Economic Benchmarking RIN

Basis of Preparation
2020-2021

Endeavour Energy

Contents

Purpose

The Economic Benchmarking 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 30 November 2021.

Australian Energy Regulator'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 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);
- GIS (Intergraph / Hexagon) – the asset database for geospatial asset information. GIS is Endeavours primary system for asset locations, including conductor locations and lengths. GIS is linked to Ellipse – equipment register for several (though not all) asset types. GIS also has links to other systems such as ESRI for streetlight outages, etc. Ellipse is Endeavour Energy's main asset database;
- 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 (OMS) and Advanced Distribution Management System (ADMS) monitor and control and distribution network providing an end-to-end, integrated view of the entire distribution system. Endeavour Energy used both systems within the reported timeframe to log outages and other events on its network. From 2012-13 onwards OMS has been used as the source of data for all reliability reporting. From April 2021 OMS was replaced by ADMS;
- 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.

3.1 Revenue

3.1 Revenue

3.1.1 Revenue grouping by chargeable quantity and 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.

3.1 Revenue

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	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). 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. 3. 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. 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. *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).*	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.
3.1.1 & 3.1.2 Non-DUoS Revenue	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. 2. For the purposes of table 3.1.2, 'Revenue from other customers' (DREV0206) represents the sum of all non-	None.

3.1 Revenue

	DUoS revenue (DREV0110 to DREV0113) from table 3.1.1. *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).*	

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 (deduced) 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.

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 2019-20 to 2023-24, adjusted for inflation.

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

STPIS
STPIS revenue adjustments have been sourced from the Annual Pricing Proposal.

3.1 Revenue

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

F-factor
Not applicable to Endeavour Energy.

S-factor true-up
The S-factor true-up occurred in FY20. There are no S-factor true-up amounts for FY21.

Other
The Other category has been used to report revenue adjustments for the Capital Expenditure Sharing Scheme (CESS).

CESS revenue adjustments have been sourced from the AER's Final Decision PTRM for Endeavour Energy for the determination period 2019-20 to 2023-24, adjusted for inflation.

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

Methodology and assumptions
EBSS and CESS data is sourced from the AER's Final Decision PTRM for Endeavour Energy. The AER's final decision figure has been escalated from $FY19 to $FY21 using actual CPI.

Use of estimated information
Not applicable.

Material accounting policy changes
Not applicable.

Reliability of information
All data is sourced from AER decisions adjusted for actual inflation where required. Actual inflation is calculated using the AER's control mechanism formula for the calculation of CPI in annual pricing proposal's.

3.2 Operational Expenditure

3.2 Operational Expenditure

3.2.1 Operational Expenditure Categories and 3.2.2 Operational Expenditure Consistency

Compliance with requirements of the notice

The data presented in tables 3.2.1 and 3.2.2 is consistent with the requirements of the Benchmarking RIN.

Source of information

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

Methodology and assumptions

The following tables set out the methodology applied to obtain the required data for tables 3.2.1 and 3.2.2.

Table	Methodology	Assumptions
3.2.1 – Operating Expenditure Categories	Actual expenditure for both standard and alternate control is sourced from AER Totex by account cube in TM1.	None
3.2.2 – Operating Expenditure Consistency	Data in 3.2.2 is an aggregation of numbers derived in 3.2.1.	None

Use of estimated information

None.

Reliability of information

Information reported in tables 3.2.1 and 3.2.2 consists of Actual Information extracted from Endeavour Energy's reporting systems and reconciles to opex figures calculated and reported in the Annual RIN. As a result, the information contained in tables 3.2.1 and 3.2.2 is considered to be reliable.

3.2.3 Provisions

Background

On an annual basis, Endeavour Energy must complete the AER Economic Benchmarking Regulatory Information Notice (RIN) which includes an analysis of Provisions.

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

3.2 Operational Expenditure

- Data presented in the RIN Provisions covers the regulatory 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 Distributions (only where applicable).

- 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

The source information used to populate the RIN Provisions was extracted initially from the Endeavour Energy Group Financial Statements (for the period ended 30 June 2021), Note 12 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. The Movement in Provisions schedule which is the basis for Note 12 Provisions in the Financial Statements is used as a base to split the various provisions into Standard Control, Alternate Control and Unregulated.

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 opening balance is based on the previous year closing balance rolled forward. The closing balance and movements for each provision were derived by applying relevant allocation driver percentages, updated for regulatory financial year information, to the closing balance and movements consistent with the annual Group Financial Statements, adjusted for any errors or misstatements identified post completion of the annual financial statements (where applicable).

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.

Allocation driver percentages applied to the closing balance and movements are based on the relevant 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) generally utilise an employee entitlements allocation driver; Self-Insurance (Workers Compensation) (B) and Defined Benefits Superannuation (C) utilise labour allocation drivers sourced from Labour expense in the TM1 Totex cube; Other (D) utilises labour allocation drivers where relevant as well as direct allocation (where more appropriate); Distributions (where applicable) (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 an allocation method utilising Endeavour Energy's internal Overhead Capitalisation

3.2 Operational Expenditure

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 Defined Benefit provisions, the movement pertaining to the discount rate (which is based on the Corporate 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”. Other movements further split into Opex and Capex components based on an allocation method utilising Endeavour energy’s internal Overhead Capitalisation model. The discount rate for Defined Benefits Superannuation was calculated based on information provided by the actuary.

