Category Analysis RIN

Basis of Preparation
2019-2020

Contents

Purpose

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

This document is Endeavour Energy's Basis of Preparation in relation to the historic information contained within the Regulatory Templates required to be submitted to the AER by 2 November 2020.

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 RIN.

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

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

Structure of this document

The document is structured as follows:

- We outline our general approach to developing our response to the RIN. We identify key systems used to provide data, note issues relating to data quality, and make comments on the reliability of the data for economic benchmarking purposes.
- We set our response to worksheets in accordance with the AER's instructions. We note that Worksheets 1 and 3 and Tables 2.16, 7.1, 7.2 and 7.3 do not require a Basis of Preparation to be provided as they either contain forecast information or require no input material.

General approach

General approach

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

Systems used to provide data

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

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

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

General approach

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

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

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

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

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

Data quality issues

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

Approach to our obligations under the NEL

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

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

Recognition by AER that 'best estimates' are not robust

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

2.1 Expenditure Summary & Reconciliation

2.1 Expenditure Summary and Reconciliation

2.1.1 Standard Control Services Capex

2.1.2 Standard Control Services Opex

2.1.3 Alternative Control Services Capex

2.1.4 Alternative Control Services Opex

Compliance with requirements of the notice

The data presented in tables 2.1.1 to 2.1.4 is consistent with the requirements of the Category Analysis RIN. In particular:

- Total opex and capex reported represents expenditure split into Standard Control Services and Alternative Control Services and reconciles to the amounts reported in the Annual RIN.
- Opex and capex reported in tables 2.1.1 to 2.1.4 reconciles to corresponding amounts reported in tables 2.2 to 2.10 and 4.1 to 4.4.
- The total expenditure for the capex and opex for each service classification is mutually exclusive and collectively exhaustive.
- A “balancing item” is included (where required) to reconcile total capex and opex in tables 2.1.1 to 2.1.4 with total capex and opex reported in the Annual RIN. The balancing items calculated include capex and opex amounts which have either been reported more than once within tables 2.2 to 2.10 and 4.1 to 4.4 or have not been reported at all in tables 2.2 to 2.10 and 4.1 to 4.4.
- A table that contains the calculation of balancing items reported in tables 2.1.1 to 2.1.4 is provided under the “Source of information” section. A summary of each balancing item is set out below:
    - Table 2.1.1 - the items included in the “balancing item” row include those capex items not reported in tables 2.2 to 2.10 and 4.1 to 4.4. In addition, and adjustment is made to remove public lighting capital expenditure which is double counted in tables 2.2 and 4.1.
    - Table 2.1.2 – no balancing items required.
    - Table 2.1.3 – no balancing items required.
    - Table 2.1.4 – the items included in the “balancing item” row include the duplicated costs captured under the “Network Overhead” and “Corporate Overhead” categories which are captured under the “Public Lighting” category.

2.1 Expenditure Summary and Reconciliation

Source of information

Table 2.1.1 - Standard Control Services "Capex"		
Replacement Expenditure	110,221,356	Table 2.2 - Repex (but excludes Public Lighting, as the numb
Connections	35,155,359	Table 2.5 - Connections
Augmentation Expenditure	35,850,851	Table 2.3 - Augex
Non-Network	62,580,403	Output for Dan (Non-system capex: activity 92 + 94
Capitalised Network Overheads	51,899,095	Table 2.10 - Overheads
Capitalised Corporate Overheads	33,197,369	Table 2.10 - Overheads
Metering	-	Table 4.2 - Metering
Public Lighting	-	Table 4.1 - Public Lighting
Balancing Item	93,814,371	See below (cap cons + balancing item)
Total Gross Capex (includes Cap Cons)	**422,718,804**	
Capital Contributions	93,814,371	
Annual RIN - 8.2 Capex	328,904,432	<<< SCS Capex (excl Cap Cont and Disposal)
Check (reconciles to Annual RIN 8.2 Capex)	*0*	
Balancing Items		
Cap Cons	**93,814,371**	Annual RIN Table 8.2 - Customer contributions by
Infrastructure Land	-	Tab: Syst Capex by Project- Filter: PR- Yellow-marke
Switching	-	RAB Capex
Essential Spares	-	RAB Capex
Asset Relocation		Tab: Syst Capex by Project- Filter: AR- Yellow-mark
Reliability (RC and RI; RI=$1.097m)		Data from Andrew
Power Quality		Tab: Syst Capex by Project- Filter: PQ- Yellow-mark
Environmental Enhancement		
Efficiency Programs		Tab: Syst Capex by Project- Filter: EF- Yellow-marke
Metering		RAB Capex
Direct Capitalised Overheads	-	General ledger (TM1 PNL cube)
Switching and direct capitalised overhead allocated	-	
Other (balancing item of other items)	-	Remaining balancing item
Total Balancing Items	**93,814,371**	

Table 2.1.2 - Standard Control Services "Opex"		
Vegetation Management	38,003,487	Table 2.7 - Vegetation Management
Maintenance	40,679,530	Table 2.8 - Maintenance
Emergency Response	27,276,020	Table 2.9 - Emergency Response
Non-Network	66,584,941	Table 2.6 - Non-network
Network Overheads	47,899,458	Table 2.10 - Overheads
Corporate Overheads	6,329,359	Table 2.10 - Overheads
Balancing Item	-	
Total Opex	**226,772,794**	
Check (reconciles to TM1)	*(0)*	
Balancing Items		
Total Balancing Items	-	

Table 2.1.3 - Alternative Control Services "Capex"		
Connections		
Capitalised Network Overheads (inc switching)	1,190,809	
Capitalised Corporate Overheads		
Metering	-	Table 4.2 - Metering
Public Lighting	3,075,255	Table 4.1 - Public Lighting
Fee & Quoted		
Balancing Item		
Total Capex	**4,266,064**	
Check (reconciles to annual RIN)	-	

2.1 Expenditure Summary and Reconciliation

Table 2.1.4 - Alternative Control Services "Opex"		
Connections		
Network Overheads	8,752,145	Table 2.10A - Overheads
Corporate Overheads	20,807,086	Table 2.10A - Overheads
Metering	18,484,567	Table 4.2 - Metering
Public Lighting	20,953,997	Table 4.1 - Public Lighting
Fee & Quoted	26,569,426	Table 4.3 & 4.4 - Fee & Quote Based Services
Balancing Item 1	(29,559,231)	Overheads double counted in 2.10 and 4.* series
Balancing Item 2	-	
Total Opex	**66,007,990**	
Check (reconciles to TM1)	*0*	

Methodology and assumptions

Table	Methodology	Assumptions
2.1.1, 2.1.2, 2.1.3 & 2.1.4	1. Extract expenditure from the Category Analysis RIN templates listed in the source of information above and link to the relevant category in tables 2.1.1 to 2.1.4.	Nil
	2. Identify balancing items by extracting information from the general ledger and/or linking to double counted amounts in the Category Analysis RIN.	Nil
	3. Reconcile the total of each table to the Annual RIN.	Nil

Use of estimated information

All information provided in tables 2.1.1 to 2.1.4 consists of Actual Information (no Estimated Information required).

Reliability of information

All information provided represents information extracted from Endeavour Energy's reporting systems and has been reconciled to reported figures in the Annual RIN. As a result, the information contained in tables 2.1.1 to 2.1.4 is considered to be reliable.

2.1.5 Dual Function Assets - Capex

Endeavour Energy does not have any dual function assets and therefore does not need to complete table 2.1.5.

2.1 Expenditure Summary and Reconciliation

2.1.6 Dual Function Assets - Opex

Endeavour Energy does not have any dual function assets and therefore does not need to complete table 2.1.6.

2.2 Replacement Expenditure

2.2 Replacement Expenditure

2.2.1 Replacement Expenditure, Volumes and Asset Failures by Asset Category and 2.2.2 Selected Asset Characteristics

Compliance with requirements of the notice

Past expenditure and replacement quantities were estimated and provided to comply with the requirements of tables 2.2.1 and 2.2.2.

Source of information

- Installed quantities from Table 5.2 (2019-20);
- Finance expenditure data (June 2020);
- VDA cost estimates (Prepared for 2017 model) with unit cost adjusted to FY20 $;
- Unit cost data provided by Program Development
- Ellipse asset database (Data extracted using Cognos in July 2020);
- Network statistics reports (June 2019 & June 2020);
- GIS; and
- Reset RIN table 2.4.1 (2019 Submission).

Methodology and assumptions

- Past renewal expenditure was categorised into the major categories of table 2.2.1. The category totals were proportioned into the subcategories of table 2.2.1. Proportions were weighted by 2019-20 installed quantities and replacement unit costs from the VDA cost estimates. The VDA cost estimates were updated using cost data provided by Program Development.

- Replacement quantities were calculated by dividing the expenditure derived above by the replacement unit costs from VDA cost estimates.

- Not all line items in the RIN template have a one to one correlation to the line items in the VDA cost estimates. Some weighted averaging was carried out to translate replacement unit costs from VDA cost estimates to the RIN. The replacement unit costs were weighted by total asset quantities. No data has been provided for pole top structures as that data is unavailable. Costs for the replacement of pole top structures are covered under other categories such as “Poles” and “Overhead conductors”.

- Some larger type of asset types have expenditure but no quantities. This is due to the phasing of larger projects. In addition, some miscellaneous expenditures are captured into some categories which are renewal based but do not replace entire assets. In some of these instances, expenditure was proportioned by total population quantity.

- Some quantities were zeroed where it is known that Endeavour Energy does not have a replacement program for that asset type.

- The “Other” major category has been utilised for data relating to Zone & Transmission Substation Assets and Distribution Substation Assets.

2.2 Replacement Expenditure

- Quantities for Urban, Rural Short and Rural Long assets were estimated by applying percentages to total volumes and estimated replacement quantities. The percentages were calculated from feeder lengths and their classifications. Distribution feeder classifications were calculated by EE. Transmission feeder classifications were obtained from the Reset RIN Table 2.4.1).

- The quantities for the replacement of overhead conductors by material type were estimated from the reductions of conductor types from 2018-19 to 2019-20. The reduction quantities were categorised into conductor types and used to calculate the proportional percentages of conductor materials that have reduced. These percentages were applied to the total overhead conductor replacement quantities. (Conductor type data was based on Network Statistics)

- The total transformer MVA replaced was estimated by multiplying replacement quantities and an average MVA rating for the transformer category.

- Total MVA disposed was assumed to be equal to the Total MVA replaced.

- For Staking of a wooden pole:
  - Total cost of pole staking was obtained from pole staking invoices.
  - Pole staking quantity was obtained from closed work orders from Ellipse.
  - The quantity of staked pole failures was obtained by applying the current failure rate for wooden poles to the total of in-service staked poles. The resulting quantity was divided between the most common staked poles.

Use of estimated information

All replacement costs are actuals at a high level. Due to the way that expenditure is accounted for, estimation is required to proportion the costs to sub category levels.

Reliability of information

The information is principally based on Ellipse data, GIS data and corporate finance reports available at the time of preparation.

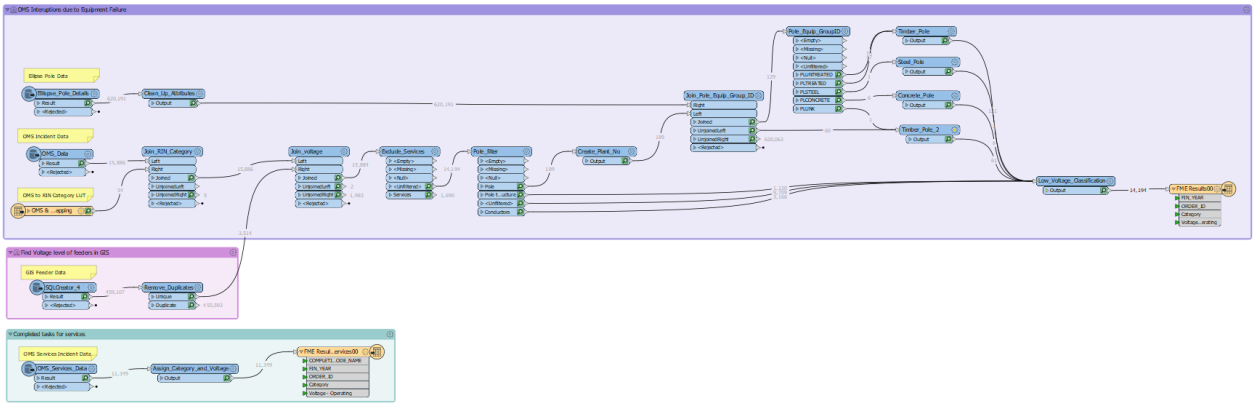
2.2 Replacement Expenditure

Asset Failures

The asset failure statistics were collected based on the definition of asset failure provided below from the AER:

Asset failure (repex)	*The failure of an asset to perform its intended function safely and in compliance with jurisdictional regulations, not as a result of external impacts such as:* *• extreme or atypical weather events; or* *• third party interference, such as traffic accidents and vandalism; or* *• wildlife interference, but only where the wildlife interference directly, clearly and unambiguously influenced asset performance; or* *• vegetation interference, but only where the vegetation interference directly, clearly and unambiguously influenced asset performance.* *Excludes planned interruptions.*

The software FME was the tool used to extract the data for this report and the workflow used within this software is shown below.



The data was collected from the Endeavour Energy outage management system (OMS) for the outages where the cause was attributed to the following:

1. Defective equipment, and;
2. Adverse weather (included due to ambiguousness of vegetation influence during the weather event).

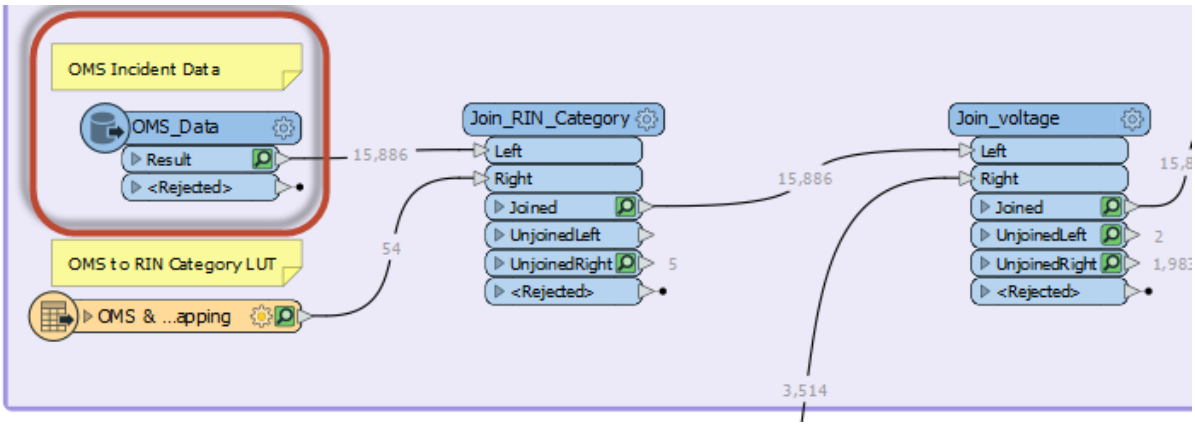
The causes that were **not** considered and filtered out were:

2.2 Replacement Expenditure

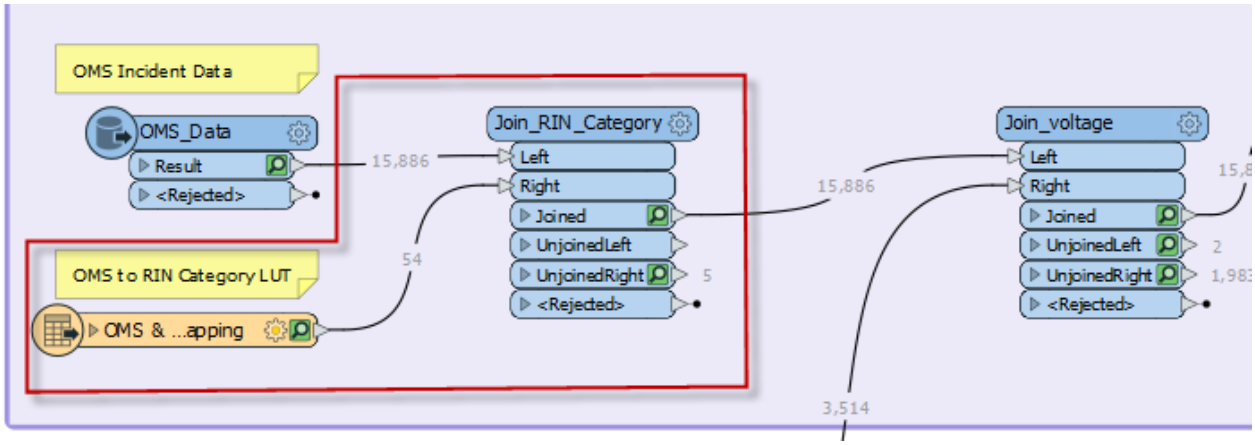
1. Foreign Interference
2. Tree Contact
3. Unknown
4. Human Element
5. Other Causes
6. Adverse environment (most commonly used for bushfire damage)

All outages that were part of an “extreme or atypical weather event” where customer minutes do not contribute to the organisations SAIDI were **removed** from the report.

The first query is designed using SQL to return all verified interruptions from the “POIE_REPORT_INTERRUPTION_V” table in the OMS oracle database and joins the damage descriptions from “POIE_REPORT_DAMAGE_V” to each interruption.



