actual sources of information are considered actual values as they are derived from systems that are used in the normal course of business.

Endeavour Energy has calculated the Energy and Demand density factors as follows:

- DOEF0102 is actual based on $DOPE01 * 1000 / DOPCN01$ for each year
- DOEF0103 is actual based on $(DOPSD0203 * 1000) / DOPCN01$ for each year

Methodology and assumptions

It is assumed the number of Customers, Route Line Length, GWh, and kVA, reported elsewhere in the RIN are correct and appropriate to the reporting required.

Use of estimated information

As the sources of information are considered to deliver actual values, the ratios of these quantities are also considered to be actual values.

Endeavour Energy has calculated Customer density factors as follows:

- DOEF0101 is estimated based on $DOPCN01 / DOEF0301$ for each year

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in the tables in this section.

Reliability of information

Information provided represents estimated and actual information as the data for table 3.7.1 is based on data reported elsewhere in the RIN.

3.7.2 Terrain factors

Compliance with requirements of the notice

The data presented in table 3.7.1 is consistent with the requirements of the Economic Benchmarking RIN.

Source of information

Information provided in table 3.7.2 was sourced from Endeavour Energy's Geographical Information System (GIS), Rural Fire Service map polygons applied to the GIS, a Scope and Audit review of vegetation management contracts using the work flow management system AM4, the Bureau of Meteorology web site and the Vegetation Program Completion Process.

Work flow Management System AM4:

The Active Tree Service "AM4 System" delivers to Endeavour Energy potential service improvements and cost savings through the provision of an auditable, sophisticated workflow management system that is geospatially enabled (including tracking) with real time data capability.

This product is built on Microsoft SQL Server 2008 R2 technologies, Microsoft SharePoint 2010 technologies, and the Esri ArcGIS Server and ArcGIS Mobile products.

Endeavour Energy implements the workflow described below to manage;

1. Vegetation Management contracts
2. Auditing function
3. the Defect management system to integrate with the Ellipse corporate asset database.

The Vegetation Program Completion Process is detailed in Branch Work Place Instruction WVM 0838. The purpose of this Branch Workplace Instruction is to define the process, including clarity of roles and responsibilities within the Vegetation Control Section of the Maintenance Branch. It is also to minimise business risk.

Methodology and assumptions

The assumptions made in regard to the data in Table 3.7.2 are as follows:

Average number of trees per urban and CBD vegetation maintenance span?

Average = total number of trees identified for trimming in urban areas divided by the total number of maintained spans in urban areas.

Average number of trees per rural vegetation maintenance span?

Average = total number of trees identified for trimming in rural areas divided by the total number of maintained spans in rural areas.

Number of spans and number of vegetation maintenance spans may have differences. This is due to the observation that more than one voltage level may exist over a single network span as explained in section 3.7.3 below, however the clearances for each voltage level are to be separately managed in accordance with the relevant clearance standard.

As each voltage level over a span represents a vegetation management span the number of vegetation management spans will exceed route length spans.

Average number of defects

Table 3.7.2 refers to the average number of defects in specific categories per maintenance span and the detail provided is the spans divided by the number of trees. The basis for using trees is because these have been fully scoped using the work flow management system AM4 and therefore are a more accurate count of the defect exposure.

A tree growing beneath a maintained span could have multiple non-compliances with the Network standards for clearances to overhead conductors and the removal of single branch often removes multiple defects. The records of defects in the corporate Ellipse database are not consistently accurate and can contain duplications. It is considered the methodology employed to record the average number of defects is a more accurate reflection of the number of defects per maintenance span.

Consequently, Endeavour Energy only records one defect based on tree counts. However, there may be multiple defects where multiple conductors exist over the same span and require different clearances. This is why the average trees and average defects by span are the same reported figure. This therefore will understate the number of defects reported per span.

Opportunities to refine this reporting on a forward looking basis are being considered and assessed for feasibility.

The approach we have adopted in table 3.7.2 is outlined below.

Average number of defects per urban and CBD vegetation maintenance span

Average = total number of trees identified for trimming in urban areas divided by the total number of maintained spans in urban areas.

Average number of defects per rural vegetation maintenance span

Average = total number of trees identified for trimming in rural areas divided by the total number of maintained spans in rural areas.

Standard vehicle access

Access = Total length of Transmission and Distribution conductors in Kms in accordance with the AER definition.

Variability

The number of defects identified in Urban, CBD and Rural vegetation maintenance spans have a natural variability each year dependent upon the climate effects of El Nino and La Nina.

Vegetation Management Process

The process is characterised in workplace instruction WMV-0838. The process describes in detail the methodology of the discrete contracts of work for Scope and Audit contract, Maintenance Cutting contracts and Auditing by Endeavour Energy staff of the cutting.

The Tropical proportion is zero as Endeavour Energy does not have any network in an area zoned as Tropical by the Bureau of Meteorology.

Use of estimated information

As specified in the methodology and assumptions section above.

Material accounting policy changes

Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in table 3.7.2.