All movements with respect to the Distribution provision (where applicable) are shown as an “Other” component, as these movements do not impact either Opex or Capex.

Listed below is the FY21 dissection into the RIN categories for illustrative purposes based on the Movements in Provisions schedule. Refer movement schedule tab.

	SCS				
Description	OPENING BALANCE - AS REPORTED PY	Additional provisions	Reversal*	Utilised	ENDING BALANCE
EMPLOYEE ENTITLEMENTS	(124,549,211.54)	- 39,140,055.14	566,758.26	35,728,977.61	- 127,393,530.80
DEFINED BENEFITS SUPERANNUATION	(20,197,160.85)	-	7,696,026.64	-	(12,501,134.20)
OTHER - LABOUR RELATED (BONUS)	(7,558,277.85)	- 9,173,167.19	-	5,151,473.26	(11,579,971.78)
SELF INSURANCE	(25,928,645.03)	- 3,127,526.47	6,566,788.60	2,012,730.39	(20,476,652.52)
OTHERS	(6,501,625.00)	- 1,285,303.15	5,910,000.00	346,598.15	(1,530,330.00)
Grand total - all provisions	(184,734,920.27)	(52,726,051.94)	20,739,573.50	43,239,779.40	(173,481,619.30)

	ACS				
Description	OPENING BALANCE - AS REPORTED PY	Additional provisions	Reversal*	Utilised	ENDING BALANCE
EMPLOYEE ENTITLEMENTS	(38,649,144.30)	- 16,907,519.24	244,825.31	15,434,019.56	- 39,877,818.67
DEFINED BENEFITS SUPERANNUATION	(8,241,544.91)	-	3,047,140.55	-	(5,194,404.36)
OTHER - LABOUR RELATED (BONUS)	(3,084,190.24)	- 3,631,994.92	-	2,039,658.10	(4,676,527.06)
SELF INSURANCE	(10,580,303.80)	- 1,238,302.98	2,600,033.59	796,914.13	(8,421,659.06)
OTHERS	(90,375.00)	- 19,573.14	90,000.00	5,278.14	(14,670.00)
Grand total - all provisions	(60,645,558.24)	(21,797,390.29)	5,981,999.45	18,275,869.93	(58,185,079.15)

	UNREG				
Description	OPENING BALANCE - AS REPORTED PY	Additional provisions	Reversal*	Utilised	ENDING BALANCE
EMPLOYEE ENTITLEMENTS	(6,261,805.85)	- 2,640,443.14	38,234.31	2,410,327.06	- 6,453,687.62
DEFINED BENEFITS SUPERANNUATION	(3,154,794.25)	-	575,032.81	-	(2,579,761.44)
OTHER - LABOUR RELATED (BONUS)	(1,180,602.15)	- 685,402.00	-	384,908.51	(1,481,095.64)
SELF INSURANCE	(4,050,051.53)	- 233,682.97	490,658.24	150,387.47	(3,642,688.78)
OTHERS	-	-	-	-	-
Grand total - all provisions	(14,647,253.77)	(3,559,528.11)	1,103,925.35	2,945,623.04	(14,157,233.48)

Based on the file above, this is linked into RIN Provisions template as shown below (extract only). Refer Movement Schedule tab.

3.2 Operational Expenditure

	Network headcount %	Cap Rate	Capex
FY21	61.47%	67.00%	41.19%

The discount rate for Defined Benefits Superannuation is the changes in financial assumptions in the actuarial report.

The capitalisation overhead rate is determined starting with data from the Capitalised Overhead model.

Material accounting policy changes
Endeavour Energy has not undertaken any material changes in accounting policies which would impact the data contained in regulatory reporting statement 3.2.3 apart from the basis of valuation of maturing allowance and long service leave. These provisions are based on its present value (also equal to its nominal value) plus on costs (previously based on an actuarial assessment). Majority of these benefits are current in nature and therefore there is no unconditional right to defer settlement of the obligation. Accordingly, the present value of these benefits is equal to its nominal value.

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

Use of estimated information
Standard Control Services, Alternative Control Services and Unregulated Services for the period for allocation of Distribution provision movements (only where applicable). The profit and loss split are required to allocate the Dividend provision consistent with profit after tax percentage outcomes (only where applicable).

3.2.4 Operational Expenditure 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 which are 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 includes:

- Ellipse asset database (Extracted using Cognos in July 2021); and
- Finance OPEX Spreadsheet (June 2021).

Methodology and assumptions
To estimate the substation inspection OPEX requirements:

- A query was run to determine the volume of in-service distribution HVCs were in Ellipse;
- A query was run to determine how many HVCs were currently being inspected by EE;
- The difference between the above provides the number of HVCs that would need to be inspected;

3.2 Operational Expenditure

- 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); and
- Average labour rate for SI107 was obtained from Finance. An overhead percentage was added to this rate. The percentage was calculated from Actuals.

To estimate Fault & Emergency OPEX:

- The proportion of distribution F&E compared to distribution maintenance was calculated based on OPEX actuals; and
- The percentage calculated was then applied to the estimated OPEX derived for substation inspections to determine the estimated Fault & Emergency costs.