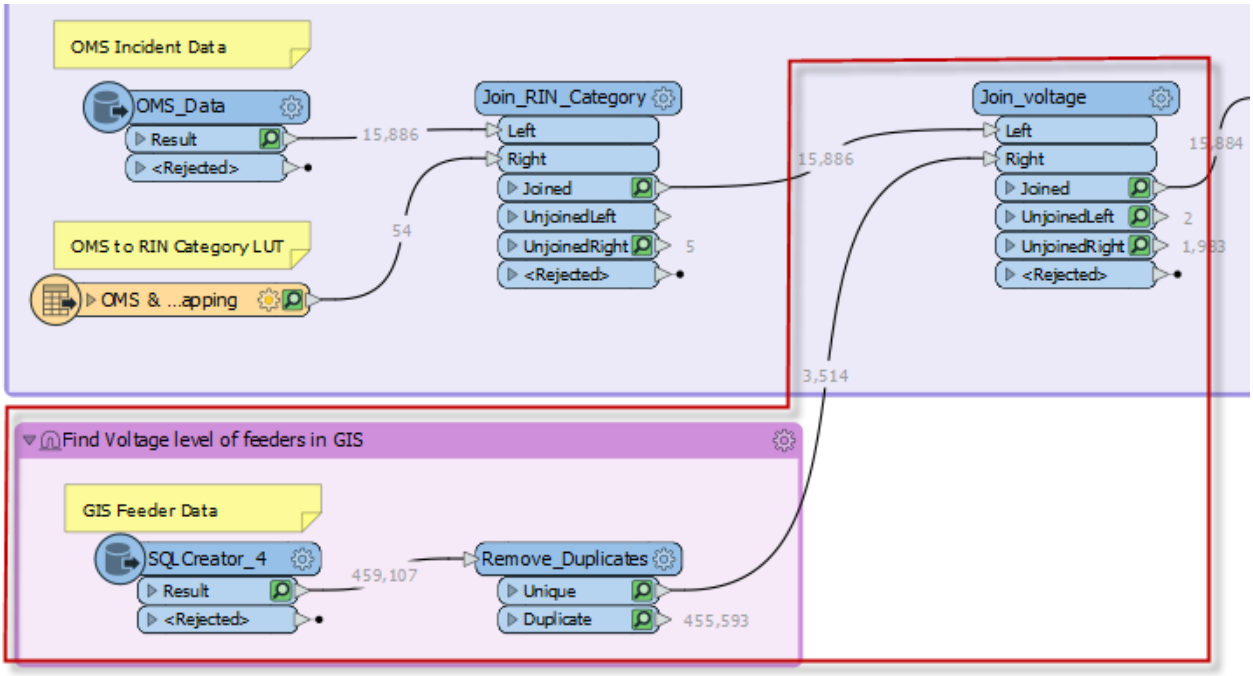
The damage descriptions were then mapped to the corresponding RIN asset category used in the report format by joining the Excel mapping table to the OMS data.



2.2 Replacement Expenditure

Every OMS outage contains the feeder name that the outage was recorded on however the operating voltage of that feeder is not stored in OMS.

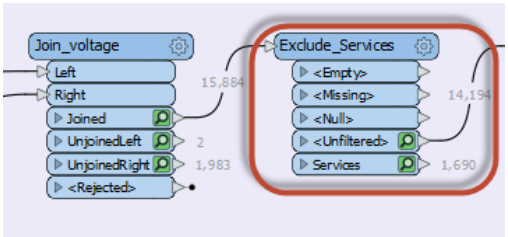
Another SQL query was written to return all feeders stored in GIS and their associated operating voltages, then this was merged back into the OMS list previously extracted.



The resulting table now contains every interruption, the asset category, the voltage level of the feeder, and the financial year in which it occurred.

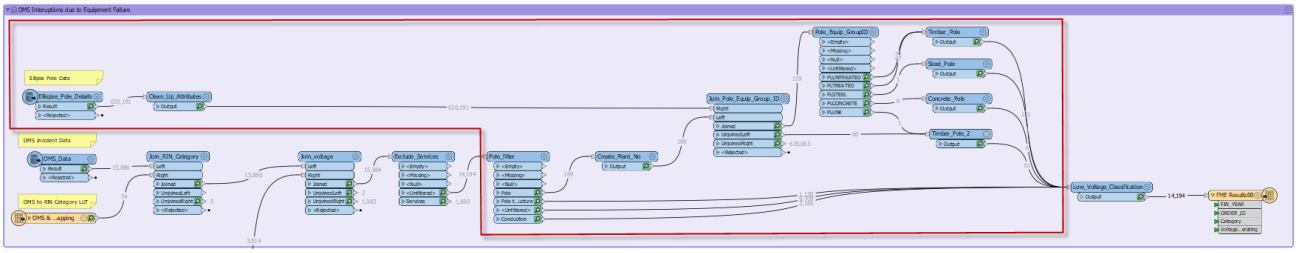
Customer services are unique and are not completely recorded in the interruptions table as the failure of a service does not always result in an interruption at a feeder level.

Therefore, services were removed from the interruptions list prior to being exported to an Excel spreadsheet.

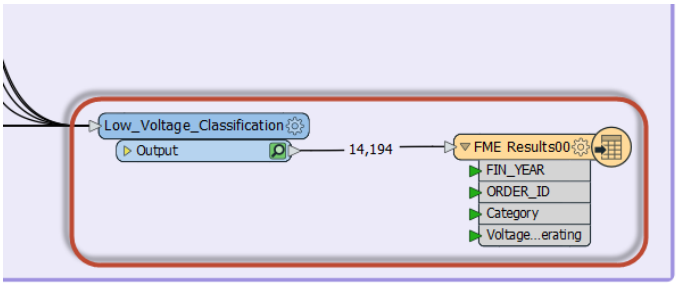


Poles are then mapped to Endeavour Energy's Ellipse database to determine their type using the "Equipment Group ID". Where a poles type is unknown, it has been assumed to be timber.

2.2 Replacement Expenditure



The operating voltage is then overridden to low voltage for all assets where the “network classification” from OMS database states it is low voltage and the results are exported.



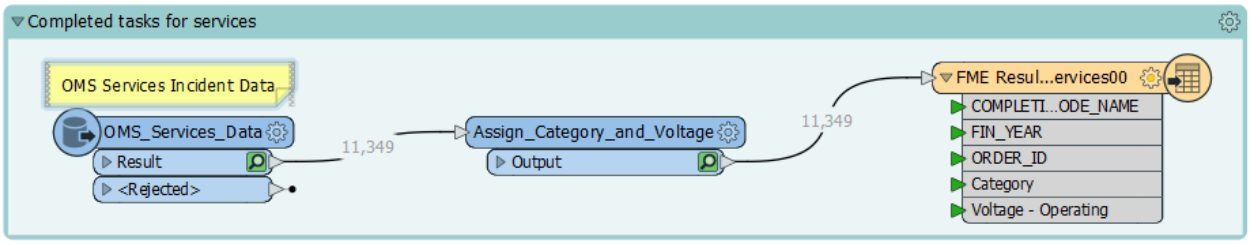
The services information was collected using the completion codes registered by Emergency Service Officers when responding to a customer call specific to their property in OMS table “POIE_ORDER_TASK_V”.

The codes cover a range of jobs for services. The excerpt of code below shows the included codes in purple and the excluded codes in green.

```
and t.completion_code_name IN (
 '441 - Single / Phase Service Down Made Safe'
,'442 - Multi / Phase Service Down Made Safe'
,'443 - RDXING Service Down Made Safe'
,'444 - Neutral Down Made Safe'
,'445 - Service Replaced, Not Connected'
--,'446 - Service Mains To Be Retensioned'
--,'447 - Region To Remove Branch From Service Mains'
--,'448 - Untwisted Service Mains, No Follow Up Required'
,'449 - Service Mains Replaced, No Follow Up Required')
```

The results of this query were then exported to another excel spreadsheet.

2.2 Replacement Expenditure



The results of each table were then categorised into the right formats and entered into the report.

Assumptions made in the reporting tables due to a lack of granularity in data:

1. Services – All services failures data was assumed to be Residential - simple type
2. Transformers – Both pole mounted, and pad mounted transformers were assumed to be of a size between 60kVA and 600kVA Multiple phase as this is the most common size.
3. Poles – Unknown pole types are assumed to be timber.

2.3 Augex Data

2.3 Augex Data

2.3.1 Augex Asset Data – Subtransmission Substations, Switching Stations and Zone Substations

Compliance with requirements of the notice
The information provided on this work sheet is consistent with the requirements of this Notice. Where possible, actual costs and values have been used and in areas where individual work orders would need to be obtained and analysed, estimates have been made as outlined below.

Source of information
Project information has been obtained from the following sources:

- Ellipse.
- Finance

Methodology and assumptions
The methodology used to complete table 2.3.1 is outlined below:

- A list of projects that were financially closed off in Ellipse in the 2019-20 financial year was obtained from the Project and Programs Group. The list was scanned for major projects. For the 2019-20 financial year, it was determined that three augmentation major projects (PR110, PR673, and PR750) were closed off.

- The worksheet used in previous RINS was populated with data obtained from Ellipse for the purpose of determining the capital spend on substations and lines within the financial year 2019-20 for the purpose of populating Table 2.3.4 as described below.

Use of estimated information
Nil.

Reliability of information
Nil.

2.3.2 Augex Asset Data – Subtransmission Lines

Compliance with requirements of the notice
The information provided on this work sheet is consistent with the requirements of this Notice. Where possible, actual costs and values have been used and in areas where individual work orders would need to be obtained and analysed, estimates have been made as outlined below.

Source of information
Project information has been obtained from the following sources:

- Ellipse.
- Finance

2.3 Augex Data

Methodology and assumptions

The methodology used to complete table 2.3.1 is outlined below:

- A list of projects that were financially closed off in Ellipse in the 2019-20 financial year was obtained from the Project and Programs Group. The list was scanned for major projects. For the 2019-20 financial year, it was determined that one augmentation major projects (PR110) were closed off.

- The worksheet used in previous RINS was populated with data obtained from Ellipse for the purpose of determining the capital spend on substations and lines within the financial year 2019-20 for the purpose of populating Table 2.3.4 as described below.

Use of estimated information

Nil.

Reliability of information

Nil.

2.3.3 Augex Asset Data – HV/LV Feeders and Distribution Substations

Compliance with requirements of the notice

This section is intended to demonstrate how the information provided is consistent with the requirements of this notice.

Table 2.3.3 – Descriptor Metrics displays the following over the 2019-20 period:

- The quantum of assets added in the HV feeder category (both underground and overhead)
- The quantum of assets added in the LV Feeder category (both overhead and underground)
- The quantum of assets added in the Distribution substation category (indoor, ground and pole mounted)
- The quantum of assets upgraded in the HV feeder category (both underground and overhead)
- The quantum of assets upgraded in the LV Feeder category (both overhead and underground)
- The quantum of assets upgraded in the Distribution substation category (indoor, ground and pole mounted)

Table 2.3.3 – Cost Metrics displays the total costs of the above activities for the 2019-20 financial year expressed in 2019-20 dollars.

Source of information

Expenditure information for the projects associated with tables 2.3.3 has been sourced from Ellipse, Finance and DARRTS.

HV feeder project cost information was obtained from the financial data contained within the Ellipse system associated with the distribution projects that were completed within the 2019-20 financial year. It includes costs for those items that were contracted to external accredited designers and constructors. The asset length data for LV feeders was calculated by applying suitable unit rates to the costs incurred by the

2.3 Augex Data

projects in the 2016-17 year. The asset length data for HV feeders was obtained from the DARRTS (Distribution Augmentation, Reliability and Refurbishment Tracking System) database.

Distribution Substation and LV feeder information was also obtained from the Ellipse database from the following categories;

- LV001 – Overloaded distribution Substation uprates: Captures costs associated with upgrades to distribution substation transformers based on maximum demand readings.
- LV002 – Quality of supply reactive projects: Captures costs associated with responding to customer complaints about low volts, frequent loss of supply due to LV overloads and overvoltage issues. Rectification may involve the installation or upgrade of distribution substations and LV overhead and underground feeders.
- LV003 – Quality of Supply planned projects: This is reserved for when transformers are not able to be upgraded in LV001 due to capacity constraints and a new substation at another location needs to be established. The scope of work may include installing new pole mount or ground mount subs and new LV overhead or underground feeders.
- LV004 – Low voltage system augmentation: This is used to augment mainly LV overhead feeders, for example upgrading undersized LV conductors due to overloading or voltage drop issues.
- LV005 – Distribution Substation Augmentations - Ground Mounted. The scope of work may include installing new pole mount or ground mount subs and new LV overhead or underground feeders

It should be noted that Table 2.3.3 does not contain expenditure and quantities relating to network augments or upgrades associated with customer connections.

Methodology and assumptions

The financial details and the calculated length data was gathered on a project to project basis for HV feeders. The length and category of each line item included in each project in DARRTS was used to determine the total “Units Added” and Units Upgraded” in table 2.3.3 – Descriptor Metrics. The total cost of each project was then apportioned to the Overhead and Underground categories according the length of the line items included in the project. The costs under each category for the all the projects was then summed to produce the results for table 2.3.3 – Cost Metrics.

Any project that was driven by fault exceeded conductors was not included in the costs represented in Table 2.3.3. Note all projects have been included irrespective of whether they are material or non-material, i.e., above or below $500,000.

For distribution transformers and LV feeders, the costs associated with each category (LV001 – 005) were allocated to the following 5 categories by applying the historical ratios for the split of expenditure as shown by the following formulae. The lengths/quantities were calculated using typical per unit rates and applying them to the expenditure in each of the 5 categories.

2.3 Augex Data

LV feeder augmentations - overhead lines:	D+(B+C)*0.1
LV feeder augmentations - underground cables:	(B+C)*0.4
Distribution substation augmentations - pole mounted ($000's):	0.54*(A+(B+C)*0.4)
Distribution substation augmentations - ground mounted ($000's):	0.44*(A+(B+C)*0.4)+E
Distribution substation augmentations - indoor ($000's):	0.02*(A+(B+C)*0.4)
LV feeder non-material projects:	T – [(i)+(ii)+(iii)+(iv)+(v)]

where:
A=LV001, B=LV002, C=LV003, D=LV004, E=LV005, T=A+B+C+D

Use of estimated information
Apart from the assumptions mentioned above, no other estimated information was used in this section.

Reliability of information
The base data presented in Table 2.3.3 is resident in Endeavour Energy's Ellipse system which provides both financial tracking and project lists. Detailed analysis of the project lists within the Distribution Works Program were also utilised to provide more detailed understanding of the work undertaken, this was used to assign a work category.

The data is therefore considered to be reliable.

2.3.4 Augex Data – Total Expenditure

Compliance with requirements of the notice
The information is obtained from the available data in Endeavour Energy.

Source of information
The financial information was sourced from the Ellipse database, Finance and DARRTS.

Methodology and assumptions
The expenditure in 2019-20 dollars for the following rows was derived as follows:

- Subtransmission Substations, Switching Stations and Zone Substations: The basis of preparation for table 2.3.1 allocated expenditure according to substations or lines. All expenditure occurring in 2019-20 for the substations category was summated from the same worksheet used to derive data for table 2.3.1.
    - Total Subtransmission substations costs plus
    - Total Land Acquisition FY20 plus
    - Total PQ001 to PQ004 subs cost

2.3 Augex Data

- Subtransmission Lines: The basis of preparation for table 2.3.1 allocated expenditure according to substations or lines. All expenditure occurring in 2019-20 for the
  - Total Subtransmission Lines Plus
  - Total DU program to Subtransmission Lines Plus
  - 20% total AR program to Subtransmission Lines
- subtransmission lines category was summated from the same worksheet used to derive data for table 2.3.2.
- HV Feeders: From table 2.3.3 – Descriptor Metrics.
- HV Feeders - Land Purchases and Easements: No land purchase cost captured as most.
- HV feeders are on State land or on road reserves.
- Distribution Substations: From table 2.3.3 – Cost Metrics.
- Distribution Substations - Land Purchases and Easements: Cost is estimated only for any added ground substations that require land easement (see below). Not required for pole mount or indoor substation.
- LV Feeders: From table 2.3.3 – Cost Metrics.
- LV Feeders - Land Purchases and Easements: No land purchase cost captured as most LV feeders are on State land or on road reserves.
- Other Assets: Nil

Use of estimated information

A land purchase and easement cost is paid only for newly added ground mount substation. It is very time consuming to search the individual cost of these easements, thus an estimate cost of $12,000 (includes land purchase, survey and legal cost) was used for each ground mount substation added as shown in Table 2.3.3 – Cost Metrics. An estimated cost was provided by the Network Property section.

Reliability of information

The information is based on input from other tables.

2.5 Connections

2.5 Connections

2.5.1 Descriptor Metrics

Compliance with requirements of the notice

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

Important Note

Since 2017-2018 onwards Endeavour Energy had increased its funding of Assets via a capital uplift program. This in turn will see an increase in the Substation and HV cables funding for the future. Nov 2019 saw a funding change back to original funding where Endeavour funds for Transformers only.

Source of information

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

- Finance and Compliance Division – general ledger, fixed asset register and customer data.
- Network Connections Branch – Customer connection, NOSW information and SAMP 10 year forecast of lots serviced.
- Network Connections Expenditure PIP 9 forecast model
- MVA data for number of connections

Methodology and assumptions

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

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

- Actual customer numbers by class and forward estimate.
- Fixed asset register and general ledger for financial details by class.
- Equipment Register for validation of transformer numbers and size.
- Asset Valuation Sheet (AVS) used for the estimation of UG and OH circuit lengths.
- Notification of Service Work (NOSW) Endeavour Energy form number FPJ4503, sample used to determine connection types, customer proportions and connection methodology. The data was collated from the eNOSW. This data was used to assist in proportioning the connection types for residential, industrial/commercial and subdivision and as a subset the embedded generator connections that occur to an existing network connection.
- Developed estimation ratios for each connection class and type to fill template requirements.

2.5 Connections

- Financial Report actuals and forward estimates.
- Strategic Asset Management Plan (SAMP) 10year financial data.
- ENOSW data to determine residential and subdivision customer proportions.
- Network Connections Expenditure PIP 9 forecast model.

Use of estimated information

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

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

a) Determination of customer numbers in Residential and Subdivision categories – The Company has the customer numbers data contained Domestic and Controlled Load customers, however, the customer numbers were not available in the domestic and subdivision categories. To determine the number of customers in each domestic and subdivision category, eNOSW data for new connections 2019-2020 was used to develop the proportions for the required categories and then applied the proportion for residential and subdivision customers.

b) Split of OH and UG connections – This estimation was applied to connections in the Residential, Commercial/Industrial and Subdivision categories of template 2.5.1. Whilst historical customer data was maintained by the Company in the three major reporting categories it did not naturally break into overhead and underground connections. We a have used ENOSW data for new connections for 2019-2020 % for UG and OH split. From this analysis, assumptions were developed and applied to the actual data provided in the customer numbers document. These numbers were then included in the reporting template. The process applied used the year on year customer number change, split the numbers into the required categories and then applied the proportion for the OH and UG connection split.

c) Circuit km added to the network – The Company did not have available the data that would allow the ready completion of the template for these categories for HV and LV connection. Financial data was available from the financial reports, for both overhead and underground connections, however, route length was not available. To derive these lengths, the current Asset Valuation Sheet (AVS) was used to develop typical costs for standard construction types per km for both HV and LV overhead and underground installations. The financial from the AVS data was then used to derive route lengths for each connection type. The AVS 15b data was used to calculate the preceding year's conductor length data as they still related 2019-20 for cable cost.

2.5 Connections

d) Cost per Lot has been obtained by calculation using the SAMP financial data and the Number of new customers in Subdivision.

Reliability of information

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

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

Information not included in the Template

The following information has not been included in the template:

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

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

Embedded Generation – Distribution Substations and Circuit Augmentation

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

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

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

2.5.2 Cost Metrics by Connection Classification

Compliance with requirements of the notice

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

Source of information

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

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

2.5 Connections

The data included in template 2.5.1 using the above sources has been used to complete the relevant parts of template 2.5.2. For example, the number of simple residential connections included in table 2.5.2 for 2019-2020 is the sum of the OH and UG connections from line numbers 1 and 2 of the Residential category in table 2.5.1.