Reliability of information

The information provided for the 2015-16 year is from the various Endeavour Energy systems as detailed above. The information provided for DOEF0202 and DOEF0205 has been calculated using the methodology and assumptions outlined above.

3.7.3 Service area factors

Compliance with requirements of the notice

The data presented in table 3.7.3 is consistent with the requirements of the Economic Benchmarking RIN.

Source of information

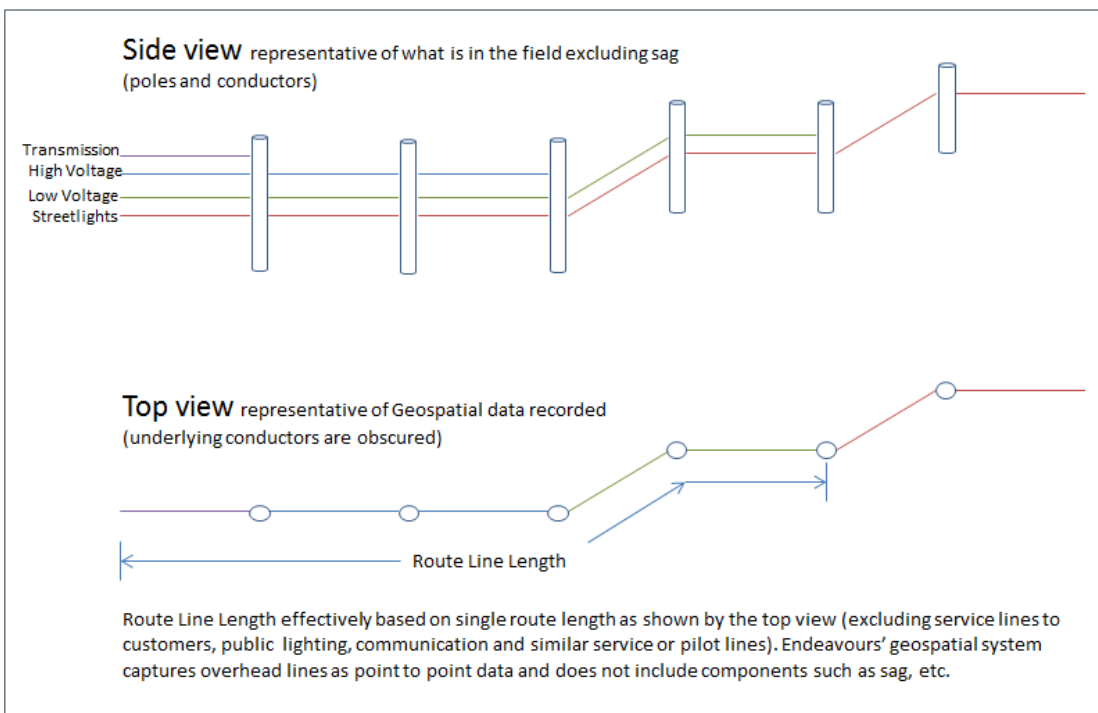
A snapshot of Endeavour Energy's GIS data as at 30 June for the reporting period was used to determine route line length (using two complex geospatial queries for both Overhead and Underground data). The Overhead route line length uses the same methodology and complex geospatial queries as in previous reporting periods.

Actual geospatial data was used as the basis for Underground route line length. Underground geospatial data is captured differently to how Overhead geospatial data is captured. Additionally not all Underground Duct geospatial data is available on Endeavour Energy's GIS system, therefore a mix of Duct data where available and Underground Conductor data was used. Determining the Underground route is complicated by the capture process which does not place conductors on top of each other where in the same route (Overhead conductors are placed on top of each other), rather Underground conductors are offset from each other. The mix of incomplete Duct data and offset Underground Conductor capture, required a complex geospatial method to determine Underground route length and this was developed in the prior year in consultation with a geospatial vendor. This process has been reviewed and updated in the current reporting period and there are variations in the result compared to prior year reported figures for Underground route line length.

Methodology and assumptions

Overhead Route Line Length (same method used as in previous reporting periods).

Complex geospatial queries were used to determine route line length. The below diagram, for Overhead route line length outlines how the query relates to assets in the field, including a comparison to how it is visually recorded as data (or layers) in Endeavour Energy's geospatial database. The spatial query reported conductor route length once, regardless of whether there were multiple layers (Transmission, High and Low voltage) or a single layer.