To estimate Network Switching OPEX:

- The proportion of switching costs to the sum of F&E and distribution & transmission maintenance costs was calculated based on OPEX actuals; and
- This percentage was applied to the F&E estimates to determine the estimated switching costs.

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

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

3.3 Assets

3.3 Assets

3.3.1 Regulatory Asset Base Values

Compliance with requirements of the notice

Endeavour Energy has two Alternative Control Services that include a RAB as part of the current pricing arrangements, that being type 5 and 6 meter service provision and public lighting assets in service prior to July 2009. 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 FY20 economic benchmarking RIN for the opening RAB for both standard and alternative control services;
- The PTRM attached to the AER's 2019-24 final determination published April 2019 for SCS regulatory inflation, nominal vanilla WACC (with updated debt) and straight line depreciation;
- the metering pricing model and public lighting pricing model included with the AER final decision published in April 2019 for the ACS straight line depreciation; and
- Annual RIN preparatory files for actual network funded capex and proceeds from disposals for SCS and ACS.

Methodology and assumptions

This table was completed using reference data contained in the Metering Model and Public Lighting Model attachments to the AER's final decision for the 2019-24 period, and the PTRM attached to the AER's 2019-24 final determination.

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 and 2019-24 distribution determinations.

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 aligned to the timing conventions used in the RFM.

3.3 Assets

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 to adopt this approach. The mapping is consistent with that of prior years.

Source of information
Information has been sourced from:

- Endeavour Energy's fixed asset register;
- The PTRM and RFM included with the AER final decision published in April 2019;
- The metering pricing model and public lighting pricing model included with the AER final decision published in April 2019;
- The FY20 economic benchmarking RIN for the opening RAB for alternative control services;
- Endeavour Energy Statutory P&L allocated in accordance with the CAM; and
- Work papers for the FY21 Annual RIN.

Methodology and assumptions
Endeavour Energy sources the opening value for each category from the closing value from the previous year's reporting. In the first year of the regulatory control period (FY20), the opening value is adjusted for differences in forecast and actual net capex for year t-1 (FY19) using the RFM methodology. The inflation on this value is then linked to the overall inflation on the RAB taken from table 3.3.1 above.

The straight-line depreciation for each Benchmarking RIN asset class is calculated by apportioning the regulatory straight-line depreciation obtained from table 3.3.1 weighted by the opening value of each Benchmarking RIN asset class.

3.3 Assets

Actual additions and proceeds from disposals are drawn directly from fixed asset register data that has been mapped to the Benchmarking RIN asset classes and allocated where appropriate between service classifications.

This process is set out below.

Opening value = Closing value from the FY20 benchmarking RIN for each asset category (adjusted for differences in forecast and actual net capex for year t-1 (FY19) using the RFM methodology).

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

Straight line depreciation = (Opening value / Total RAB opening value) 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 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.

3.3 Assets

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:

(Opening Value for RAB class 1 + 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'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 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

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

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

3.3 Assets

Algebraically this approach can be described as

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

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.

3.4 Operational Data

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:

3.4 Operational Data

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	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. *Note: given TM1 NUoS cube data is available and represents previously reported figures, all information provided for these*	None.

3.4 Operational Data

	tables consists of Actual Information (no Estimated Information required).	
3.4.1.2	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. *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).*	None.
3.4.1.3	1. Extract embedded generation system import data from the TM1 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). 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. 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. *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).*	None.

3.4 Operational Data

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

3.4 Operational Data

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
Endeavour Energy disclose customer numbers by location on the network in the Annual RIN 6.2.4 (Distribution Customer Numbers). 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	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). 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.	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

3.4 Operational Data

	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. 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. 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. 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 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. *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).*	from that date. However, given unmetered connection points represent items such as bus shelters, billboards, 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.
3.4.2.2	1. Information on customer numbers by location on the network is reported in the Annual RIN 6.2.4 (Distribution Customer Numbers). These constitute averages for the year and, from FY14, include unmetered customers by connection point and de-energised customers. 2. Total customer numbers from the Annual RIN 6.2.4 (Distribution Customer Numbers) 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	None.

3.4 Operational Data

	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. 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. *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).*	

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 table 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
Historian Database, Summer Demand Forecast 2022-31.

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. FY21 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 FY21.

3.4 Operational Data

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 MVA converted to MW by its respective power factor.

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 Historian 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
Historian Database, Summer Demand Forecast 2022-31.

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. FY21 Endeavour Energy's maximum demand fell in summer. It is assumed that all individual substations demand will also be in summer for FY21.

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.

3.4 Operational Data

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 Historian 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
Historian Database, Summer Demand Forecast 2022-31.

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

In this section, DOPSD0204, DOPSD0205 and DOPSDO206 were calculated using the power factor from *Table 3.4.3.5 Power factor conversion between MVA and MW - DOPSD0301.*

DOPSD0201 - This was calculated by taking the summation of all individual zone substations and high voltage customers' maximum demand.

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.

3.4 Operational Data

Use of estimated information
No estimated figures were used for this section.

Reliability of information
Information has been calculated from the Historian 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
Historian Database, Summer Demand Forecast 2022-31.

Methodology and assumptions
Assumption - The power factor of the Endeavour Energy network provides 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 individual 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 individual 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 Historian database and forecasting documents.