Methodology and assumptions

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

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

- Residential – All residential connections are simple connections to existing LV infrastructure allowing connection of up to 100 amps single phase or 63 amps three phase.
- Commercial/Industrial – All commercial/industrial connections are complex, customers are connected at LV and there is some upstream network works required.
- Subdivision – All subdivision connections are complex with HV extension to the network to allow connections to be completed at LV to developed infrastructure.
- Embedded Generation – All embedded generation less than 5kW single phase is a simple connection made to an existing network connection for the residential load at the connected premises.

Endeavour Energy funded works Capital uplift- Forecast

From 2017-2018 onwards the company has decided to uplift capital with HV cables and packaged substation.

Assumption Capital Uplift			
	HV Cables	Substation	
ULL			
UIL			
UIS			
UCS			
UCL			Industrial Commercial
UML			
NRL			Residential
NRS			
URS			
UMS			Subdivision

Historical data standard Control – Capital Contribution

The data was sourced from the Non-cash capital contribution Asset Register provided by Finance.

2.5 Connections

All assets were included in the basis of the prep including land.

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

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

Use of estimated information

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

Reliability of information

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

Information not included in the template

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

2.6 Non-Network Expenditure

2.6 Non-Network Expenditure

2.6.1 Non-network expenditure

Service Subcategory
IT and Communications

Compliance with requirements of the notice

The data presented in the tables contained in table 2.6.1 is consistent with the definition of Non-network IT and Communications Expenditure per the RIN definitions contained in Appendix F. In particular:

- The data presented in table 2.6.1 reflects IT & Communications opex and capex expenditure. The data is reported by Asset Category in accordance with the RIN definitions contained in Appendix F.
- The non-network IT & Communications opex and capex listed in table 2.6.1 is all non-network expenditure directly attributable to IT and communications assets including replacement, installation, operation, maintenance, licensing, and leasing costs but excluding all costs associated with SCADA and Network Control Expenditure that exist beyond gateway devices (routers, bridges etc.) at corporate offices.
- The opex data presented in tables 2.6.1 represents the total operating expenditure including labour, overtime, plant, materials, maintenance, other contractors, professional services and other operating expenses pertaining to all non-network IT & Communications expenditure. Further, Maintenance includes Computer Expenses (expense element 3600), Telephone-Land Line Lse/Purch/Call Chrgs (expense element 3610), Telephone-Employee Rembrs Call Chrg/Rent (expense element 3615) and Telephone-Mobile Phone Lse/Purch/Call Chr (3616).
- The Capex data presented in tables 2.6.1 represents the total operating expenditure including labour, overtime, plant, materials, maintenance, other contractors, professional services and other operating expenses pertaining to all non-network IT & Communications expenditure.
- The non-network IT & Communications opex and capex in table 2.6.1 is directly attributable to this expenditure category in this regulatory template. For the purposes of table 2.6.1 we have reported all capex and/or opex as Direct Costs as required, irrespective of them also being classified as Corporate Overheads or Network Overheads or other capex or opex categories.

Source of information

The information used to populate the tables contained in section 2.6.1 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.

Set out in the table below are the specific cubes used to obtain the required information for the tables in section 2.6.1, along with a description in relation to the use of the cube by Endeavour Energy:

2.6 Non-Network Expenditure

Table	TM1 Cube	Description
2.6.1	PNL cube	The PNL cube contains General ledger information sourced from Ellipse (GL system) based on Endeavour's chart of accounts.
2.6.1	Project Reporting cube	The Project Reporting cube contains General ledger information sourced from SQL server database which is extracted nightly from Ellipse (GL System).

In addition, information from Work orders was utilised in section 2.6.1 which is extracted directly from MS Access query against the SQL server database which is extracted nightly from Ellipse. Query is run on parameters specified to extract the data.

Methodology and assumptions

The following table sets out the methodology applied to calculate the required data for the IT and Communications sections in table 2.6.1:

Table	Methodology	Assumptions
2.6.1 (opex)	1. Extract IT & Communications Opex data from the TM1 PNL cube for Information Communication & Technology Division. 2. Extract IT & Communications Maintenance data from the TM1 PNL cube for all Divisions (excluding Information Communication & Technology Division). 3. Extract Work order data from MS Access query, parameters org unit Communication & Technology Division. 4. Asset category allocation of above data based on RIN definitions. 5. Reconcile Asset Category to TM1 PNL cube data extracted above. 6. Extract standard control only component by calculating the average opex standard control % of each branch associated with these non-network categories	Table 2.6.1 reflects historic opex figures stated in nominal dollars
2.6.1 (capex)	1. Extract Capital Expenditure data from the TM1 PNL cube for all Org Units across Endeavour coded to IT Capex Sub-Activities:	Re-current refers to capital expenditures to Maintain Capability; example

2.6 Non-Network Expenditure

	• WD – WIP – IT&T Hardware • WE – WIP – IT&T Software • WF – WIP – IT&T Infrastructure • 35 - Other IT&T 2. Extract data from TM1 cube Project Reporting against above Sub-Activities and allocate asset category against projects per RIN definition. 3. Extract standard control only component by reconciling to annual RINs	includes: applications and server refresh. Non-recurrent refers to capital expenditures to Develop New Capabilities and New business enabling technologies, examples include: Transformation, Strategic Re-engineering, Process Re-engineering, CRM, Mobility and AMI. Table 2.6.1 reflects historic opex figures stated in nominal dollars

Use of estimated information

While Endeavour Energy made an assumption in order to allocate the IT and Communications expenditure into the Asset Categories in the RIN templates, the opex and capex in table 2.6.1 reconciles to the annual RIN (as outlined above), it has not used estimated Information as provided in the definitions with the Regulatory Information Notice.

Reliability of information

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

Service Subcategory

Motor Vehicles

Compliance with requirements of the notice

The data presented in the tables contained in table 2.6.1 is consistent with the definition of Motor Vehicles Expenditure per the RIN definitions contained in Appendix F. In particular:

- The Opex data presented in tables 2.6 represents the total operating expenditure including leasing, fuel, registration, CTP insurance, self-insurance, inspections, labour, materials, maintenance, contractor and other operating expenses pertaining to all Motor Vehicle expenditure.
- The Capex data presented in tables 2.6 represents the total capital expenditure pertaining to all Motor Vehicle expenditure including procurement of motor vehicles, labour, materials and major overhaul costs.
- The non-network Motor vehicle opex and capex in table 2.6.1 is directly attributable to this expenditure category in this regulatory template. For the purposes of table 2.6.1 we have reported

2.6 Non-Network Expenditure

all capex and/or opex as Direct Costs as required, irrespective of them also being classified as Corporate Overheads or Network Overheads or other capex or opex categories.

Source of information

The information used to populate the tables contained in section 2.6.1 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.

Table	TM1 Cube	Description
2.6.1	PNL cube	The PNL cube contains General ledger information sourced from Ellipse (GL system) based on Endeavour's chart of accounts.

In addition, information was also sourced from:

- The Ellipse Equipment register was utilised in section 2.6.1 which was utilised to extract vehicle numbers and is extracted directly from MS Access query against the SQL server database which is extracted nightly from Ellipse. Query is run on parameters specified to extract the data; and
- Fuel reports provided by suppliers were utilised to calculate kilometres travelled.

Methodology and assumptions

The following table sets out the methodology applied to calculate the required data for the motor vehicles sections in table 2.6.1:

Table	Methodology	Assumptions
2.6.1 (opex)	1. The Opex data presented in table 2.6.1 was sourced from TM1 through the Fleet org units below which contain all motor vehicle expenditure. • S750 – Fleet Management • S751 – Fleet Operations • S752 - Vehicle Workshops • S753 – Fabrication Workshops	Motor vehicle leasing, fuel, registration and CTP insurance costs by vehicle type have been maintained since Endeavour started leasing vehicles in December 2009, thus allowing the classification of costs. Fleet Labour, materials, contractors and other costs are not captured by vehicle type hence was apportioned

2.6 Non-Network Expenditure

		based on advice from the Fleet manager.
2.6.1 (capex)	1. The Capex data presented in table 2.6.1 was sourced from TM1 through org unit S350 – Fleet Capital	

Use of estimated information
The opex and capex in table 2.6.1 reconciles to the annual RIN (as outlined above), it has not used estimated Information as provided in the definitions with the Regulatory Information Notice.

Reliability of information
All historical information provided represents Actual Information extracted from Endeavour Energy's reporting systems, however assumptions were made in order to classify the data into Asset Categories. As a result, the information contained in the tables in section 2.6.1 is considered to be reliable.

Service Subcategory
Buildings & Property

Compliance with requirements of the notice
The data related to buildings and property expenditure presented in table 2.6.1 is consistent with the requirements of the Category Analysis RIN. In particular:

- The opex and capex reported relates to expenditure directly attributable to non-network buildings and property assets including the replacement, installation, operation and maintenance of non-network buildings, fittings and fixtures. It includes expenditure related to real chattels (e.g. interests in land such as a lease) but excludes expenditure related personal chattels (e.g. furniture) that is reported under non-network other expenditure.
- The opex and capex reported represents total expenditure including labour, plant, property, taxes, materials, maintenance, contractor and other expenses pertaining to all non-network building and property expenditure;
- The opex and capex reported in table 2.6.1 is directly attributable to this expenditure category in this regulatory template. For the purposes of table 2.6.1, Endeavour Energy have reported all capex and/or opex as Direct Costs as required, irrespective of them also being classified as Corporate Overheads or Network Overheads or other capex or opex categories.

Source of information
Opex
Buildings and property opex data in table 2.6.1 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.

2.6 Non-Network Expenditure

Table	TM1 Cube	Description
2.6.1	PNL cube	The PNL cube contains General ledger information sourced from Ellipse (GL system) based on Endeavour's chart of accounts.

Capex

The information used to populate buildings and property capex data in table 2.6.1 was extracted directly from Endeavour Energy's general ledger (Ellipse). All non-system capex transactions for the financial year were extracted directly from Ellipse through the use of linked access database.

Methodology and assumptions

The following table sets out the methodology applied to calculate the required data for non-network buildings and property expenditure reported in table 2.6.1:

Table	Methodology	Assumptions
2.6.1 (opex)	1. The Opex data presented in table 2.6 was sourced from TM1 through the Property Services org units below which contain all the non-network buildings and property expenditure • S200 - Facilities, Business & Information Support • S220 - Facilities Support - FSC • S230 - Facilities Support - Office Accommodation • S500 - Security Management • S510 - Security Locking • S210 - Property Portfolio Management • S300 - Fleet & Property Management 2. Only 50% of S300 costs were allocated to Buildings & Property expenditure as this org unit contains the Property & Fleet branch management costs which are split between Property & Fleet.	
2.6.1 (capex)	1. All non-system capex transactions for the financial year were extracted from the general ledger through an access database query (all activity 102 transactions); 2. Those transactions relating to non-network buildings and property expenditure were identified via the sub-activity assigned to the transaction. Endeavour Energy uses sub-activity WC to identify expenditure on non-network buildings and property;	None.

2.6 Non-Network Expenditure

	3. The standard control component of each transaction was identified by applying asset allocation drivers used in the preparation of the Annual RIN; 4. The total standard control component of non-network buildings and property was calculated and reported in table 2.6.1. It should be noted that the non-network buildings and property capex reported in table 2.6.1 reconciles to the non-network buildings and property capex reported in the Annual RIN.	

Use of estimated information

Endeavour Energy has not used Estimated Information, as defined in the RIN Instructions & Definitions, in reporting buildings and property expenditure in table 2.6.1.

Reliability of information

All information provided represents Actual Information extracted from Endeavour Energy's reporting systems and reconciles to non-network building and property expenditure reported in the Annual RIN. As a result, the buildings and property expenditure reported in table 2.6.1 is considered to be reliable.

Service Subcategory

Other

Compliance with requirements of the notice

The data related to other non-network expenditure presented in table 2.6.1 is consistent with the requirements of the Category Analysis RIN. In particular:

- The opex and capex reported relates to expenditure directly attributable to the replacement, installation, maintenance and operation of non-network assets, excluding Motor Vehicle assets, Building and Property assets and IT and Communications assets and includes:
    - Non-road registered motor vehicles; non-road motor vehicles (e.g. forklifts, boats etc.);
    - mobile plant and equipment; tools; trailers (road registered or not);
    - elevating work platforms not permanently mounted on motor vehicles; and
    - mobile generators.
- The opex and capex reported represents total expenditure including labour, plant, property, taxes, materials, maintenance, contractor and other expenses pertaining to all non-network building and property expenditure;
- The opex and capex reported in table 2.6.1 is directly attributable to this expenditure category in this regulatory template. For the purposes of table 2.6.1, Endeavour Energy have reported all capex and/or opex as Direct Costs as required, irrespective of them also being classified as Corporate Overheads or Network Overheads or other capex or opex categories.

2.6 Non-Network Expenditure

Source of information

Opex

Endeavour Energy has not identified any opex incurred during the financial year which meets the definition of non-network other expenditure.

Capex

The information used to populate non-network other capex data in table 2.6.1 was extracted directly from Endeavour Energy's general ledger (Ellipse). All non-system capex transactions for the financial year were extracted directly from Ellipse through the use of linked access database.

Methodology and assumptions

The following table sets out the methodology applied to calculate the required data for non-network other expenditure reported in table 2.6.1:

Table	Methodology	Assumptions
2.6.1 (capex)	1. All non-system capex transactions for the financial year were extracted from the general ledger through an access database query (all activity 102 transactions); 2. Those transactions relating to non-network other expenditure were identified via the sub-activity assigned to the transaction. Endeavour Energy uses sub-activity WG to identify expenditure on furniture fittings, plant and equipment and WH to identify expenditure on motor vehicles (a subset of which meets the definition of non-network other expenditure); 3. For the non-system capex expenditure on motor vehicles, those transactions relating to non-road registered motor vehicles, non-road motor vehicles (e.g. forklifts, boats etc.) and mobile plant and equipment were identified. This was performed using the assigned asset class for unregistered plant and information provided by Fleet in relation to the type of equipment purchased (i.e. bobcats, trailers etc); 4. The standard control component of each transaction was identified by applying asset allocation drivers used in the preparation of the Annual RIN; 5. The total standard control component of non-network other capex was calculated and reported in table 2.6.1.	None.

2.6 Non-Network Expenditure

Use of estimated information

Endeavour Energy has not used Estimated Information, as defined in the RIN Instructions & Definitions, in reporting non-network other expenditure in table 2.6.1.

Reliability of information

All information provided represents Actual Information extracted from Endeavour Energy's reporting systems and reconciles to total non-network expenditure reported in the Annual RIN. As a result, the non-network other expenditure reported in table 2.6.1 is considered to be reliable.

2.6 Non-Network Expenditure

2.6.2: Non-Network Expenditure

Service Subcategory
IT and communications expenditure

Compliance with requirements of the notice

The data presented in the tables contained in table 2.6.2 is consistent with the definition of Non-network IT and communications expenditure per the RIN definitions contained in Appendix F. In particular:

- The Non-network IT & Communication - user numbers are the active IT system log in accounts used for regulated purposes and the Non-network IT & Communications – device numbers are the number of client devices used to provide regulated services. Client Devices are hardware devices that accesses services made available by a server and may include desktop computers, laptops, tablets and thin client interfaces and handheld end user computing devices including smart phones, tablets and laptops.

Source of information

The information used to populate the tables contained in section 2.6.2 financials 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.

Table	TM1 Cube	Description
2.6.2	Labour Info cube	The PNL cube contains Staff Details and FTE/Headcount.
2.6.2	AER Totex by account cube	The AER Totex by account cube provides financials for forecast AER period.

Set out in the table below are the specific reports used to obtain the required information for section 2.6.2:

Table	Descriptor Metrics	Description / Source
2.6.2	Employee Numbers	Historic – monthly headcount staff listing as agreed with Human Resources on a monthly basis.
2.6.2	User Numbers	CGI Active Directory Listing. These include contractors and vendors.
2.6.2	Number of Devices	CGI Billing report Schedule U – total desktop & laptops Optus & Telstra Billing Summary report – total PDA's Capital transaction report Workorder specific – Total Tablets

.

2.6 Non-Network Expenditure

To proportion metrics to regulated services, historic Standard Control % for PC/Devices was sourced from the Annual RIN.

Methodology and assumptions

The following table sets out the methodology applied to calculate the required data for the IT sections in table 2.6.2:

Table	Methodology	Assumptions
2.6.2	1. Employee Numbers extracted from Monthly Headcount Staff Listing Report for historic data. 2. Standard Control % extracted from TM1 cube Reg Accounts 3. Apply extracted Standard Control % against Employee Numbers for regulated data.	Employee Numbers are headcount numbers at June for each year. Headcount numbers provide a better comparison for user and device numbers. Standard Control % allocation sourced from Reg Accounts and AER cubes for Endeavour Energy, Labour category for each year.
2.6.2	1. User Numbers for 2019/20 actuals extracted from CGI Active Directory Listing (@ July 2020). 2. Apply extracted Standard Control % allocation against User Numbers for regulated data.	CGI Active Directory Listing lists every active account at the present time, Endeavour, CGI, Optus and any other third party who needs to have access to our systems. Periodically this list is reviewed, and updated access is removed for employees who have left the organisation, contractors who no longer need to have access etc. Standard Control % allocation sourced from Annual RIN
2.6.2	1. Device Numbers (excluding PDA's) extracted from CGI Billing report Schedule U – total desktop & laptops for historic data. 2. Device Numbers (PDA only) extracted from Optus and Telstra Billing reports for historic data.	CGI Billing Report, Schedule U provides number of desktops and laptops. Utilised CSI Billing Report for June. Optus and Telstra billing report for June provides the number of PDA's.

2.6 Non-Network Expenditure

	3. Device Numbers (Tablets only) extracted from capital expenditure report for historical data. 4. Apply extracted Standard Control % against Device Numbers for regulated data.	Capital expenditure report for 2019/20, extracted from access database (Ellipse connector script) for 2019/20 Actuals. Standard Control % allocation sourced from the Annual RIN

Use of estimated information

Endeavour Energy has not used Estimated information, as defined in the RIN Instructions & Definitions in reporting expenditure in table 2.6.3.

Reliability of information

All historical information provided represents Actual Information extracted from Endeavour Energy's reporting systems. As a result, the information contained in the tables in section 2.6.1 is considered to be reliable.

2.6 Non-Network Expenditure

2.6.3: Non-Network Expenditure

Service subcategory
Motor vehicles expenditure

Compliance with requirements of the notice

The data presented in table 2.6.3 is consistent with the definitions of Motor Vehicle Descriptor Metrics per the RIN definitions contained in Appendix F.