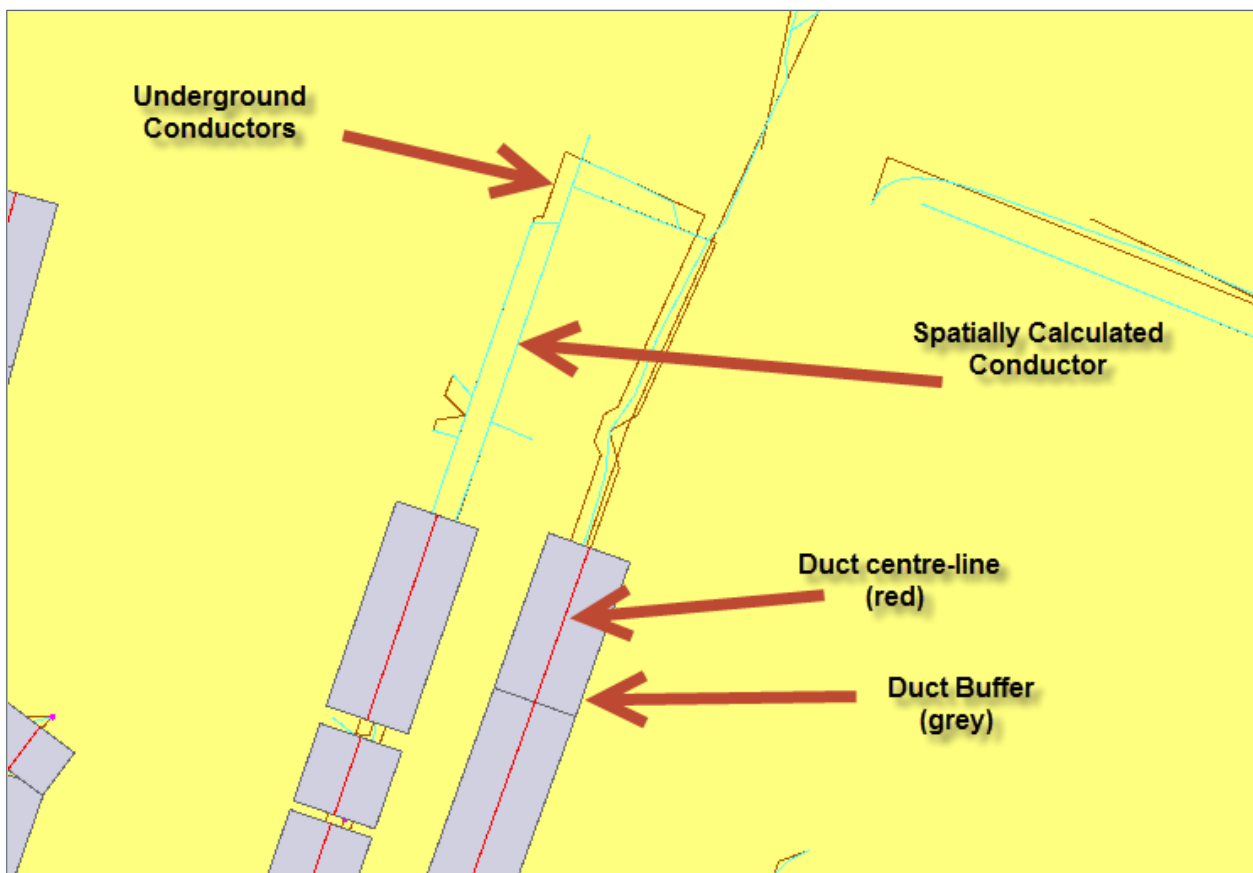
Underground Route Line Length (new method calculated from actual data)

Previous Underground route line length components were calculated based on ratios of Overhead circuit lengths. In line with reporting requirements from 2015, the method used this time is based on actual data for Underground route line length via a complex geospatial calculation. Circuit total lengths are available from historical reports. The method used to calculate Underground Route line length included use of the following (a) and (b) were added to determine total Underground Route Line Length:

- a) current Underground Ducts, where captured (Duct centre-line, in the screenshot below)
- b) current Underground Circuit Total Length (Underground Conductors in the below screenshot, this may include a small component of Streetlights, though that component is expected to be minimised via the spatial operations (buffer, snapping, etc.). Except where inside a five metre buffer distance to Duct location (refer Duct Buffer (grey) in the screenshot below) – this was used for the Spatially Calculated Conductor [Route] as shown in the screenshot below (aqua coloured) Note: conductors more than two metres apart were treated as two separate Underground routes for the purpose of this calculation

Underground route line length was calculated via addition of Duct lengths + spatially calculated underground Conductor lengths where the underground Conductors were outside a five metre buffer for underground Ducts. The spatial calculation of underground Conductor route also used generalization and snapping techniques to obtain an approximation of actual underground route length.

Underground route line length was then added to Overhead route line length to determine total Route line length.



Use of estimated information

Endeavour Energy has used actual geospatial information to calculate via complex geospatial queries the route line length. It is noted Endeavour Energy's GIS systems do not have audit trails nor historical data readily available.

Material accounting policy changes

The spatial report process for this spatial data has been revised to try to improve the result reported – the prior report appears to have had larger than expected values for underground route lengths for some suburbs. Otherwise Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in the table in this section.

Reliability of information

All information provided represents calculated information based on actual data for table 3.7.3. Data is not in a readily available format to enable easy reporting, due to data captured (not all Underground ducts are recorded in the geospatial system) and capture standards (which does not accurately locate Underground conductors, rather these are offset relative to adjacent Underground conductors in the same ducts), therefore a complex geospatial query was used to derive the Underground Route line length.