3.4 Operational Data

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 MVAr data and calculated MVA for all zone substations in Endeavour Energy's network.

Source of information

Summer Demand Forecast 2022 – 2031 (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 MVAr 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 MVAr 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 MVAr and the 66kV secondary transmission substation MW and MVAr 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 MVAr 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 MVAR using data from the aforementioned SDF report.

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

3.4 Operational Data

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 (for customers charged)

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

3.4 Operational Data

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	1. Maximum Demand data was extracted from the TM1 NUoS cube at the network tariff level for the financial year. 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. 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. *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).*	None.
3.4.3.7	1. Maximum Demand data was extracted from the TM1 NUoS cube at the network tariff level for the financial year. 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. 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. *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).*	None.

3.4 Operational Data

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.

3.5 Physical Assets Expenditure

3.5 Physical Assets Expenditure

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 and 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 based on operating voltage.

Methodology and assumptions

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. Production systems are constantly updated and can produce dynamic results due to being constantly updated to reflect the network. Changes over short periods of time are considered negligible to RIN reported.

All GIS conductor codes have two voltage fields (operating and constructed), due to historical decisions Endeavour Energy's overhead 11kV network is flagged as constructed at 22kV. For the purposes of the RIN reporting the operating voltage has been used from FY20 forward as this is reflective of the actual capacity and capability of the assets (e.g. the 11kV network is only connected to an 11kV substation and almost all hardware (surge arresters and transformers) on the line are rated at 11kV).

3.5.1.3 Estimated overhead network weighted average MVA capacity by voltage class and 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:

- Conductor Code master (including revised ratings in line with Endeavour's MDI standards on ratings)

3.5 Physical Assets Expenditure

Methodology and assumptions

period and Conductor Code ratings that are inline within Endeavour Energy standards on conductor / cable ratings.

- Low Voltage underground MVA circuit capacity is based on actual data and ratings for common conductor types
- 11kV and 22kV underground MVA circuit capacity is based on actual data and ratings, with a de-rating factor of 0.871 applied for these conductors in line with common conductor configurations and common de-rating factors as indicated in company standard MDI0011.

The method for determining MVA circuit capacity for 33, 66 and 132kV is sourced for the Network Characteristics database. This database is an extract of the GIS transmission network with additional feeder specific details / data overlayed. Additional assumptions include:

- Feeder rating are taken from individual line specific segment ratings based on actual design / surrounding environmental conditions and limited to the lowest line / T-off segment applicable to that feeder. Normal continuous ratings are used for each feeder segment and emergency line capacity is ignored.

The weighted average capacity in amps for each voltage and construction type was 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.

Circuits with missing ratings data are ignored and not included in the calculation, however the volume of this data has been significant reduced and does not materially impact the outputs. Ratings for historical imperial sized conductor that no longer have a standard rating in current standards have been extrapolated / interpolated based on the cross-sectional area of standard metric cables

Data provided ignores voltage limited capacity (as it is not readily available), capacity in some rural lines will be overstated. Each conductor / cable segment is reported as the lower value of either the associated segment ratings or 220 Amps (the planning design limitation documented in SDI 501 “Sub-Transmission Network and Zone Substation Configuration”).

Summer normal ratings are assumed, underground assets are assumed to be in conduits. 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 conductors being in series. This limitation has not been considered for lines below 33kV.

3.5 Physical Assets Expenditure

Reliability of information
The information is reliable based on available data with some level of estimation as described above.

3.5.2 Transformer Capacities

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:

- 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;
- Reminda – metering system for maximum meter reading data in order to determine Distribution transformer capacity owned by High Voltage Customers (DPA0502) only; and
- GIS - A geographic information system where data on line ratings are stored and used for distribution feeder exit capacities.

Methodology and assumptions
Data is sourced from the Ellipse nameplate for transformers and as such is only as accurate as the data in the system. High Voltage Customer data is sourced from maximum meter reading data from the Reminda system.

Where distribution feeder exit capacities are absent from GIS, ratings were entered manually from system operating procedure sheets (SOPS) and maximum demand indicator (MDI) readings.

Due to distribution feeder cable proximities within substations, a derating factor of 0.772 was applied when calculating feeder exit capacity constraints. The derating factor was chosen as the average derating for three or four cables in parallel.

Use of estimated information
Data is actual data sourced from the Endeavour Energy's asset management system, Ellipse - nameplate for power transformers and feeder exit capacity from the geographic information system as per AER guidelines. A feeder derating factor has been applied to the feeder exit capacities. For High Voltage Customers (DPA0502) data is determined in accordance with AER guidelines using maximum meter reading data from Reminda.

Material accounting policy changes
To improve consistency Endeavour Energy has reverted the reporting methodology for DPA0603 (Distribution transformer capacity owned by utility) to align with reporting prior to FY20. All other reporting within 3.5.2. Transformer Capacities have not undertaken any material changes in accounting policies which would impact the data contained in this section.

3.5 Physical Assets Expenditure

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 30 June 2021 from the Street Lighting Usage of System (SLUoS) report for the financial year 2019-20 (1 July 2020 to 30 June 2021).

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 2021 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 Finance, Endeavour Energy, every month. The report for the month ending June 2021 was used to extract the data for 30 June 2021.

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.