Source of information

The information used to populate the tables contained in section 2.6.3 was extracted from internal Fleet management reports and is consistent with other benchmarking figures provided to Networks NSW. Fleet Service Provider reports were also utilised to extract average kilometres travelled.

Methodology and assumptions

The following table sets out the methodology applied to calculate the required data for the Annual Descriptor metrics for motor vehicles in table 2.6.3:

Table	Methodology	Assumptions
2.6.3	1. **Average kilometres travelled** were derived from Fuel reports provided by leasing companies (Fleet-Plus & SG Fleet) for the leased vehicles and from the Fuel companies (Shell & Caltex) for company owned vehicles. 2. **Numbers purchased** were extracted from the Equipment register in Ellipse 3. **Numbers leased** were based on reports provided by leasing companies (Fleet-Plus & SG Fleet) and is the average number during the year 4. **Number in Fleet** is the combination of leased vehicles and company owned vehicles and is the average throughout the year	None

Use of estimated information

Endeavour Energy has not used Estimated information, as defined in the RIN Instructions & Definitions in reporting expenditure in table 2.6.3.

Reliability of information

All historical information provided represents Actual Information extracted from Endeavour Energy's reporting systems. As a result, the information contained in table 2.6.3 is considered to be reliable.

2.7 Vegetation Management

2.7 Vegetation Management

2.7.1 Descriptor Metrics by Zone

Compliance with requirements of the notice

The data presented in table 2.7.1 is consistent with the requirements of the Economic Benchmarking RIN. In particular Endeavour Energy has provided data for the descriptor metrics by zone.

Source of information

Information provided in table 2.7.1 sets out the source of the data used.

Table	TM1 Cube	Description
2.7.1	Route line length within zone	Endeavour Energy's Geographical Information System (GIS)
	Number of maintenance spans	Asplundh Tree Experts (Vegetation Contractor)
	Total length of maintenance spans	Asplundh Tree Experts (Vegetation Contractor)
	Length of vegetation corridors	NA
	Average number of trees per maintenance span	Endeavour / Fugro LiDAR data, Network Mapping Group Analysis.
	Average frequency of cutting cycle	Endeavour Energy Vegetation Reporting Database

Methodology and assumptions

The assumptions made regarding the data in Table 2.7.1 are as follows:

Table	Metric	Methodology	Assumptions
2.7.1	Route line length within zone	GIS overhead lines capture is generally single line, with all voltage levels (transmission,	Streetlight only spans are excluded in line with AER definitions.

2.7 Vegetation Management

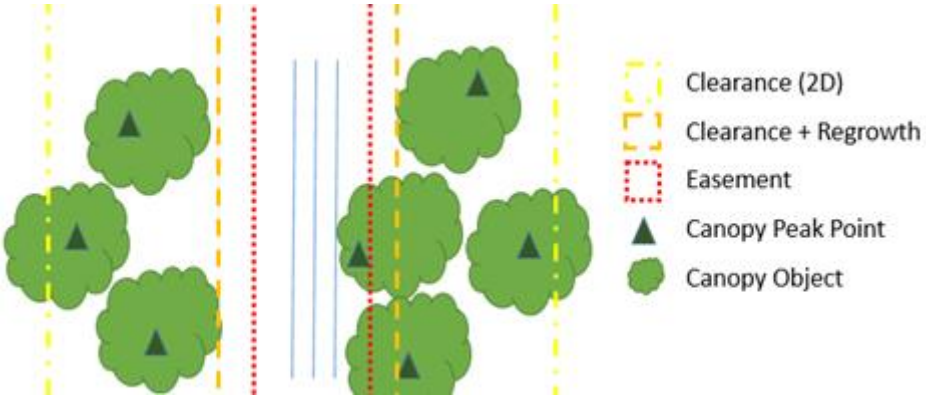
		high voltage, low voltage and streetlight conductors) recorded in GIS stacked on top of each other. The Overhead route length is conceptually the single line shadow of the network if the sun was directly overhead. Spans were determined by breaking conductors at poles and towers within 1 metre of the conductor, to form a new spatial feature or span. 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.	
	Number of maintenance spans	The count of distinct spans that underwent active vegetation management over the period.	
	Total length of maintenance spans	The sum of reported span length of spans that underwent vegetation maintenance activities.	Where the span length was not available for a given span, it was imputed using the average span length.
	Length of vegetation corridors	NA	The spatial query describes the length of vegetation corridors as zero as these are included in the route line length and is not in addition to the route line length.
	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	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.

2.7 Vegetation Management

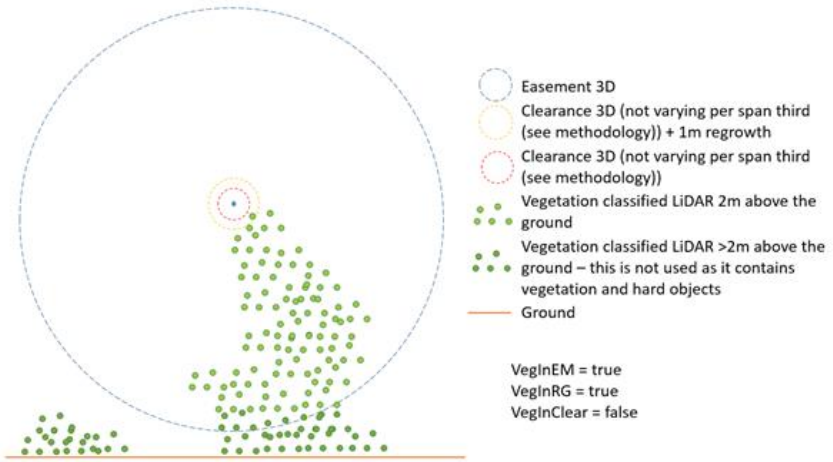
		expert consultant, NM Group. See below.	
	Average frequency of cutting cycle	Mean of recorded maintenance cycle times per vegetation zone.	

* 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:



2.7 Vegetation Management

Use of estimated information
In table 2.7.1 the average number of trees per span are estimated as outlined in the methodology above. This method is significantly enhanced on prior years due to new LiDAR coverage of the network allowing more robust estimation.

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.

2.7.2 Expenditure Metrics by Zone

Compliance with requirements of the notice
The data presented in the tables contained in section 2.7.2 is consistent with the requirements of the Economic Benchmarking RIN.

Source of information
The information used to populate the tables contained in tables 2.7.2 was extracted directly from TM1 and work order account codes in Ellipse. Endeavour Energy uses this OLAP tool for various purposes including budgeting and forecasting, monthly reporting and regulatory account allocations. It is a cube-based technology which allows rules to be created between cubes and within cubes.

Set out in the table below are the specific cubes used to obtain the required information for tables 2.7.2, along with a description in relation to the use of the cubes by Endeavour Energy.

Table	TM1 Cube	Description
2.7.2	Reg Accounts cube	The Reg Accounts cube is used by Endeavour Energy to store and report the Opex into the service categories (i.e. Standard Control, Alternate Control and Unregulated categories) at the account code level. It is the primary tool used to allocate opex in accordance with Endeavour Energy's approved Cost Allocation Method. Standard control vegetation data was extracted from the TM1 Reg Accounts cube at the account code level (N level org units) for each financial year for the category called "Regulated Network $".

Methodology and assumptions
Since Endeavour Energy completed the 2009 Distribution Determination RIN there have been a range of structural and operational changes across divisions as well as within the network functions. As a consequence, Endeavour Energy's activities and sub-activities that are used to identify actual costs by the opex categories contained in the annual RIN were reviewed and updated to ensure that the relationship between internal functions and reported costs is as robust and accurate as possible.

The cost metrics in Table 2.7.2 have been categorised and reported in a manner that is consistent with Endeavour Energy's approved Cost Allocation Method and most recent annual reporting RIN activities in the 2018-19 Regulatory Financial Statements.

2.7 Vegetation Management

The expenditure on vegetation corridor clearance and other vegetation management costs are included in the tree trimming (excluding hazard trees) expenditure line. Endeavour Energy's systems do not capture data on 'vegetation corridor clearance'. 'Other vegetation management costs' include data analytics for ongoing research and development in the vegetation management area.

An adjustment of $40,305.98 was made to reconcile costs to the AER Totex cube as instructed by finance. The information in table 2.7.2 was already prepared and reported in the Annual Financial Statements for each year of the reported periods and the information has been transposed from the final Annual Financial Statements (rather than being re-performed).

Use of estimated information

All the information provided represents actual information extracted from Endeavour Energy's reporting systems.

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.

2.7.3 Descriptor Metrics Across all Zones – Unplanned Vegetation Events

Source of information

Incidents on the network are recorded in Endeavour Energy's Outage Management System (OMS). OMS is routinely interrogated to identify any incidents where fire was involved.

A nominated representative from each of Endeavour Energy's three regions is contacted on a regular basis and requested to co-ordinate the submission of reports containing information relating to the incidents identified.

Information contained in the fire reports is entered into a MS Access database known as the Fire Reporting database.

In addition to the above process, nominated staff routinely monitor emails generated automatically from Endeavour Energy's safety incident reporting system MySafe which may also include details of fire related incidents.

The documentation relating to the above process is contained in Company Procedure (Network) GAM 0121 – Fire Incident investigation, Company Form (Network) FAM 0057 – Fire investigation report – Form A and Branch Work Place Instruction (Network Data and Performance) WPB 2008 - Management of the network fire reporting process.

Methodology

For the 2019-20 financial year records of each of the fires occurring in the year each were extracted from the Fire Reporting database and exported into a MS Excel spreadsheet. A series of calculations were embedded into the spreadsheet to identify those incidents that were vegetation related. Forty-eight incidents were identified.

2.7 Vegetation Management

Reliability of information

All the information provided represents actual information extracted from Endeavour Energy's reporting systems and reconciled to reported figures via the process detailed above. As a result, the information contained in table 2.7.3 is considered to be reliable.

2.8 Maintenance

2.8 Maintenance

2.8.1 Descriptor Metrics for Routine and Non-Routine Maintenance

Compliance with requirements of the notice

The asset quantities have been developed from Endeavour Energy's asset base and the number of assets maintained during 2019-20 have been entered and therefore comply with requirements.

Source of information

- Ellipse/Cognos;
- GIS/Network Statistics (June 2020);
- NMIP Reporting provided by Delivery Excellence Branch;
- Network Maintenance Standards;
- RIN Table 2.2; and
- RIN Table 5.2.

Methodology and assumptions

- Asset quantities have been obtained from GIS/Network Statistics (June 2020) and Ellipse data.
- Inspected/Maintained quantities have been obtained from Delivery Excellence Branch.
- The average age of the asset group was calculated from the average age of each asset category within the group weighted by the total replacement cost for each category.
- Inspection cycle data was obtained from the Network Maintenance Standards and relevant technical bulletin for each asset group.

Use of estimated information

Estimation based on the methods noted above was used to provide maintenance quantities and the average age of the asset group.

Reliability of information

The information provided has been principally based on Ellipse data and corporate finance reports available at the time of preparation.

Pole tops and overhead lines

- Asset quantities obtained from Network Statistics.
- Maintenance quantities obtained from Delivery Excellence Branch.

Service lines

- Asset quantities obtained from Network Statistics.

Overhead lines

- Asset quantities obtained from Network Statistics.
- Maintenance quantity obtained from Delivery Excellence.
- Line lengths were estimated from pole and tower volumes and typical spans for pole and tower lines.

Underground cables: by voltage

- Asset quantities obtained from Network Statistics.
- Maintenance quantities obtained from regional maintenance data.

2.8 Maintenance

Underground cables: by location
- Underground cables of all voltages obtained from Network Statistics and included in Non-CBD Asset Category.
- Maintenance quantities derived from GIS cable data under the assumption all patrols were carried out.

Distribution substation transformers
- Asset quantities obtained from Ellipse data.
- Maintenance quantity obtained from Delivery Excellence Branch.

Distribution substation switchgear
- Asset quantities obtained from Ellipse data.
- Maintenance quantity obtained from Delivery Excellence Branch.

Distribution substation – property
- Asset quantities obtained from Network Statistics.
- Maintenance quantity obtained from Delivery Excellence Branch.

Number of zone substation transformers
- Asset quantities obtained from Ellipse data.
- Maintenance quantity obtained from Delivery Excellence Branch.

Number of distribution transformers within zone substations
- Asset quantities obtained from Network Statistics and Ellipse data.
- Maintenance quantity obtained from Delivery Excellence Branch.

Zone substation properties
- Asset quantities obtained from Network Statistics.
- Maintenance quantity obtained from Delivery Excellence Branch.

Public lighting
- Asset quantities obtained from Network Statistics.
- All public lighting assets were included in the Minor Roads Asset Category.
- Maintenance quantity obtained from Delivery Excellence Branch.

SCADA & network control maintenance
- Asset quantities obtained from the SCADA group.
- Maintenance quantity obtained from Delivery Excellence Branch.

Protection systems maintenance
- Asset quantities obtained from Ellipse.
- Maintenance quantity obtained from Delivery Excellence Branch.

2.8 Maintenance

2.8.2 Cost Metrics for Routine and Non-Routine Maintenance

Compliance with requirements of the notice

The financial costs of asset maintenance for the 2019-20 year have been entered and therefore comply with the requirements.

Source of information

- Financial standard control opex records.
- Ellipse/Cognos.

Methodology and assumptions

- Financial Sub Activity types RI – Inspection and Investigation" and "RP – Preventative Based Maintenance" have been categorised as Routine Maintenance expenditure.
- All the other Financial Sub Activity types have been categorised as Non-Routine Maintenance expenditure.
- Financial Activity Types have been grouped into Maintenance Activities and Maintenance Asset Categories as shown in the Table below.

Financial Activity Type	RIN Maintenance Activity	RIN Maintenance Asset Category
OLI /GLI	Pole inspection and treatment	All poles
Transmission Mains Maintenance (OH Mains and Vegetation Control) Distribution Mains Maintenance	Overhead asset inspection	All overhead assets
Distribution UG Mains Maintenance	Network underground cable maintenance: by voltage	LV - 11 to 22 kV
Transmission Mains Maintenance (excluding OH Mains and Vegetation Control)	Network underground cable maintenance: by voltage	33 kV and above
Distribution UG Mains Maintenance Transmission Mains Maintenance (excluding OH Mains and Vegetation Control)	Network underground cable maintenance: by location	Non-CBD

2.8 Maintenance

Distribution Substation Maintenance	Distribution substation equipment & property maintenance	Distribution substation transformers
		Distribution substation switchgear (within-substations and stand-alone switchgear)
		Distribution substation - other equipment
		Distribution substation - property
Transmission Substation Maintenance (excluding building repairs and maintenance)	Zone substation equipment maintenance	Transformers - zone substation
		Transformers - distribution
		Transformers - HV
		Zone substation - other equipment
Transmission Substation Maintenance (Building repairs and maintenance)	Zone substation property maintenance	All zone substation properties
Protection and Control System Maintenance	Protection systems maintenance	Protection systems maintenance
All other maintenance activities	Other	DNSP to nominate

Use of estimated information

Financial reporting data for some maintenance activities do not have asset category level information required by RIN. In such cases estimates have been used as follows.

- Routine maintenance expenditure for “Distribution Substation Equipment & Property Maintenance” and “Zone Substation Equipment Maintenance” prorated to asset categories based on the ratios developed from NMIP routine maintenance targets.
- Non-routine maintenance expenditure for “Distribution Substation Equipment & Property Maintenance” and “Zone Substation Equipment Maintenance” prorated to asset categories based

2.8 Maintenance

on the ratios developed from 2018-19 work order expenditure for Fault and Emergencies and Condition Based Maintenance.

Reliability of information

Actual numbers from financial standard control opex records were used.

2.9 Emergency Response

2.9 Emergency Response

2.9 Emergency Response

Compliance with requirements of the notice

The data presented in table 2.9.1 is consistent with the requirements of the Category Analysis RIN. In particular:

- The data presented in table 2.9.1 (Emergency response expenditure) represents the opex split of emergency response expenditure into Standard Control Services with the definition of emergency response provided in Appendix F of the Regulatory Information Notice.
- Emergency response expenditure reported in table 2.9.1 only relates to direct expenditure incurred to restore a failed component to an operational state including all expenditure relating to the work incurred where supply has been interrupted or assets damaged or rendered unsafe by a breakdown, making immediate operations and/or repairs necessary.
- Emergency response expenditure is primarily required due to network failure caused by weather events, vandalism, traffic accidents or other physical interference by non-related entities.
- Total emergency response expenditure (A) reported in table 2.9.1 consists of direct expenditure only and excludes overheads (Direct “Network” overheads and Indirect “Corporate” overheads) and reconciles to the total direct emergency response opex as disclosed in the Annual RIN.
- All emergency response expenditure reported in table 2.9.1 are Direct Costs only as outlined in section 1.15 in Appendix E (Principles and Requirements) of the RIN and excludes expenditures on Overheads also as defined in Appendix E (Principles and Requirements) of the RIN.

Source of information

Total direct emergency response expenditure was extracted from the Annual RIN work papers. Emergency response expenditure is identified by analysing the activity and sub-activity attributes of operating expenditure transactions. Only those transactions with the following activity and sub activity combinations were applicable:

Activity	Sub Activity	Justification
All operating activities (excluding activity 11 – Third Party Impacts which is below)	RF - Fault and Emergency Repairs	Fault and Emergency repair costs are associated with the unscheduled maintenance or repair / replacement of major defective components associated with Endeavour Energy assets and equipment (e.g. through storm damage).
	74 - Unplanned Switching	Unplanned switching work costs are incurred and required for operational maintenance and construction work where no access permit has been obtained.

2.9 Emergency Response

11 - Third Party Impacts	75 - Emergency Switching	Emergency switching work costs relate to the provision of switching and fault location on the network under emergency conditions and includes work carried out by Emergency Response Officers.
	All sub activities	Non-recoverable costs incurred as a result of events such as motor vehicle accidents, vandalism, and impact damage to poles, mains, substations and street lighting requiring immediate rectification and/or repairs to make safe and operational.

To complete parts (B) and (C) all emergency response transactions were extracted from the General ledger (Ellipse - ERP). Endeavour uses Ellipse for various purposes including accounts payable, payroll, asset and equipment registers and financial reporting functions.

A list of Major event days was provided by the Network Performance Review Manager.