3.6 Quality of Service Data

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 RIN. The following aspects are noted:

- excluded incidents detailed in table 6.8 have been determined in accordance with the requirements of the STPIS (3.3);
- Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3) – and as per Endeavour Energy distribution determination 2019-24 – Service target performance incentive scheme April 2019;
- the determination allows for the alternative Box cox methodology. The process is described in WPB 1012 – Calculation of Major Event Day Threshold;
- outages affecting single premises – Single premise outages that occur as a result of a fault on Endeavour Energy's network are included in the reliability result;

Subsequent interruptions caused by network switching during fault finding, in general switching operations associated with an unplanned incident may include subsequent interruptions to customers that are associated with fault finding. Current systems do not have any facility to identify these operations and therefore exclude them from reliability calculations. It should be noted that removing these operations from reliability calculations would result in an inaccurate record of actual customer experience.

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

Source of information

1. Base outage data (customers interrupted and CMI)

Data sourced from OMS from 1 July 2020 to 4 April 2021, and ADMS from 5 April 2021 to 30 June 2021. All OMS records in this database were validated and checked in accordance with a Workplace Instruction WPT0001 (supersedes WPB1014), whilst ADMS records were validated and checked in a similar manner where possible.

Planned interruption data sourced from SwitchIt database from 1 July 2020 to 4 April 2021, and ADMS from 5 April 2021 to 30 June 2021.

Reporting tools – Cognos 10, SQL Queries

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 and ADMS databases.

3.6 Quality of Service Data

Methodology and assumptions
MED days – MED day threshold of 4.364 (FY21 threshold) was applied, therefore any day in the period that exceeded this threshold was classified as a MED.

Excluded interruptions – Excluded interruptions are based on a cause or a factor that is assigned to each interruption in accordance with STPIS 3.3.

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:

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.

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 and ADMS.

Average consumption of customers on the feeder based on their billing history
Customers in the billing system (Banner) do not have the feeder allocated.

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 and ADMS customer minutes off supply used to calculate unplanned SAIDI in section 3.6.1.

3.6 Quality of Service Data

Energy not supplied - Planned – Customer minutes off supply used to calculate Planned SAIDI FY20 Annual RIN. This data is sourced from previous system (SwitchIt) for 1 July 2020 to 4 April 2021, from ADMS for 5 April 2021 to 30 June 2021, and then aggregated together.

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 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; AND
- 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:

3.6 Quality of Service Data

- 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

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

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.

3.6 Quality of Service Data

Material accounting policy changes
Endeavour Energy has 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; and
- 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.

3.7 Operating Environment Factors

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 DOPED01 in line with the AER definition.

Demand density MVA (converted to KVA) figures are from worksheet 3.4, item DOPSD0203 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 DOPED01 * 1000/DOPCN01 for each year (refer sheet 3.4 Operational data); and
- DOEF0103 is actual based on (DOPSD0203* 1000)/DOPCN01 (refer sheet 3.4 Operational data) 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. (refer sheet 3.4 Operational data and sheet 3.7 Operating environment)

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 Operating Environment Factors

3.7.2 Terrain Factors

Compliance with requirements of the notice

The data presented in table 3.7.2 is consistent with the requirements of the Economic Benchmarking RIN.

Source of information

Information provided in table 3.7.2 sets out the source of the data used.

Table	Metric	Source/Description
3.7.2	Rural proportion	Endeavour Energy's Geographical Information System (GIS)
	Vegetation Maintenance Spans	Asplundh Tree Expert – Vegetation Contractor
	Vegetation Maintenance Span Cycle	Endeavour Energy Vegetation Reporting Database
	Average number of trees per maintenance span	Network Mapping Group, Endeavour / Fugro LiDAR data.
	Average Number of defects per maintenance span	Asplundh Tree Expert – Vegetation Contractor
	Tropical Proportion	Australian Bureau of Meteorology
	Standard Vehicle Access	Endeavour Energy's Geographical Information System (GIS)
	Bushfire Risk	NSW Rural Fire Service / Endeavour Energy's Geographical Information System (GIS)

3.7 Operating Environment Factors

Methodology and assumptions

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

Table	Metric	Methodology	Assumptions
3.7.2	Rural proportion	The proportion of route line length classified as Rural. Spans were determined by breaking conductors at poles and towers within 1 metre of the conductor, to form a new spatial feature or span. The mid-point of each span was used to categorise it as either Urban or Rural, and to determine which Region and Depot it was associated with.	
	Vegetation Maintenance Spans (urban / rural / total)	The count of distinct spans that underwent active vegetation management over the period. Split by Urban/Rural and Total.	The count has described urban /CBD and rural from a vegetation perspective. A spatial query uses the Urban Centres and Localities (UCL) dataset from Australian Bureau of Statistics attached to the GIS data clipped to the Endeavour Energy franchise
	Total number of spans	GIS overhead lines capture is generally single line, with all voltage levels (transmission, high voltage, low voltage and streetlight conductors) recorded in GIS stacked on top of each other. The Overhead route length is conceptually the single line shadow of the network if the sun was directly overhead. Spans were determined by breaking conductors at poles and towers within 1 metre of the conductor, to form a new spatial feature or span.	Streetlight only spans are excluded in line with AER definitions.

3.7 Operating Environment Factors

		The mid-point of each span was used to categorise it as either Urban or Rural, and to determine which Region and Depot it was associated with.	
	Vegetation Maintenance Span Cycle	Mean of recorded maintenance cycle times per urban and rural vegetation areas.	
	Average number of trees per maintenance span*	This metric is calculated based on modelled canopy objects from LiDAR data. This is calculated by an independent Utility Vegetation Management expert consultant. See below.	Canopy counts are calculated as the number of canopies within 35m (or the extent of the LiDAR coverage) either side of the bay centreline. Averaged across each zone.
	Average Number of defects per maintenance span	The reported number of tree's trimmed divided by the total number of maintenance spans.	The basis for using trees is because these have been fully scoped by external contractors and therefore are a more accurate count of the defect exposure. A tree growing beneath a maintained span could have multiple non-compliances and the removal of single branch often removes multiple defects. 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.
	Tropical Proportion	The BOM Gridded Köppen classification was used, clipped to the Endeavour franchise area to determine the maximum climate level.	The BOM Gridded Köppen classification system was used as a means for determining tropical areas.

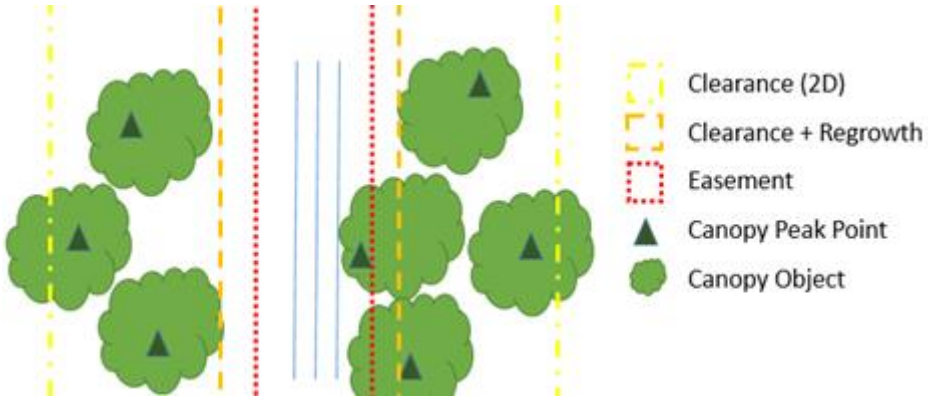
3.7 Operating Environment Factors

	Standard Vehicle Access	Access = Total length of Transmission and Distribution conductors in Kms in accordance with the AER definition.	
	Bushfire Risk	The count of maintenance spans that fall within the NSW Rural Fire Service Bushfire Prone Area spatial polygon.	The NSW RFS BFP areas polygon is used to determine bushfire risk areas. This includes all zones and buffers.

* Notes:

Canopy counts

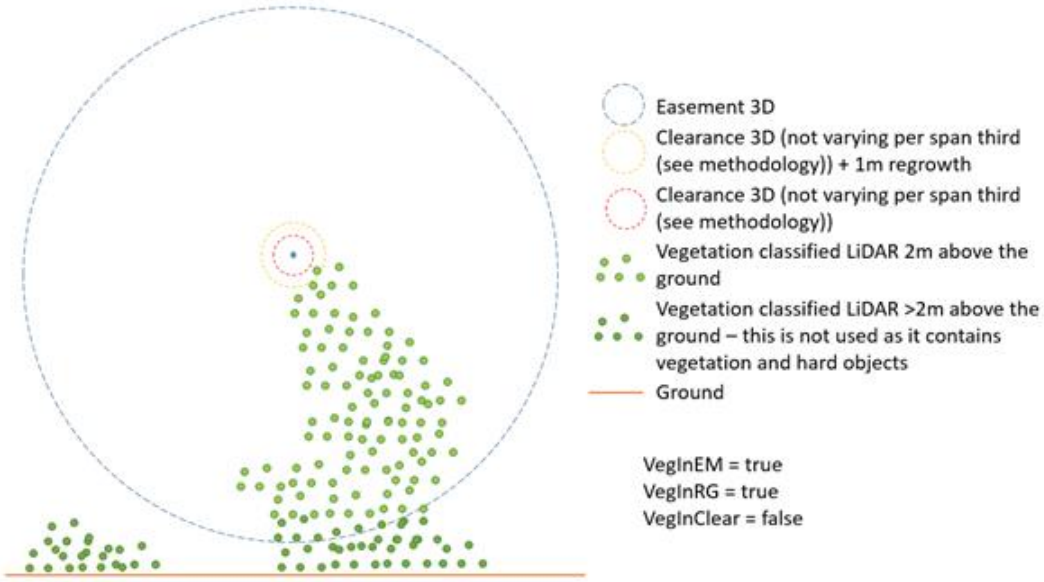
Counts are based on canopy object peak points appearing within different zones. In the example below, the number of canopies in the Clearance zone. = 1, Clearance + Regrowth = 1 and Easement = 7. This is to be applied in forming the canopies which are the basis for the GIS canopy file and falling-tree report.



Vegetation presence

The following diagram describes the logic for attributing a bay/span for the presence of vegetation in one of the three reporting zones:

3.7 Operating Environment Factors



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
Unless indicated as estimated, the information principally derived from Endeavour source systems as outlined in table 2.7.1 should be considered reliable. For data not residing in Endeavour source systems such as contractor data and expert consultant reports, auditing and QA checking is performed on this data.