Methodology and assumptions

Table	Methodology	Assumptions
2.9.1 (A) Total Emergency Response expenditure	• Total emergency response direct expenditure was extracted from the AER Totex by Account cube in TM1.	None.
2.9.1 (B) Major Events O&M expenditure	• The major events identified in section 2.9.1(c) will also be reported in section 2.9.1(b). Extract all emergency response transactions from the ellipse transaction database. • Using the list of major event days provided by the Network Performance Review Manager, match these events with the expenditure captured by the parent work orders raised for each event. • Group the transactions under each of these parent work orders and report the totals for each major event day. • Also review all work orders not linked to a parent work order to determine if they relate to a major event day based on their description and add them to the reported totals.	

2.9 Emergency Response

2.9.1 (C) Major Event Days O&M expenditure	• The major events identified in section 2.9.1(b) will also be reported in section 2.9.1(c).	

Use of estimated information

Information reported in table 2.9.1 consists of Actual Information as defined in the RIN Instructions & Definitions.

Reliability of information

Information reported in table 2.9.1 consists of Actual Information extracted from Endeavour Energy's reporting systems and reconciles to direct emergency response opex figures calculated for the purposes of the Annual RIN. As a result, the information contained in table 2.9.1 is considered to be reliable.

2.10(a) Overheads

2..10(a) Overheads

2.10.1 Network overheads expenditure & 2.10.2 Corporate overheads expenditure

Compliance with requirements of the notice

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

- The data presented in table 2.10.1 (Network Overheads expenditure) represents the opex split of network overheads expenditure into Standard Control Services with the definition of network overheads provided in Appendix F of the RIN;
- Endeavour Energy has previously reported corporate overheads in its Regulatory Accounting Statements and are not included in any other overhead subcategory, therefore Endeavour Energy have reported this expenditure in regulatory template 2.10.2;
- The data in tables 2.10.1 and 2.10.2 are overhead costs that are reported before allocation to services or direct expenditure and before any capitalisation. The opex in tables 2.10.1 and 2.10.2 has been categorised and reported in a manner that is consistent with Endeavour Energy's approved Cost Allocation Method and the 2018-19 Annual RIN.

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

Source of information

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

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

Methodology and assumptions

Table	Methodology	Assumptions
2.10.1 and 2.10.2	1. Extract opex data from the TM1 AER Totex by Account cube at the account code and AER category level for the financial year. 2. Reconcile the total derived at the individual account code level to the total from the TM1 AER Totex by Account	

2..10(a) Overheads

	cube (N Level Org Units) to ensure no account codes have been excluded. 3. Populate tables 2.10.1 and 2.10.2 based on the outcome of steps 1 to 2 above. *Note: given TM1 AER Totex by Account cube data is available and represents previously reported figures, all information provided for this table consists of actual information (no estimated information required).*	

Use of estimated information

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

Reliability of information

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

2.11 Labour

2.11 Labour

2.11.1 Cost metrics per annum & 2.11.2 Extra descriptor metrics for current year

Compliance with requirements of the notice

The data presented in tables 2.11.1 and 2.11.2 is consistent with the requirements of the Category Analysis RIN. In particular:

- Only labour costs allocated to the provision of standard control services is reported in the labour cost tables.
- Labour used in the provision of contracts for both goods and services, other than contracts for the provision of labour (i.e. labour hire contracts), is not reported in these tables.
- All labour data has been presented according to the labour classification levels provided in the relevant table in the template. The methodology adopted to classify workers into the various classification levels is outlined below.
- The quantities of labour, expenditure and stand-down occurrences have not been reported multiple times across the tables.
- The Average Staff Level ('ASL') for each labour classification level reflects the average paid FTEs for each classification level over the course of the year. Specifically, this represents the average of the opening (30 June 2019) and closing (30 June 2020) staff levels for the year. One ASL is equal to one FTE employee undertaking standard control services work receiving salary or wages over the entire year. Therefore, one FTE that spends 50% of their time on standard control services work is reported as 0.5 ASL.
- Stand down periods are reported against the relevant classification level in the table containing the relevant labour.
- The labour costs consist of labour hire, ordinary time earnings, other earnings, on-costs and taxes and superannuation.

Source of information

- ASL numbers were sourced from 30 June 2019 and 30 June 2020 detailed FTE reports stored on Endeavour Energy's shared network directory. This detailed FTE information is used in labour reporting to executive management to monitor and manage labour expenditure.
- Labour expenditure, labour rates (normal time and overtime) and overtime hours information was extracted from various reporting cubes in TM1 (PNL cube, Labour Info cube, Labour Reporting cube and AER Totex by Account cube) and Ellipse tables (MSF820 + MSF801_C0_801 for rates and hours and MSF826 + MSF874 for oncost information). 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.
- Average productive work hours were sourced from the detailed FTE reports which provide weekly hours per FTE and is used to estimate the annual productive hours.

2.11 Labour

- Stand-down occurrences were sourced from Ellipse Tables MSF900 connected with MSF900_L filtered for Labour earn code “011”.

Methodology and assumptions

The following tables set out the methodology applied to obtain the required data for tables 2.11.1 and 2.11.2.

Table	Methodology	Assumptions
2.11.1	**Average Staff Level (ASL)** 1. Obtain detailed FTE reports as at 30 June 2019 and 30 June 2020 used in the preparation of labour reporting to executive management. 2. Map each worker to a labour classification level required by table 2.11.1 based on the workers position description. In addition, a Network / Corporate allocation is performed based on the workers home org unit. 3. Multiply each FTE by a standard control percentage in order to calculate standard control FTEs. The standard control percentage is calculated by analysing the standard control component of total labour expenditure (opex and capex) for each org unit. 4. Determine ALSs for each labour classification level by calculating the average standard control FTEs for the year using 30 June 2019 and 30 June 2020 data and populate table 2.11.1.	The standard control percentage for each org unit is assumed to apply equally to all employees within that org unit.
	Total Labour Expenditure 1. Extract capex labour expenditure from TM1 at the org unit level. Identify the SCS component. 2. Extract standard control opex labour expenditure from the AER Totex by account cube at the org unit level. 3. Calculate total labour cost for standard control services by org unit. Pro-rata the standard control labour cost at the org unit level to each labour classification level identified for each org unit from the detailed FTE report. 4. Summarise standard control labour expenditure by labour classification level and populate table 2.11.1.	The standard control percentage for each org unit is assumed to apply equally to all employees within that org unit. Standard control labour expenditure per org unit is assumed to be attributed to each labour classification level based on the ratio of FTEs.

2.11 Labour

	Average Productive Work Hours 1. Calculate the annual productive hours for each FTE in the detailed FTE report as hours per week (Ellipse table MSF801_C0_801) x 52.17 weeks x the average productive rate per FTE (84%). 2. Using the labour classification level mappings completed for ASL purposes, calculate the average productive hours per labour classification level and populate table 2.11.1.	Average productive rate per FTE at Endeavour Energy is estimated to be 84%.
	Stand-down Occurrences 1. Extract all stand-down transactions from Ellipse tables MSF900 connected with MSF801_C0_801 filtered transactions to labour earning code 011 (stand-down). 2. Using the employee's service number, map each employee to the relevant labour classification level (from ASL workings). 3. Divide the total number of stand-down occurrences by the ASL for each labour classification level to calculate average stand-down occurrences per ASL and populate table 2.11.1.	None.
2.11.2	**Average productive work hours (ordinary time) per ASL** is equal to the figures reported in table 2.11.1.	None.
	Average hourly rate (ordinary time) per ASL 1. Extract ordinary time hourly rates including oncost from Ellipse tables (MSF820 + MSF801_C0_801 for rates and MSF826 + MSF874 for oncost information) for each FTE listed in the detailed FTE report. 2. Using the labour classifications determined for each employee for the purposes of completing table 2.11.1, calculate an average hourly rate for each labour classification level and populate table 2.11.2.	None.

2.11 Labour

	Average productive work hours (overtime) per ASL 1. Extract overtime hours per org unit from the Labour Hours Reporting cube in TM1. 2. Pro-rata the overtime hours for each org unit over the labour classification levels within each org unit (based on FTEs) to determine overtime hours per labour classification level. 3. Divide the overtime hours for each labour classification level by the equivalent ASL for the current year to determine the average productive work hours (overtime) per ASL.	The overtime hours worked per org unit are pro-rated against the labour classification levels for each org unit based on FTE mappings.
	Average hourly rate (overtime) per ASL 1. Extract hourly rates from Ellipse tables (MSF820 + MSF801_C0_801 for rates) for each FTE listed in the detailed FTE report and apply an overtime and on-cost factor. 2. Using the labour classifications determined for each employee for the purposes of completing table 2.11.1, calculate an average hourly rate for each labour classification level and populate table 2.11.2.	None.

Use of estimated information

Estimated information was used in the following instances:

- Labour classification levels were assigned to each FTE based on an assessment of each FTEs position description. This categorisation is not maintained by Endeavour Energy in its reporting systems.
- Productive hours for each FTE were estimated since Endeavour Energy's reporting systems do not have the capability to report productive hours per FTE for the time period requested. The estimate of productive hours is based on hours worked per week times 52.17 weeks per year multiplied by the average productive labour rate (84%).

Reliability of information

Employee data, labour expenditure and stand down occurrences represent Actual Information extracted from Endeavour Energy's reporting systems. Although assumptions were required to classify the data into the labour classification levels required by the AER and determine the average productive hours, there were no other alternatives available to present the data in the form required by the AER. Therefore, the data provided is considered to be reliable.

2.11 Labour

2.11.3 Opex and Capex

Compliance with requirements of the notice

The data presented in table 2.11.3 is consistent with the requirements of the Annual RIN. In particular:

- Only costs allocated to the provision of standard control services are reported in the labour/non-labour expenditure split tables.
- Labour costs consist of salaries and wages, overtime, allowances, recruitment costs, redundancy costs, personal protective equipment, on-costs, taxes, superannuation and labour hire costs.

Source of information

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

In addition, information from Work orders and Projects was utilised for table 2.11.3 (Capex) which is received from Commercial Finance (SAMP report).

Methodology and assumptions

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

Table	Methodology	Assumptions
2.11.3 - Opex	1. Extract standard control opex at the expense element level from the *AER totex by account* cube in TM1. 2. Classify each expense element into one of the following categories based on the AER definitions provided for each category. • In-house labour expenditure; • Labour expenditure outsourced to related parties; • Labour expenditure outsourced to unrelated parties; • non-labour expenditure 3. Summarise the category totals and populate table 2.11.3 (Opex).	None

2.11 Labour

2.11.3 - Capex	1. Extract standard control capex at the expense element level from the *PNL* cube in TM1. 2. Classify each expense element into one of the following categories based on the AER definitions provided for each category. • In-house labour expenditure; • Labour expenditure outsourced to related parties; • Labour expenditure outsourced to unrelated parties; • non-labour expenditure 3. Extract alternate control services and unregulated services capex transactions from ellipse. Summarise by expense element and subtract from the totals extracted from the TM1 *PNL* cube. 4. Summarise the category totals and populate table 2.11.3 (Capex)	None

Use of estimated information
None

Reliability of information
Expense element data represents actual Information extracted from Endeavour Energy's reporting systems.

2.12 Input Tables

2.12 Input Tables

2.12 Input Tables

Compliance with requirements of the notice

The data presented in table 2.12 is consistent with the requirements of the Category Analysis RIN. In particular:

- The total amounts reported in table 2.12 reconciles to the amounts reported in tables 2.7, 2.8, 2.10A, 2.3, 2.5, 2.9, 4.1, 4.2, 4.3, 4.4, 2.2 and 2.6.
- The opex and capex data reported in table 2.12 is reported on an as-incurred basis.

Source of information

Several sources of information were used in the completion of table 2.12:

- System capex data by project and expense type was extracted from the annual system capex report.
- Non-network expenditure (capex and opex) by expense type was extracted from the general ledger (TM1 PNL cube).
- Standard control services and alternative control services opex by expense type was extracted from the AER Totex by Account cube in TM1. This cube is used by Endeavour Energy to store and report opex into service categories (i.e. Standard Control, Alternative Control and Unregulated) at the account code level. It is the primary tool used to allocate opex in accordance with Endeavour Energy's approved Cost Allocation Method. Standard and alternative control opex data was extracted from the TM1 AER Totex by Account cube at the account code level (N level org units) for the categories called "Regulated Network $" (i.e. standard control services) and "Street Lighting $" (i.e. alternative control services).
- Category Analysis RIN tables 2.7, 2.8, 2.10A, 2.3, 2.5, 2.9, 4.1, 4.2, 4.3, 4.4, 2.2 and 2.6 were also used complete table 2.12.

Methodology and assumptions

Table	Methodology	Assumptions
2.12 Input Tables **- Vegetation Management** **- Routine Maintenance**	1. Extract standard control services opex at the account code / expense element level from the AER Totex by Account cube in TM1.Using the allocations performed for the purposes of the Annual RIN, map each account code to one of the following categories: • 2.7 Vegetation Management	• The following Annual RIN category mappings were adopted in step 1: • 'Vegetation Management - Direct' mapped to '2.7 Vegetation Management' • 'Inspection – Direct & Specific', 'Maintenance & Repair – Direct &

2.12 Input Tables

- Non-routine Maintenance **- Overheads** **- Emergency Response** **- Metering (opex)** **- Fee & Quote Based Services**	• 2.8 Maintenance • 2.9 Emergency Response • 2.10A Overheads • 4.2 Metering • 4.3 & 4.4 Fee & Quote Based Services 2. Determine the proportional split by expense category (labour, materials, contractors and other) for each of the above allocations for standard control services. 3. Multiply the relevant total expenditure amount from tables 2.7, 2.8, 2.9, 2.10A, 4.2, 4.3 and 4.4 by the proportion for each expense category calculated in step 2 above and populate table 2.12.	Specific' and 'Other NM Operating Costs Direct & Specific' mapped to '2.8 Maintenance' • 'Emergency Response – Direct & Specific' mapped to '2.9 Emergency Response' • Contestable Metering - Corporate OH, Customer Funded - Corporate OH, Customer Funded - Network OH, Customer Service - Corporate OH, Customer Service - Direct, Customer Service - Network OH, Customer Specific - Corporate OH, Customer Specific - Network OH, Emergency & Recoverable Works - Corporate OH, Emergency & Recoverable Works - Network OH, Emergency Response - Corporate OH, Emergency Response - Network OH, Inspection - Corporate OH, Inspection - Network OH, Maintenance & Repair - Corporate OH, Maintenance & Repair - Network OH, Night watch - Corporate OH, Night watch - Network OH, Other Network Operating Costs - Corporate OH, Other Network Operating Costs - Direct, Other Network Operating Costs - Network OH, Other Network Operating Costs - Specific, Other NM operating costs - Corporate OH, Other NM operating costs - Network OH, Other operating costs - Corporate OH, Other operating costs - Direct, Other operating costs - Network OH, Other operating costs - Specific, Vegetation Management - Corporate OH, Vegetation Management - Network OH mapped to '2.10A Overheads' • ''Metering 5-6 – Specific, Network OH & Corporate OH' mapped to '4.2 Metering'

2.12 Input Tables

		• 'Ancillary Network Services – Direct, Specific, Network OH & Corporate OH' mapped to '4.3 & 4.4 Fee & Quote Based Services' • This methodology assumes that the proportional split by expense element obtained from the mappings outlined above represents the split of total expenditure disclosed in tables 2.7, 2.8, 2.9, 2.10A, 4.2, 4.3 and 4.4.
2.12 Input Tables **- Augex** **- Connections** **- Repex** **- Metering (capex)** **- Public Lighting (capex)**	1. Extract system capex at the account code / expense element level from the annual system capex report and map each account code to one of the following categories based on parent project numbers: • 2.3 Augex – LV feeders • 2.2 Repex – Other • 2.2 Repex – Poles / Pole top structures / Overhead conductors / Underground cables / Service lines / Transformers / Switchgear • 2.3 Augex – Distribution substations • 2.3 Augex – HV feeders • 2.3 Augex – Subtransmission substations, switching substations, zone substations and subtransmission lines • 2.5 Connections • 4.1 Public Lighting • 4.2 Metering 2. Determine the proportional split by expense category (labour, materials, contractors and other) for each of the above allocations for system capex. 3. Multiply the relevant total expenditure amount from tables 2.2, 2.3, 2.5, 4.1 and 4.2 by the proportion for each expense category calculated in step 2 above and populate table 2.12	The following capex project number mappings were adopted in step 1: • All PR*** projects excluding land purchases mapped to 2.3 Augex – Subtransmission substations, switching stations, zone substations and subtransmission lines. • All TM, TS & DS projects mapped to 2.2 Repex – Poles / Pole top structures / Overhead conductors / Underground cables / Service lines / Transformers / Switchgear • All HVW and OFP projects mapped to 2.3 Augex – HV feeders. • Project LV001 mapped to 2.3 Augex – Distribution substations. • All other LV*** projects mapped to 2.3 Augex – LV feeders. • All projects starting with IC, NU, UR and AR mapped to 2.5 Connections. • All projects starting with MC mapped to 4.2 Metering. • All projects starting with SL mapped to 4.1 Public Lighting.

2.12 Input Tables

		• All communications, automation and protection projects mapped to 2.2 Repex – Other. This methodology assumes that the proportional split by expense element obtained from the mappings outlined above represents the split of expenditure disclosed in tables 2.2, 2.3, 2.5, 4.1 and 4.2.
2.12 Input Tables **- Public Lighting (opex)**	1. Extract alternative control services opex at the account code / expense element level from the AER Totex by Account cube in TM1. 2. Determine the proportional split by expense category (labour, materials, contractors and other) for Public Lighting opex. 3. Multiply the total expenditure amount from table 4.1 by the proportion for each expense category calculated in step 2 above and populate table 2.12.	• 'Public Lighting – Direct, Specific, Network OH & Corporate OH' mapped to '4.1 Public Lighting'.
2.12 Input Tables - **Non-Network**	1. Extract non-network opex and capex at the account code / expense element level from the PNL cube in TM1.Map each sub activity for capex and branch for opex to one of the following categories: • IT • Land & Buildings • Motor Vehicles • Other 2. Determine the proportional split by expense category (labour, materials, contractors and other) for each of the above allocations.	• Activity 92 and 'Property Services', 'Fleet' & 'ICT' branches mapped to '2.6 Non-Network'

2.12 Input Tables

	3. Multiply the relevant total expenditure amount from tables 2.6 by the proportion for each expense category calculated in step 2 above and populate table 2.12.	

Use of estimated information

All information reported in table 2.12 consists of actual information (no estimated information required). However, the split of source data into the various expenditure categories required judgement to be applied as outlined above.

Reliability of information

All information used to split source data into the various expense types represents Actual Information extracted from Endeavour Energy's reporting systems and has been reconciled to reported figures in the Category Analysis and Annual RIN. While assumptions needed to be made in order to map the source data to the relevant categories and apply these percentages to expenditure totals from other Category Analysis tables, no valid alternatives exist which would result in a materially different outcome. Therefore, the data provided is considered to be reliable.