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

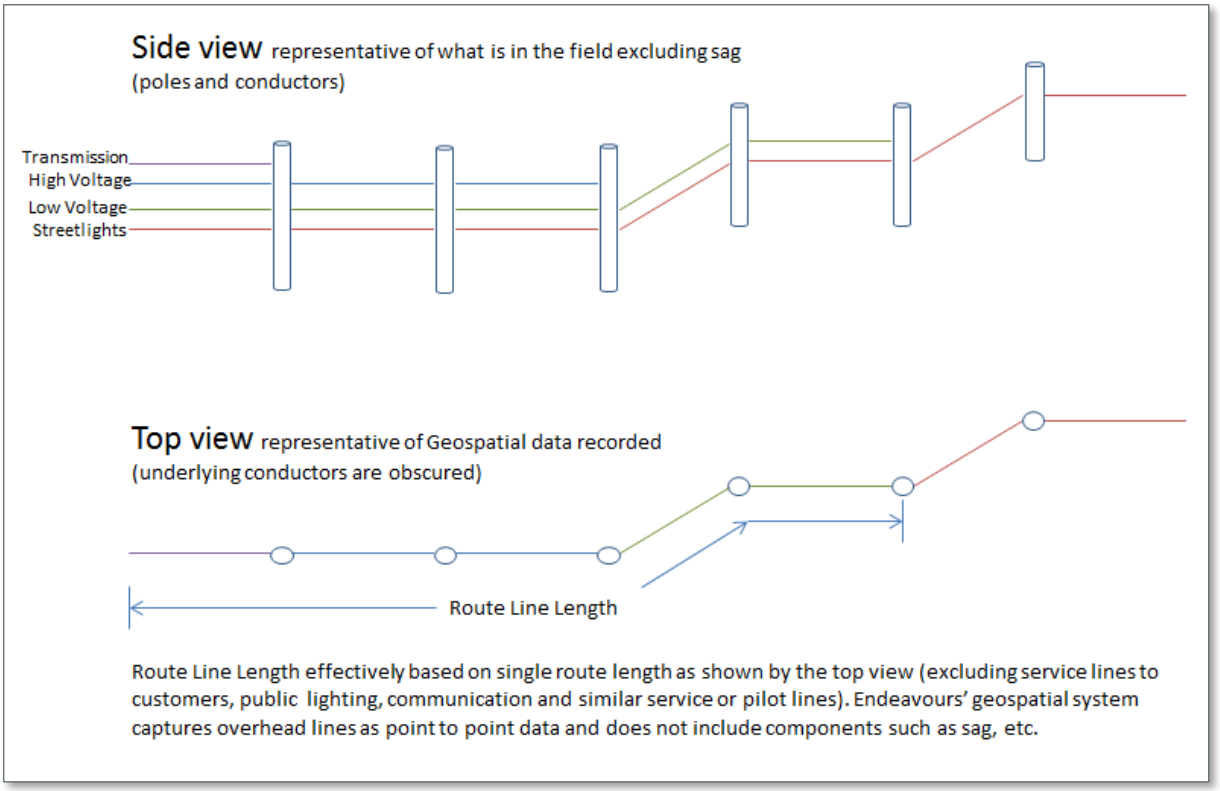
3.7 Operating Environment Factors

Overhead route line length uses the same methodology and complex geospatial queries as in previous reporting periods.

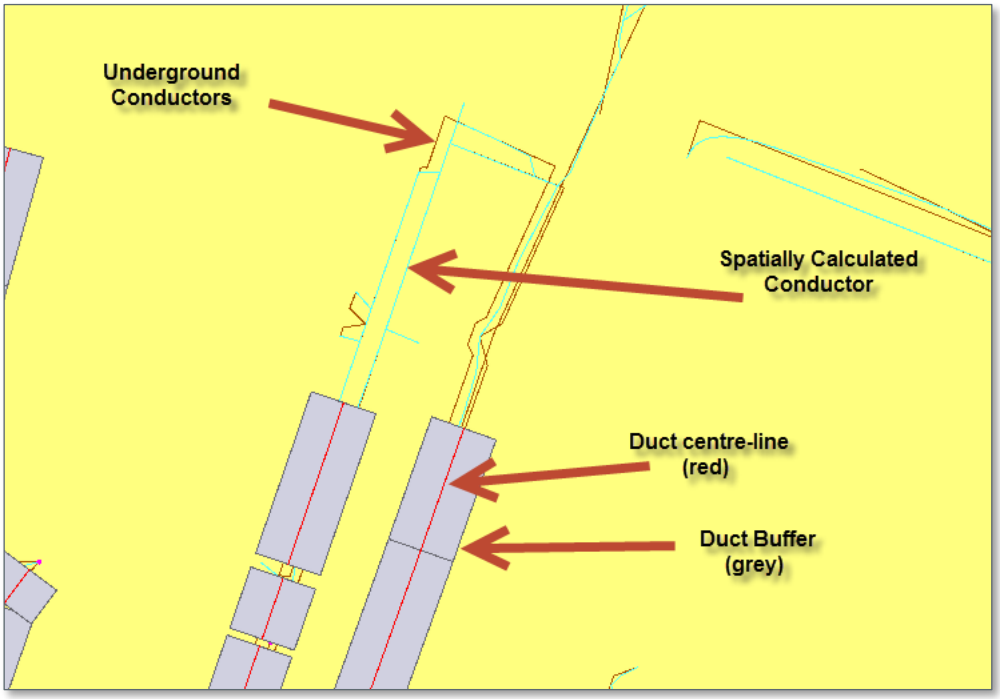
Actual geospatial data was used as the basis for Underground route line length. Underground geospatial data is captured differently to how Overhead geospatial data is captured. Additionally, not all Underground Duct geospatial data is available on Endeavour Energy's GIS system, therefore a mix of Duct 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 initially in consultation with a geospatial vendor.

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.



3.7 Operating Environment Factors



Underground Route Line Length (revised 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 on, the method used for this reporting period 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); and

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.

3.7 Operating Environment Factors

Use of estimated information

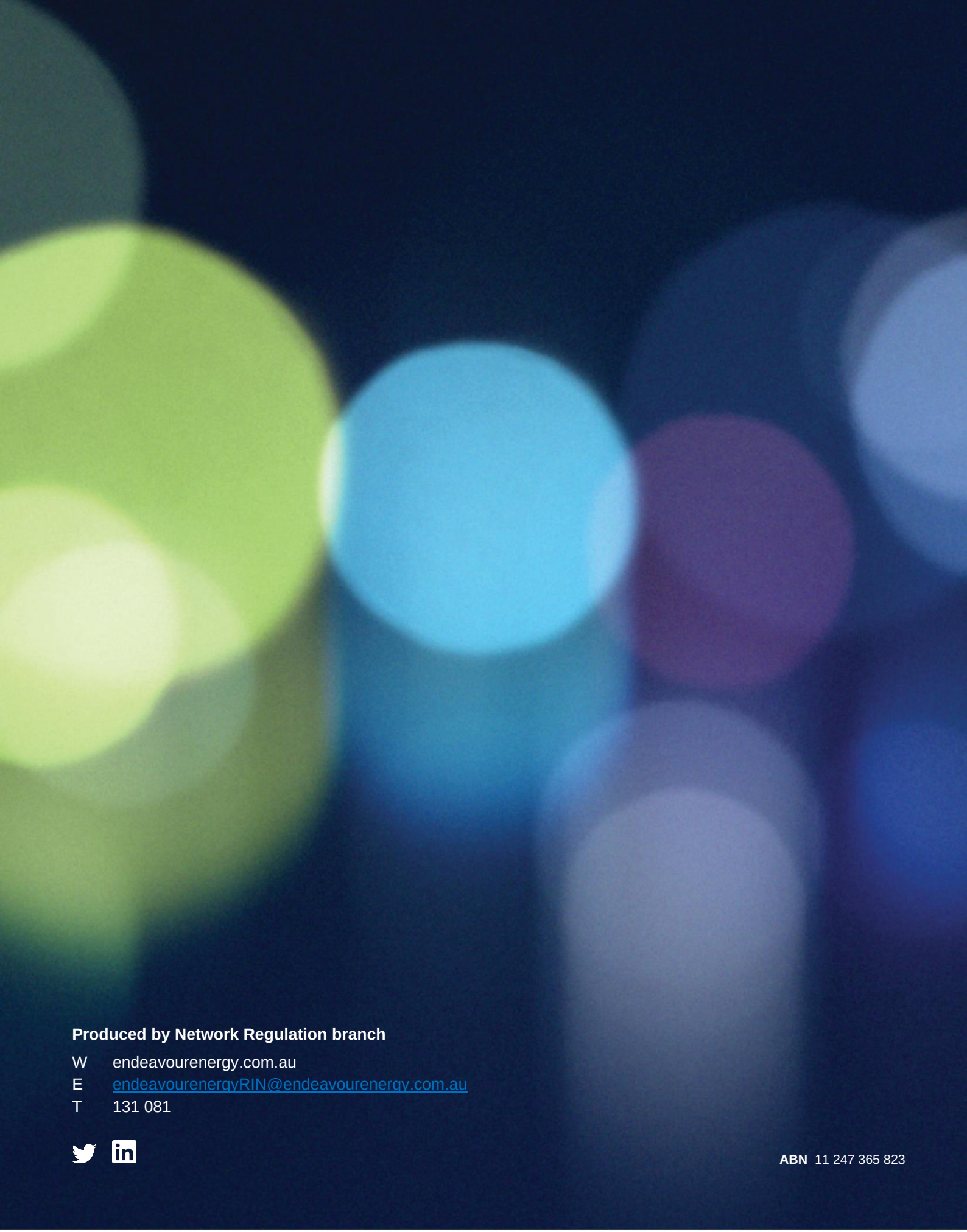
Endeavour Energy has used actual geospatial information to calculate via complex geospatial queries the route line length. It is noted Endeavour Energy GIS systems do not have audit trails nor historical data readily available.

Material accounting policy changes

The spatial report process for this spatial data has not been changed compared to the prior reporting period. 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.



Produced by Network Regulation branch

W endeavourenergy.com.au
E endeavourenergyRIN@endeavourenergy.com.au
T 131 081

ABN 11 247 365 823

Endeavour Energy