4.1 Public Lighting

4.1 Public Lighting

4.1.1 Descriptor metrics over Year

Compliance with requirements of the notice

The data provided for “Current Population of Lights” (Table 4.1.1) has been reported as of 30 June 2019 to represent the current year (2019-20). The light types are broken down into individual light types by technology.

Source of information

The number of luminaires under “Current Population of Lights” is extracted from the June 2020 Street Lighting Usage of System (SLUoS) report of the financial year 2019-20.

Methodology and assumptions

SLUoS reports are prepared by Network Revenue Analyst, Commercial Finance, Endeavour Energy, every month. The report for the month ending June 2020 was used to extract the data for 30th June 2020. The data for the assets installed and energised during the month of June 2020 are appropriated as the number of days in service in June 2020 times the asset/s installed in June 2020 divided by 30 (the total number of days in June 2020). Example: If 10 luminaires are installed in June 2020 for 27 days then the luminaire count for June 2020 will be 10X27/30=9. This methodology applies only for June 2020 as all other months have 100% active days.

Use of estimated information

Data from the SLUoS report is applied. All data on public lighting assets is held in the street lighting equipment register in the company’s Ellipse database. This includes all constructed, energised and proposed new assets. This data is the basis for generating Street Lighting Use of System (SLUoS) customer bills.

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.

4.1.2 Descriptor Metrics Annually

Compliance with requirements of the notice

The data provided under “Descriptor Metrics Annually” is in line with the data format provided. Where data is not available in the reporting format requested this is clearly documented in the Basis of Preparation.

Source of information

The information with “Descriptor Metrics Annually” is based upon Endeavour Energy projects / costs only and does not include any projects associated with Accredited Service Providers. The data was obtained from the following sources for the year 1 July 2019 to 30 June 2020.

Light Installation volume data

The data is arrived at by considering the exact increase in the luminaires in June 2019 over June 2020 from the Street Lighting Usage of System (SLUoS) report. This increase is split between Major and Minor in the ratio arrived from the population of lights. Minor is considered as luminaires below 150W and Major

4.1 Public Lighting

as 150W or higher (exception 100W LED which is Major). The current assumed split is 28% Major, 72% Minor.

Value for “Number of Poles Installed” is based on the average monthly increase from July 2019 to June 2020. This is extracted from SLUoS reports June 2020.

Light Installation Total Cost
“Total Cost” associated with Light Installation have been sourced from Endeavour Energy’s Business Analyst, Commercial Finance department for the year 2018/2019. These financial values include both street lighting costs associated with “Light Installation” as well as costs associated with “Light Replacement” for columns that have been replaced. It should be noted that ‘external works’ has been removed from this ‘total cost’ in order to apportion remaining overheads across replacement and maintenance activities.

Light Replacement Total Cost comprises of Condition based maintenance (RC) and Inspection & Investigation (RI: Patrol / Routine column inspection). The Light Maintenance Total Cost comprises of Fault and Emergency (RF) and Preventive maintenance comprising of Bulk Lamp Replacement (RP). This data is also sourced from Endeavour Energy’s Business Analyst, Commercial Finance department for the year 2019/2020.

Pole numbers: The number of poles installed includes steel columns and dedicated wood poles for street light.

Light Replacement volume data
Volume data for light replacements have been divided into four categories:
COL – Column Replacement (indicates complete new column replaced)
OMS – Outage Management System (excl luminaire change during F&E activities)
BC – Bulk Change (excl luminaire changes during bulk change activities)
LC – Luminaire Replacement = Luminaire replaced during OMS + Luminaires replaced during BC

For the purpose of compliance, the data under Light Replacement Volume and Light Maintenance Volume have been added as follows:

Light Replacement Volume = COL + LC
Light Maintenance Volume= OMS + BC

COL data was obtained from Ellipse (the organisations asset management database).

The OMS data was obtained from the organisations Outage Management System to identify the number of fault and emergency projects associated with streetlights.

The LC comprises of Luminaire replaced during Bulk Lamp Change plus Luminaire replaced during OMS. Luminaire replaced during Bulk Change was obtained from Endeavour Energy’s Technical Support Officer Street Lights and is estimated at 5% of all bulk change activities. Luminaire replaced during OMS is assumed consistent with the 5% experienced during bulk change activities.

4.1 Public Lighting

Luminaire replacement during OMS is not available in a major / minor road format and a ratio has been applied (as per previous assumptions) to obtain a split. Source of the ratio is documented in “Methodology and assumptions”.

Light Replacement Total Cost
The source of this data is as described in “Light Installation Total Cost”.

Light Maintenance Volume
The source of this data is as described in “Light Replacement volume data”. Number of poles installed is already covered in the Installation and Replacement data above. The numbers given under Maintenance refer to the Light Columns inspected during the year.

The BC data was obtained from Endeavour Energy’s Maintenance Reporting Systems Analyst from the June 2020 report.

Light Maintenance Total Cost
The source of this data is as described in “Light Installation Total Cost”.

Quality of Supply
Quality of Supply data including “Mean days to rectify/replace public lighting assets” and “Volume of Customer Complaints” was extracted from a predefined query developed for the purpose of extracting this and similar data in a controlled and consistent manner (established by Endeavour energy’s IT department) using the organisation’s COGNOS 10 program. COGNOS 10 extracts this data from Ellipse (the organisations asset management database).

“Volume of GSL Breaches” data obtained from Endeavour Energy’s Quality Improvement section who maintains a report of each GSL Breach which is stored in the organisation’s Content Server for control and security. Total GSL breaches are based on all customer complaints. “GSL payments” data is based on “Qualified Volume of GSL Breaches” multiplied by $25.00.

Methodology and assumptions
“GSL payment” data is based on “Volume of GSL Breaches” multiplied by $25.00.

The ratio used to divide BC data during OMS into major and minor roads is based on the number of lanterns smaller than 150W (Minor) and 150W or larger (Major).

Use of estimated information
All data is based on actuals or separated into Minor and Major ratio as explained above.

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

4.1 Public Lighting

4.1.3 Cost Metrics

Compliance with requirements of the notice
The data provided under Cost Metrics is consistent with the requirements of this Notice. Assumptions, if any, are explained in detail below.

Source of information
“Average Cost” data for the Installation of Lights on major / minor roads for the 2019-20 financial year was obtained from Endeavour Energy Public Lighting pricing model used to determine tariffs for the current regulatory period.

“Average Cost” data for the Replacement/Maintenance of Lights on major / minor roads for the 2019/20 financial year have been calculated using current labour and vehicles rates including on-costs, current average completion times for light replacement or maintenance, and current prices for respective lamps and luminaires.

Methodology and assumptions
Costs are based on the number average number of labour and equipment hours / costs needed to install a light on an existing pole / column with an LV supply for a small project. The current costs for all materials lanterns and lamps are than added.

Use of estimated information
Since the light may take either a short-circuiting cap or PE Cell an assumption of $5 (mid-way between the two) has been used in the establishment of these metrics.

Reliability of information
The data within the public lighting pricing model / Ellipse is considered reliable and is Endeavour Energy’s main source of asset / financial data. Historical data is frequently applied for budgeting and forecasting. Equipment costs are updated as per current pricing at the time of developing these metrics.

4.2 Metering

4.2 Metering

4.2.1 Metering Descriptor Metric

Compliance with requirements of the notice
The data presented in table 4.2.1 is consistent with the principles and requirements set out in Appendix E of the Category Analysis RIN.

Source of information
The volume of meters including key parameters such as number of phases and connection type was obtained from Endeavour Energy's meter asset management system (Banner and MBS) for the reporting period 2019-20.

Methodology and assumptions
Meter volumes for 2019-20 are based on actual volumes as at June 2020.

Important notes in relation to the interpretation of table 4.2.1:

Type 4 meters disclosed in table 4.2.1 represent non-contestable franchise market meters with communication equipment. Endeavour Energy does not have any Type 5 manually read interval meters as all meters in the Type 5 energy volume range have had communications equipment installed (and are read remotely) and therefore defined as Type 4 meters.

Use of estimated information
Nil

Reliability of information
The information provided represents Actual Information as defined in the RIN. As a result, the information contained in table 4.2.1 is considered to be reliable.

4.2.2 Cost Metrics

Compliance with requirements of the notice
The data presented in table 4.2.2 (volumes) is consistent with the principles and requirements set out in Appendix E of the Category Analysis RIN.

Source of information
The volume of meter purchase was obtained from Endeavour Energy's meter asset management system (MBS) for the reporting period 2018-19. The volume of metering services was obtained from Endeavour Energy's metering work management system (Banner) for the reporting period 2018-19.

Methodology and assumptions
The volume for the meter purchase subcategory for the reporting period 2019-20 is based on actual meter installation volumes from MBS.

Since Power of Choice, Endeavour Energy is not purchasing or installing any new Type 4 and 6 meters so the volume for meter purchase and new installation is zero for the reporting period 2019-20.

4.2 Metering

The total volume for the meter testing, meter investigation, special meter reading, meter replacement and meter maintenance subcategories for the reporting period 2019-20 are based on actual service orders completed as of 30 June 2020 from Banner. The volume for each subcategory is then assigned to a meter type based on the meter type installed at the site.

The total volume for the scheduled meter reading subcategory for the reporting period 2019-20 is based on actual volumes from data used to validate our meter reading contractor's invoice.

The total volume for the remote meter reading subcategory for the reporting period 2019-20 is based on actual Type 4 (Manually read Type 5) meters from MBS.

Important notes in relation to the interpretation of table 4.2.2 (volumes):

Type 4 meters disclosed in table 4.2.2 represent non-contestable franchise market meters with communication equipment. Endeavour Energy does not have any Type 5 manually read interval meters as all meters in the Type 5 energy volume range have had communications equipment installed (and are read remotely) and therefore defined as Type 4 meters.

The new meter installation subcategory is nil for Type 4 meters because Type 4 meters are not installed at new metering installations, instead they are meter changes from Type 6 to Type 4 once the consumption breaches the Type 6 consumption threshold.

The Meter maintenance subcategory volume is nil because since Power of Choice Endeavour Energy is not changing Type 6 and Type 4 meters as part of the maintenance program but do perform business task to meet Meter Provider and Meter Data Provider licence requirement.

The remote meter re-configuration subcategory is nil because Endeavour Energy does not perform this task.

Use of estimated information

Nil

Reliability of information

The volume information contained in table 4.2.2 represents Actual Information as defined in the Category Analysis RIN. While a number of assumptions have been applied in order to report the figures in accordance with the requirements of the Category Analysis RIN, Endeavour Energy considers these assumptions to be reliable.

4.3 Ancillary Services – Fee-based Services

4.3 Fee-based Services

4.3.1 Cost Metrics for Fee-based Services

Compliance with requirements of the notice

The data presented in tables 4.3.1 and 4.4.1 is consistent with the principles and requirements set out in the Category Analysis RIN. In particular:

- The data presented in tables 4.3.1 and 4.4.1 reflects operating expenditure and volumes relating to Ancillary Network Services for either "fee-based services" or "quoted services" in accordance with the definitions provided in the Category Analysis RIN. Specifically, fee-based services have been identified as those where a fixed fee is charged to the customer for the provision of the service (i.e. the fee charged to the customer is either fixed per job or fixed per item/activity and not charged on a per hour basis). Quoted services have been identified as those where a quoted fee is provided based on a fixed hourly rate. Quoted services have fees which are charged on an hourly basis as the nature and scope of these services are specific to individual customers' needs and vary from customer to customer.

- The fee-based services and quoted services listed in tables 4.3.1 and 4.4.1 respectively include all the services identified as Ancillary Network Services in Appendix D of the AER's Framework and Approach Paper (March 2013). This includes all fee-based and quoted services listed in the annual tariff proposal, as well as new fees for services which Endeavour Energy have not previously charged a fee for but commenced charging a fee from 2015/16 onwards (in accordance with the AER's Framework and Approach Paper).

- Nightwatch has been included in Endeavour Energy's Ancillary Network Services starting FY2019-2020 being previously unregulated.

- A description of each Ancillary Network Service (which covers all fee-based and quoted services listed in templates 4.3 and 4.4), is included in the Service Description page of each Ancillary Network Service Fee Methodology document provided as an attachment to the Substantive Regulatory Proposal ('SRP'). The purpose of each service and the activities which comprise each service are outlined in the Service Descriptions.

- Endeavour Energy has not distinguished expenditure for fee-based and quoted services between standard or alternative control services in regulatory templates 4.3 and 4.4. It is noted that for Endeavour Energy, Ancillary Network Services (which covers all fee-based and quoted services) are classified as standard control services for the 2009-14 regulatory period and alternative control services for the 2015-19 and 2020-24 regulatory periods.

- Endeavour Energy has not distinguished expenditure for fee-based and quoted services as either capital expenditure or operating expenditure in regulatory templates 4.3 and 4.4. However, it is noted that all expenditure related to fee-based and quoted services is operating expenditure.

Source of information

Information relating to fee-based and quoted services was extracted from a variety of sources as listed below. This information was used to calculate expenditure and volumes for fee-based and quoted services presented in tables 4.3.1 and 4.4.1 respectively.

4.3 Fee-based Services

- Customer Application Management System (CAMS) – A company developed database used for the management of contestable works projects. This system was used to extract volume data (where available) for certain services and service sub-categories.

- Banner – Endeavour Energy's corporate customer information and billing system. Banner contains revenue information as well as service order**1** information which has been used to extract volume data (where available) for certain services.

- Ellipse – Endeavour Energy's primary IT management system utilised for a variety of functions throughout the company. Ellipse contains Endeavour Energy's general ledger and has been used to extract and/or calculate expenditure and volumes related to fee-based and quoted services. Ellipse contains work orders which are reporting tool used to capture costs / revenue associated with a particular task.

- MBS (Metering Business System) – IT system which supports basic meter data management and market interactions with other market participants and AEMO. MBS includes service order1 information which has been used to extract volume data (where available) for certain services.

Methodology and assumptions

The specific methodology and assumptions applied to calculate expenditure and volumes varies slightly between each Ancillary Network Service.

Presented below is a high-level summary of the methodology and assumptions applied in order to calculate expenditure and volumes for each Ancillary Network Service. The methodology applied includes five broad steps:

1. Calculate volumes for each Ancillary Network Service at the fee sub-category level;
2. Calculate direct expenditure for each Ancillary Network Service at the fee sub-category level;
3. Estimate network and corporate overheads for each Ancillary Network Service at the fee sub-category level;
4. Identify the driver for each Ancillary Network Service fee at the fee sub-category level and categorise as either a fee-based service or a quoted service; and
5. Aggregate expenditure and volume data for each Ancillary Network Service and populate tables 4.3.1 and 4.4.1 in accordance with the Category Analysis RIN.

These steps are described in further detail below.

1. Calculate volumes associated with each Ancillary Network Service at the fee sub-category level

As outlined above, the specific methodology applied to calculate volumes varies slightly between each Ancillary Network Service. Presented below is a summary which outlines how volumes have been calculated for each Ancillary Network Service.

[1] A service order is a tool used by Endeavour Energy to initiate work to be carried out for a customer.

4.3 Fee-based Services

Ancillary Network Service Fee	Volume Calculation Method
Administration Fee	Method 1
Design Information Fee	Method 1
Design Certification Fee	Method 1
Design Recertification Fee	Method 1
Notification of Arrangement	Method 1
Compliance Certificate	Method 1
Inspection of service work (Level 1 work)	Method 1
Reinspection Fee (Level 1 & 2 work)	Method 1
Inspection of service work (Level 2 work)	Method 1
Provision of Access (Standby)	Method 1
Access Permits	Method 1
Contestable Substation Commissioning	Method 1
Authorisation of ASP's	Method 1
Site Establishment Fee	Method 1
Conveyancing Information	Method 1
Planning studies relating to distribution connection applications - SIMPLE JOBS	Method 1
Planning studies relating to distribution connection applications - COMPLEX JOBS	Method 1
Connection Offer Service (Basic)	Method 1

4.3 Fee-based Services

Connection Offer Service (Standard)	Method 1
Customer Interface co-ordination for contestable works	Method 1
Inv, rev & impl of remedial actions associated with ASP's connection work	Method 1
Preliminary Enquiry Service - SIMPLE JOBS	Method 1
Preliminary Enquiry Service - COMPLEX JOBS	Method 1
Services involved in obtaining deeds of agreement	Method 1
Clearance to Work	Method 1
Rectification Works	Method 1
Disconnections / Reconnections (Pole Top / Pillar Box)	Method 1
Excluded Distribution Services	Method 1
Meter Test Fee	Method 1
Off Peak Conversions	Method 2
Disconnections / Reconnections (Meter Box)	Method 2
Disconnections / Reconnections (Meter Load Tail)	Method 2
Disconnections / Reconnections (Site Visit)	Method 2
Special Meter Reads	Method 2
Move in / Move out meter reads	Method 2
Recovery of debt collection costs	Method 1
Types 5-7 nonstandard meter data services	Method 1
Franchise CT Meter Install	Method 1

4.3 Fee-based Services

Nightwatch	Method 1

Method 1 – These services generally represent Ancillary Network Services for which Endeavour Energy is charging a fee (i.e. Miscellaneous or Monopoly Fees). As a result, volume data is available from Endeavour Energy business systems (i.e. CAMS, Banner or Ellipse), or able to be calculated based on dividing revenue by current fees. Initially, volume data was extracted from business systems, or derived based on actual revenue. These volumes have also been used to populate tables 4.3.1 and 4.4.1 for these services.

Method 2 – Each of these services are predominantly carried out by the former Market Operations branch (currently S620- Field Operations) in Endeavour Energy, with the services initiated by service orders issued by Retailers or through internal processes. Service order volumes were extracted for the financial year from MBS to allocate operating expenditure.

2. Calculate direct expenditure for each Ancillary Network Service at the fee sub-category level

As outlined above, the specific methodology applied to calculate expenditure varies slightly between each Ancillary Network Service. Presented below is a summary which outlines how direct operating expenditure has been calculated for each Ancillary Network Service.

Ancillary Network Service Fee	Opex Calculation Method
Administration Fee	Method 1
Design Information Fee	Method 1
Design Certification Fee	Method 1
Design Recertification Fee	Method 1
Notification of Arrangement	Method 1
Compliance Certificate	Method 1
Inspection of service work (Level 1 work)	Method 1
Reinspection Fee (Level 1 & 2 work)	Method 1
Inspection of service work (Level 2 work)	Method 1
Provision of Access (Standby)	Method 1

4.3 Fee-based Services

Access Permits	Method 1
Contestable Substation Commissioning	Method 1
Authorisation of ASP's	Method 1
Site Establishment Fee	Method 1
Conveyancing Information	Method 1
Planning studies relating to distribution connection applications - SIMPLE JOBS	Method 1
Planning studies relating to distribution connection applications - COMPLEX JOBS	Method 1
Connection Offer Service (Basic)	Method 1
Connection Offer Service (Standard)	Method 1
Customer Interface co-ordination for contestable works	Method 1
Inv, rev & impl of remedial actions associated with ASP's connection work	Method 1
Preliminary Enquiry Service - SIMPLE JOBS	Method 1
Preliminary Enquiry Service - COMPLEX JOBS	Method 1
Services involved in obtaining deeds of agreement	Method 1
Clearance to Work	Method 1
Rectification Works	Method 1
Disconnections / Reconnections (Pole Top / Pillar Box)	Method 1
Excluded Distribution Services	Method 1
Meter Test Fee	Method 1

4.3 Fee-based Services

Off Peak Conversions	Method 2
Disconnections / Reconnections (Meter Box)	Method 2
Disconnections / Reconnections (Meter Load Tail)	Method 2
Disconnections / Reconnections (Site Visit)	Method 2
Special Meter Reads	Method 2
Move in / Move out meter reads	Method 2
Recovery of debt collection costs	Method 1
Types 5-7 nonstandard meter data services	Method 1
Franchise CT Meter Install	Method 1
Nightwatch	Method 1

Method 1 – Some of the Ancillary Network Services processes have already been developed to capture direct operating expenditure at the work order level (costed to activity 60 in the GL). Costs are captured by either of the methods outlined below:

- Costs are booked directly to the work orders by the relevant staff involved in the service; or
- Costs are calculated based on resource requirement (labour hours) and labour rates provided by internal stakeholders and then journaled to the relevant work order.

Each individual work order is mapped directly to an Ancillary Network Service category. For those services that have various sub categories, operating expenditure was allocated based on revenue received for each sub category.

Method 2 – Each of these services are predominantly carried out by the former Market Operations branch in Endeavour Energy, with some involvement from Network Operations (for off peak conversions).

Operating expenditure for Network Operations (for off peak conversions) was extracted from the relevant work orders that were set up for this service.

3. Estimate network and corporate overheads for each Ancillary Network Service at the fee sub-category level

The expenditure calculated in step 2 above only relates to direct operating expenditure. In order to allocate a reasonable portion of network and corporate overheads to each Ancillary Network Service, the average

4.3 Fee-based Services

network and corporate overhead factor derived from the Cost Allocation Methodology (CAM) model for 2019-20 (specific to Ancillary Network Services) was applied to direct costs for 2019/20.

4. Identify the driver for each Ancillary Network Service fee at the fee sub-category level and categorise as either a fee-based service or a quoted service

The driver for each Ancillary Network Service fee was identified as either being on a per unit basis (i.e. per job, project, lot, pole etc.) or a per hour basis. Based on the identified fee driver, each fee sub-category was identified as either a fee-based service (charged on a per unit basis) or a quoted service (charged on a per hour basis).

5. Aggregate expenditure and volume data for each Ancillary Network Service and populate tables 4.3.1 and 4.4.1 in accordance with the Category Analysis RIN

Expenditure and volume data for each Ancillary Network Service was aggregated into a single worksheet and the data for each fee sub-category was populated into tables 4.3.1 and 4.4.1 based on the identification performed in step 4 above.

Use of estimated information

Endeavour Energy has not used estimated Information in completing table 4.3.1 and 4.4.

Material accounting policy changes

Endeavour Energy have not undertaken any material changes in accounting policies which would impact the data contained in tables 4.3.1 and 4.4.1.

Reliability of information

While a number of assumptions have been applied in order to derive expenditure and volume data for 2019-20, for certain Ancillary Network Fees and at the fee sub-category level required by tables 4.3.1 and 4.4.1, Endeavour Energy considers these assumptions to be reasonable and without valid alternatives and therefore the resulting information to be reliable.

4.4 Ancillary Services – Quoted Services

4.4 Quoted Services

4.4.1 Cost Metrics for Quoted Services

Compliance with requirements of the notice

The data presented in tables 4.3.1 and 4.4.1 is consistent with the principles and requirements set out in the Category Analysis RIN. In particular:

- The data presented in tables 4.3.1 and 4.4.1 reflects operating expenditure and volumes relating to Ancillary Network Services for either "fee-based services" or "quoted services" in accordance with the definitions provided in the Category Analysis RIN. Specifically, fee-based services have been identified as those where a fixed fee is charged to the customer for the provision of the service (i.e. the fee charged to the customer is either fixed per job or fixed per item/activity and not charged on a per hour basis). Quoted services have been identified as those where a quoted fee is provided based on a fixed hourly rate. Quoted services have fees which are charged on an hourly basis as the nature and scope of these services are specific to individual customers' needs and vary from customer to customer.

- The fee-based services and quoted services listed in tables 4.3.1 and 4.4.1 respectively include all the services identified as Ancillary Network Services in Appendix D of the AER's Framework and Approach Paper (March 2013). This includes all fee-based and quoted services listed in the annual tariff proposal, as well as new fees for services which Endeavour Energy have not previously charged a fee for but commenced charging a fee from 2015/16 onwards (in accordance with the AER's Framework and Approach Paper).

- Nightwatch has been included in Endeavour Energy's Ancillary Network Services starting FY2019-2020 being previously unregulated.

- A description of each Ancillary Network Service (which covers all fee-based and quoted services listed in templates 4.3 and 4.4), is included in the Service Description page of each Ancillary Network Service Fee Methodology document provided as an attachment to the Substantive Regulatory Proposal ('SRP'). The purpose of each service and the activities which comprise each service are outlined in the Service Descriptions.

- Endeavour Energy has not distinguished expenditure for fee-based and quoted services between standard or alternative control services in regulatory templates 4.3 and 4.4. It is noted that for Endeavour Energy, Ancillary Network Services (which covers all fee-based and quoted services) are classified as standard control services for the 2009-14 regulatory period and alternative control services for the 2015-19 and 2020-24 regulatory periods.

- Endeavour Energy has not distinguished expenditure for fee-based and quoted services as either capital expenditure or operating expenditure in regulatory templates 4.3 and 4.4. However, it is noted that all expenditure related to fee-based and quoted services is operating expenditure.

Source of information

Information relating to fee-based and quoted services was extracted from a variety of sources as listed below. This information was used to calculate expenditure and volumes for fee-based and quoted services presented in tables 4.3.1 and 4.4.1 respectively.

4.4 Quoted Services

- Customer Application Management System (CAMS) – A company developed database used for the management of contestable works projects. This system was used to extract volume data (where available) for certain services and service sub-categories.

- Banner – Endeavour Energy's corporate customer information and billing system. Banner contains revenue information as well as service order[2] information which has been used to extract volume data (where available) for certain services.

- Ellipse – Endeavour Energy's primary IT management system utilised for a variety of functions throughout the company. Ellipse contains Endeavour Energy's general ledger and has been used to extract and/or calculate expenditure and volumes related to fee-based and quoted services. Ellipse contains work orders which are reporting tool used to capture costs / revenue associated with a particular task.

- MBS (Metering Business System) – IT system which supports basic meter data management and market interactions with other market participants and AEMO. MBS includes service order1 information which has been used to extract volume data (where available) for certain services.

Methodology and assumptions

The specific methodology and assumptions applied to calculate expenditure and volumes varies slightly between each Ancillary Network Service.

Presented below is a high-level summary of the methodology and assumptions applied in order to calculate expenditure and volumes for each Ancillary Network Service. The methodology applied includes five broad steps:

1. Calculate volumes for each Ancillary Network Service at the fee sub-category level;
2. Calculate direct expenditure for each Ancillary Network Service at the fee sub-category level;
3. Estimate network and corporate overheads for each Ancillary Network Service at the fee sub-category level;
4. Identify the driver for each Ancillary Network Service fee at the fee sub-category level and categorise as either a fee-based service or a quoted service; and
5. Aggregate expenditure and volume data for each Ancillary Network Service and populate tables 4.3.1 and 4.4.1 in accordance with the Category Analysis RIN.

These steps are described in further detail below.

1. Calculate volumes associated with each Ancillary Network Service at the fee sub-category level

As outlined above, the specific methodology applied to calculate volumes varies slightly between each Ancillary Network Service. Presented below is a summary which outlines how volumes have been calculated for each Ancillary Network Service.

[2] A service order is a tool used by Endeavour Energy to initiate work to be carried out for a customer.

4.4 Quoted Services

Ancillary Network Service Fee	Volume Calculation Method
Administration Fee	Method 1
Design Information Fee	Method 1
Design Certification Fee	Method 1
Design Recertification Fee	Method 1
Notification of Arrangement	Method 1
Compliance Certificate	Method 1
Inspection of service work (Level 1 work)	Method 1
Reinspection Fee (Level 1 & 2 work)	Method 1
Inspection of service work (Level 2 work)	Method 1
Provision of Access (Standby)	Method 1
Access Permits	Method 1
Contestable Substation Commissioning	Method 1
Authorisation of ASP's	Method 1
Site Establishment Fee	Method 1
Conveyancing Information	Method 1
Planning studies relating to distribution connection applications - SIMPLE JOBS	Method 1
Planning studies relating to distribution connection applications - COMPLEX JOBS	Method 1
Connection Offer Service (Basic)	Method 1

4.4 Quoted Services

Connection Offer Service (Standard)	Method 1
Customer Interface co-ordination for contestable works	Method 1
Inv, rev & impl of remedial actions associated with ASP's connection work	Method 1
Preliminary Enquiry Service - SIMPLE JOBS	Method 1
Preliminary Enquiry Service - COMPLEX JOBS	Method 1
Services involved in obtaining deeds of agreement	Method 1
Clearance to Work	Method 1
Rectification Works	Method 1
Disconnections / Reconnections (Pole Top / Pillar Box)	Method 1
Excluded Distribution Services	Method 1
Meter Test Fee	Method 1
Off Peak Conversions	Method 2
Disconnections / Reconnections (Meter Box)	Method 2
Disconnections / Reconnections (Meter Load Tail)	Method 2
Disconnections / Reconnections (Site Visit)	Method 2
Special Meter Reads	Method 2
Move in / Move out meter reads	Method 2
Recovery of debt collection costs	Method 1
Types 5-7 nonstandard meter data services	Method 1
Franchise CT Meter Install	Method 1

4.4 Quoted Services

Nightwatch	Method 1

Method 1 – These services generally represent Ancillary Network Services for which Endeavour Energy is charging a fee (i.e. Miscellaneous or Monopoly Fees). As a result, volume data is available from Endeavour Energy business systems (i.e. CAMS, Banner or Ellipse), or able to be calculated based on dividing revenue by current fees. Initially, volume data was extracted from business systems, or derived based on actual revenue. These volumes have also been used to populate tables 4.3.1 and 4.4.1 for these services.

Method 2 – Each of these services are predominantly carried out by the former Market Operations branch (currently S620- Field Operations) in Endeavour Energy, with the services initiated by service orders issued by Retailers or through internal processes. Service order volumes were extracted for the financial year from MBS to allocate operating expenditure.

2. Calculate direct expenditure for each Ancillary Network Service at the fee sub-category level

As outlined above, the specific methodology applied to calculate expenditure varies slightly between each Ancillary Network Service. Presented below is a summary which outlines how direct operating expenditure has been calculated for each Ancillary Network Service.

Ancillary Network Service Fee	Opex Calculation Method
Administration Fee	Method 1
Design Information Fee	Method 1
Design Certification Fee	Method 1
Design Recertification Fee	Method 1
Notification of Arrangement	Method 1
Compliance Certificate	Method 1
Inspection of service work (Level 1 work)	Method 1
Reinspection Fee (Level 1 & 2 work)	Method 1
Inspection of service work (Level 2 work)	Method 1
Provision of Access (Standby)	Method 1

4.4 Quoted Services

Access Permits	Method 1
Contestable Substation Commissioning	Method 1
Authorisation of ASP's	Method 1
Site Establishment Fee	Method 1
Conveyancing Information	Method 1
Planning studies relating to distribution connection applications - SIMPLE JOBS	Method 1
Planning studies relating to distribution connection applications - COMPLEX JOBS	Method 1
Connection Offer Service (Basic)	Method 1
Connection Offer Service (Standard)	Method 1
Customer Interface co-ordination for contestable works	Method 1
Inv, rev & impl of remedial actions associated with ASP's connection work	Method 1
Preliminary Enquiry Service - SIMPLE JOBS	Method 1
Preliminary Enquiry Service - COMPLEX JOBS	Method 1
Services involved in obtaining deeds of agreement	Method 1
Clearance to Work	Method 1
Rectification Works	Method 1
Disconnections / Reconnections (Pole Top / Pillar Box)	Method 1
Excluded Distribution Services	Method 1
Meter Test Fee	Method 1

4.4 Quoted Services

Off Peak Conversions	Method 2
Disconnections / Reconnections (Meter Box)	Method 2
Disconnections / Reconnections (Meter Load Tail)	Method 2
Disconnections / Reconnections (Site Visit)	Method 2
Special Meter Reads	Method 2
Move in / Move out meter reads	Method 2
Recovery of debt collection costs	Method 1
Types 5-7 nonstandard meter data services	Method 1
Franchise CT Meter Install	Method 1
Nightwatch	Method 1

Method 1 – Some of the Ancillary Network Services processes have already been developed to capture direct operating expenditure at the work order level (costed to activity 60 in the GL). Costs are captured by either of the methods outlined below:

- Costs are booked directly to the work orders by the relevant staff involved in the service; or
- Costs are calculated based on resource requirement (labour hours) and labour rates provided by internal stakeholders and then journaled to the relevant work order.

Each individual work order is mapped directly to an Ancillary Network Service category. For those services that have various sub categories, operating expenditure was allocated based on revenue received for each sub category.

Method 2 – Each of these services are predominantly carried out by the former Market Operations branch in Endeavour Energy, with some involvement from Network Operations (for off peak conversions).

Operating expenditure for Network Operations (for off peak conversions) was extracted from the relevant work orders that were set up for this service.

3. Estimate network and corporate overheads for each Ancillary Network Service at the fee sub-category level

The expenditure calculated in step 2 above only relates to direct operating expenditure. In order to allocate a reasonable portion of network and corporate overheads to each Ancillary Network Service, the average

4.4 Quoted Services

network and corporate overhead factor derived from the Cost Allocation Methodology (CAM) model for 2019-20 (specific to Ancillary Network Services) was applied to direct costs for 2019-20.

4. Identify the driver for each Ancillary Network Service fee at the fee sub-category level and categorise as either a fee-based service or a quoted service

The driver for each Ancillary Network Service fee was identified as either being on a per unit basis (i.e. per job, project, lot, pole etc.) or a per hour basis. Based on the identified fee driver, each fee sub-category was identified as either a fee-based service (charged on a per unit basis) or a quoted service (charged on a per hour basis).

5. Aggregate expenditure and volume data for each Ancillary Network Service and populate tables 4.3.1 and 4.4.1 in accordance with the Category Analysis RIN

Expenditure and volume data for each Ancillary Network Service was aggregated into a single worksheet and the data for each fee sub-category was populated into tables 4.3.1 and 4.4.1 based on the identification performed in step 4 above.

Use of estimated information

Endeavour Energy has not used estimated Information in completing table 4.3.1 and 4.4.

Material accounting policy changes

Endeavour Energy have not undertaken any material changes in accounting policies which would impact the data contained in tables 4.3.1 and 4.4.1.

Reliability of information

While a number of assumptions have been applied in order to derive expenditure and volume data for 2019-20, for certain Ancillary Network Fees and at the fee sub-category level required by tables 4.3.1 and 4.4.1, Endeavour Energy considers these assumptions to be reasonable and without valid alternatives and therefore the resulting information to be reliable.

5.2 Asset Age Profile

5.2 Asset Age Profile

5.2.1 Asset Age Profile

Compliance with requirements of the notice
Age profiles were developed from Endeavour Energy's asset base and therefore comply with the requirements of the Notice.

Source of information
- Ellipse – Primary asset information system;
- SAP business validated pole ages; and
- GIS - geographic information system
- GIS/Network Statistics annual report (June 2019 and June 2020)

Methodology and assumptions
- Mean life was left unchanged from the 2018-19 Category Analysis RIN.
- All age profiles are recreated from bottom up data.
- Where date fields are absent for assets, a spatial analysis approach was used to determine an estimated commissioning date.
- Only Endeavour Energy owned in-service assets are reported.

Use of estimated asset age information
For some asset categories, commissioning dates were not available for individual assets. In these cases, one of two approaches are used to determine an estimated commissioning date:

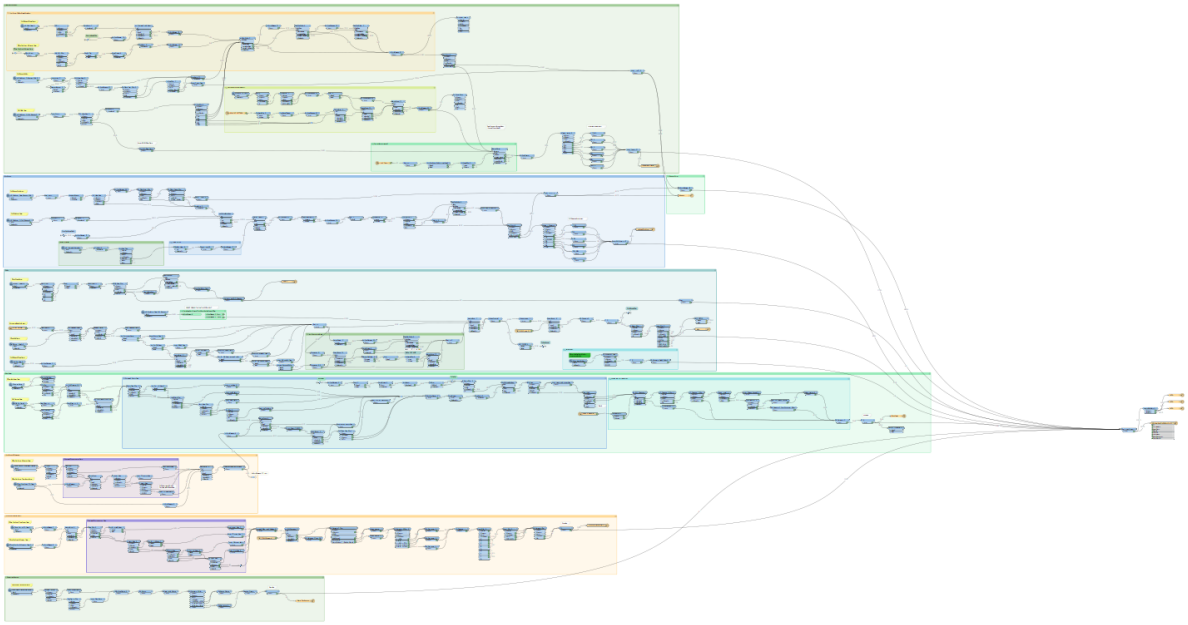
1. Spatial analysis – using the dates of adjoined or nearby equipment likely installed at the same time as the asset; or

2. Ellipse profile dates – estimated commissioning dates determined through a desktop review of available information such as drawings, serial numbers, technology type and history of network development.

Reliability of the asset age information
The asset age information is based on corporate data available at the time of preparation. A model estimates asset commissioning dates where asset data is absent using the methods described within this report.

Age profile modelling software
The data integration platform FME was used to extract the data for this report. The workflow used within this software is shown in the image below.

5.2 Asset Age Profile



Asset categorisation

The categorisation of assets for table 5.2 is determined using the following Ellipse asset attributes:

- Equipment Group ID;
- Nominal Voltage;
- Rated Voltage;
- Equipment Function;
- Equipment Rating; and
- Phases.

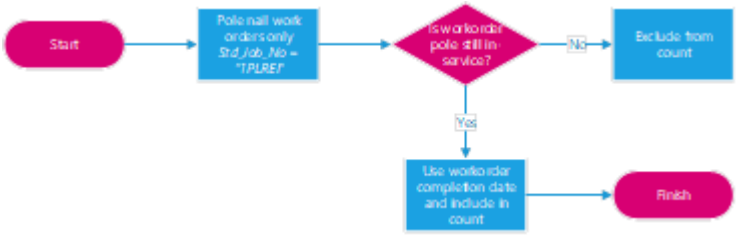
For linear assets, categorisation for table 5.2 is determined using the following GIS asset attribute:

- Operating Voltage.

Age profile methods by asset type

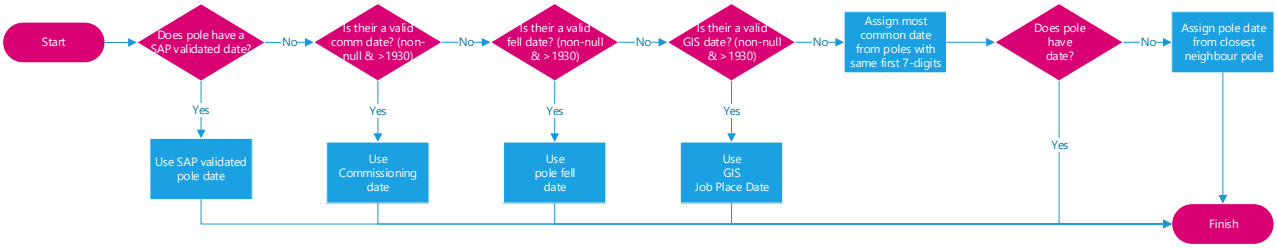
Poles

- Reinstatement (staking) of wooden poles are developed from completed Ellipse work orders that are linked to in-service pole assets.



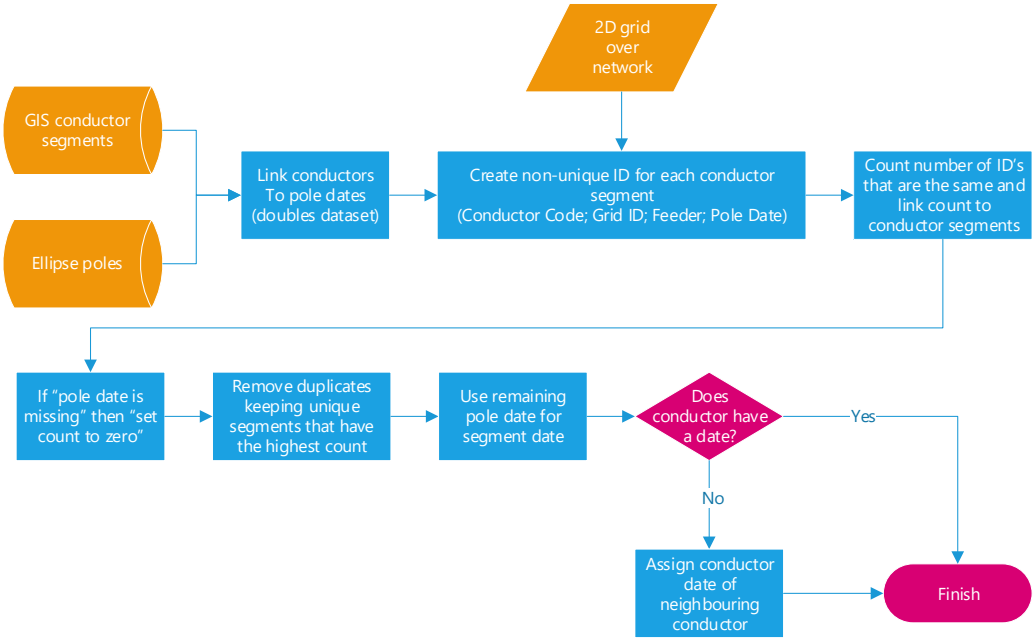
5.2 Asset Age Profile

- Wood, Concrete and Steel Poles use the SAP validated pole dates followed by date data from Ellipse, GIS and then spatial analysis.



Overhead conductors

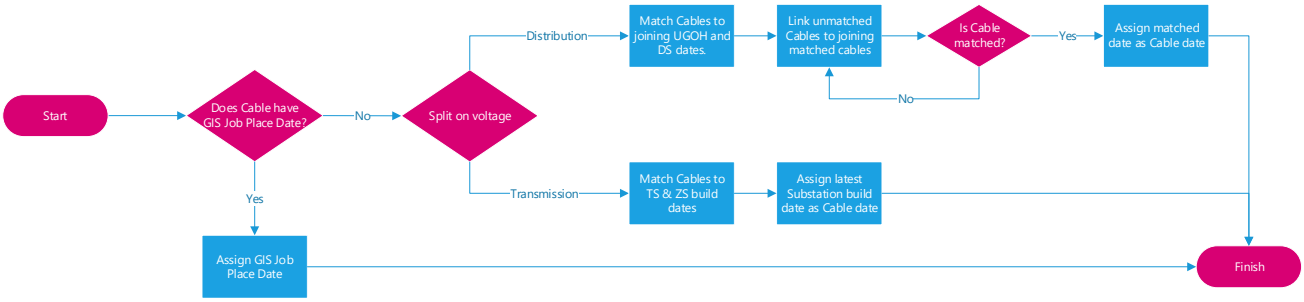
The following flow chart outlines the process used for determining overhead conductor ages using spatial analysis to estimate span ages from known pole dates.



Underground cables

The following flow chart outlines the process used for determining underground cable ages using spatial analysis to estimate cable ages from known UGOH pole dates, distribution substation dates, transmission substation dates and zone substation dates.

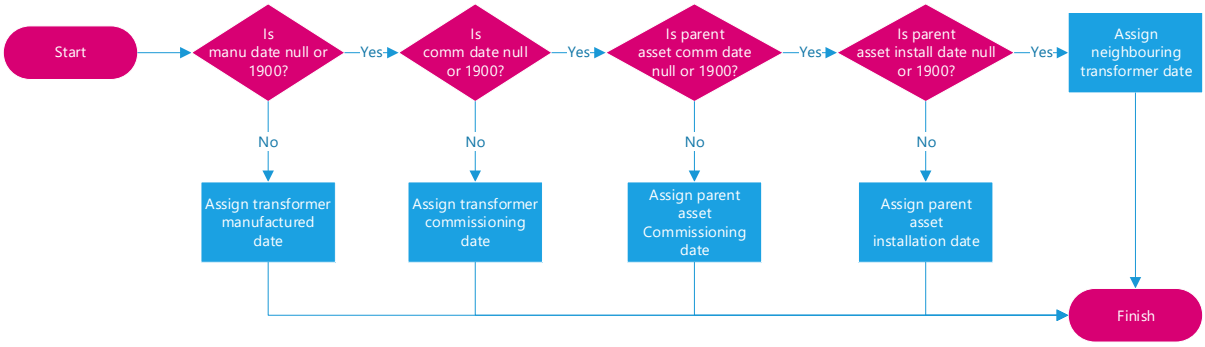
5.2 Asset Age Profile



Transformers

- For larger power transformers categorised by Ellipse equipment class “PX”, Ellipse commissioning and manufacture date data is used to determine each asset commissioning date.

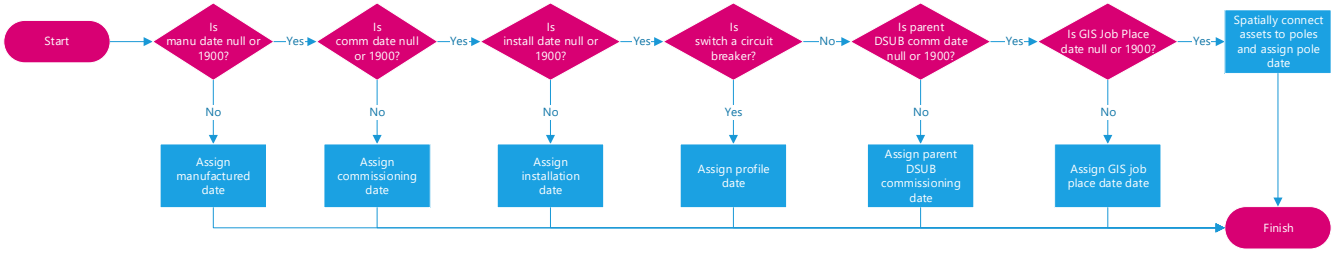
- For smaller distribution transformers categorised by Ellipse equipment class “TX”, a combination of Ellipse transformer date data and Ellipse distribution substation date data is used to determine the asset commissioning date. The flowchart below outlines the process used.



Switchgear

A combination of date data from Ellipse and GIS was used to determine switchgear ages. Where all asset and parent asset date data are absent, spatial analysis linking switchgear assets to poles is then used to estimate the commissioning date.

For ground-based distribution substation switchgear, a single high-voltage and low-voltage switchgear unit was counted in preference of multiple switchgear assets that make up a single unit.



5.2 Asset Age Profile

Streetlighting

- The age profile for the last five years was developed from Ellipse commissioning data.
- The existing age profile was scaled to match 2019-20 Network Statistics quantities.

SCADA, network control and protection systems

Asset quantities were provided by the EE Telecommunication Section from their own records and from the asset class plans.

Pilot Cables

- Latest installed quantities estimated by examining difference between 2018-19 and 2019-20 total volumes.
- The existing age profile was scaled to the 2019-20 Network Statistics quantities.

Other DNSP defined

Substation Establishments

The age profile was developed by adding new equipment records that were non-existent in the 2018-19 Category Analysis RIN to the 2019-20 profile. In addition, units were removed from the age profile which were no longer in service.

Distribution Substations

The age profile was developed by adding new equipment records that were non-existent in the 2018-19 Category Analysis RIN to the 2019-20 profile. In addition, units were removed from the age profile which were no longer in service.

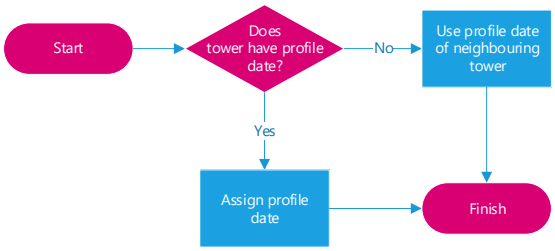
Capacitor Banks

- Capacitor Banks have been included in the DNSP DEFINED category.

- The age profile was developed by adding new equipment records that were non-existent in the 2018-19 Category Analysis RIN to the 2019-20 profile. In addition, units were removed from the age profile which were no longer in service.

Transmission Tower

Transmission tower commissioning dates use the Ellipse profile date which was estimated from a desktop review of drawings and the history of development of the network. Where the profile date is missing, a commissioning date is estimated through spatial analysis using the neighbouring tower profile date.



5.3 Maximum Demand at Network Level

5.3 Maximum Demand at Network Level

5.3.1 Raw and weather corrected coincident maximum demand at network level

Compliance with requirements of the notice

All data supplied complies with the requirements of the Regulatory Information Notice. Data has been entered into the spreadsheet by following the instructions set out in the RIN.

Source of information

All demand and temperature data were sourced from EE's Historian reports, TM1 report and PQM database. SCADA data would be used as a substitute where gaps existed in the metering data. Where neither metering nor SCADA data was available, circuit breaker data would be used, SDF2021-2030 – Weather Correction

Methodology and assumptions

Actual Data (Raw & Co-incident) requested for 2019-20 was taken from Historian.

Network total refers to the summation of all the Bulk Supply Points (BSP) and all the known embedded generation.

Embedded Generation has been included in the figures provided.

Embedded Generation data has been included in the table where generators are above 5MW and are registered with AEMO.

See Basis of Preparation (Worksheet 5.4) for short description of forecasting methodology and weather correction.

Use of estimated information

No estimations were provided in this worksheet.

Reliability of information

Network load information is sourced from measured values and is considered reliable.

5.4 Maximum Demand and Utilisation at Spatial Level

5.4 Maximum Demand and Utilisation at Spatial Level

5.4.1 Non-Coincident and Coincident Maximum Demand

Compliance with requirements of the notice

All data supplied complies with the requirements of the Regulatory Information Notice. Data has been entered into the spreadsheet by following the instructions set out in the RIN.

Source of information

- EE's Historian reports – Raw data
- Summer Demand Forecast (SDF2021-2030) – Used to obtain the substation capacity (N) to calculate the Firm Capacity Ratings (N-1). Weather Correction was also obtained from the Forecast Document.
- Endeavour Energy Transmission Network Cyclic Rating Report July 2016 - Cyclic Ratings Report.

Methodology and assumptions

For 2019-20 the network peak demand occurred in summer. All substation data within the RIN refers to Summer 2019-20.

Subtransmission substations refer to the Bulk Supply Points (BSP) owned by TransGrid.

Actual Data (Raw & Co-incident) requested for 2019-20 was taken from EE's Historian.

Coincident weather normalised values in the RIN – These are calculated from a ratio based on the Endeavour Energy weather normalised demand divided by the Endeavour Energy Actual. This ratio is subsequently multiplied by the coincident substation demand to obtain the coincident weather normalised value. i.e.:

- 10% PoE Coincident Weather Normalised = Coincident peak of Zone Substation or Transmission Substation * (ZS or TS 10% PoE weather normalised/ZS or TS actual)
- 50% PoE Coincident Weather Normalised = Coincident peak of Zone Substation or Transmission Substation * (ZS or TS 50% PoE weather normalised/ZS or TS actual)

Embedded Generation

Embedded Generation data has been included in the tables where generators are above 5MW and are registered with AEMO. Generators that have been included in the calculations for connection point are semi-scheduled and scheduled.

BSP non-coincident embedded generation is the MW at the equivalent time of BSP non-coincident peak demand date and period

BSP coincident embedded generation is the MW at the equivalent time of EE Network season peak demand date and period

Further details can be found below:

5.4 Maximum Demand and Utilisation at Spatial Level

Subtransmission Level:

- Dapto BSP – Scheduled Generation
- Holroyd BSP - Scheduled Generation
- Macarthur BSP – Non-Scheduled Generation
- Sydney West BSP - Non-Scheduled Generation

Substation Cyclic Ratings (MVA):
Substation Ratings – All substation ratings in the RIN refer to the substations firm capacity (N-1). The Summer Demand Forecast Report is used to obtain the substation capacity (N). The firm rating (N-1) is then calculated by subtracting the largest transformer from the installed substation capacity (N).

Substations which only have one transformer:

- Appin 1 x 15MVA
- Berrima Junction 1 x 20MVA
- Bolong Road 1 12.5MVA
- Glenorie 1 x 15MVA
- Ilford Hall 1 x 2.5MVA
- Jamberoo 1 x 3.75MVA
- Marsden Park 1 x 45MVA
- Meadow Flat 1 x 2.5MVA
- South Marsden Park 1 x 15MVA
- South Leppington 1 x 45MVA
- The Oaks 1 x 15MVA
- Wentworth Falls 1 x 10MVA
- Wisemans 1 x 12.5MVA
- Yatte Yattah 1 x 6.5MVA

Short Description of the Weather Correction Process and forecasting methodology:
Weather correction is applied to the peak demands at substations where there is a strong relationship between demand and temperature. Summer demands at zone substations in the Blue Mountains and demands of all high voltage customers are not subject to any weather normalisation.

A new improved weather normalisation method based on a simulation approach has been developed and adopted. This will be used to normalise peak demands for the EE network area. Two reference weather stations were employed for temperature correction of the maximum demand (TCMD) for summer. One weather station at Nowra is used for the South Coast area which covers the Dapto BSP Region and the other weather station at Richmond is used for the remaining EE areas. The temperature correction method is basically divided into the following steps:

- To develop/update a regression model for estimating the relationship of demand, weather and periodic patterns (calendar effects) of demand.
- To simulate the demand using multi-years of historical weather data to produce 10% and 50% normalised demand.

5.4 Maximum Demand and Utilisation at Spatial Level

For summer, the regression model used the most recent six years of daily maximum demand and temperature to determine the relationship between demand, weather and periodic patterns of demand. Various input parameters were employed for the model. Day of the week variables accounted for the difference between daily peak by day of the week and workday/non-workday. A set of holiday variables were included to describe the load reductions associated with holidays.

Separate variables were used for the following days: New Year's Day, Australia Day, and Christmas. In addition, a school holiday variable was introduced to capture the reduced loads (increased loads in some south coast zone substations) occurring during the school holiday period in December and January. Monthly and bimonthly variables captured some of the seasonal demand variations. Year variables described the changes in base load level for each year. Previous hot day effect variables were included to explain the impacts of the successive hot days on daily peak demand.

From the regression model, daily demands were estimated using 24 years of daily weather data available at the reference weather stations. Annual seasonal maximum demands were derived from the calculated daily demands. The 10% and 50% demand values were computed from the distribution of annual seasonal maximum demands to give the 10% and 50% PoE TCMD values. Error adjustment was applied to the 10% and 50% PoE TCMD values using the error simulation results for zone substations in western Sydney region and the South Coast. The final TCMD values for the latest year are the starting points of the peak demand forecasts.

Peak demand forecast considers the growth from the existing customers as well as the new customer connections. The forecasting process can be divided into two major steps. The first step is to estimate the organic growth at the zone substation which specifies the internal growth from its existing customers likely to be experienced over the forecast period. The organic growth for each zone substations was taken from the results of the NIEIR report3 prepared for EE on post model adjustments for peak demand forecasts. The reports estimated the demand impacts from different state and national energy policies and programs, such as Minimum Energy Performance Standards (MEPS), NSW Energy Savings Scheme (ESS), change of building codes and NSW Solar Bonus Scheme (SBS). This growth at the zone substation was used to establish the base level of the 10-year forecast.

The second part of the forecast process involves incorporating the planner's inputs to the base level forecast. The inputs include new developments planned to occur (lot releases), new load increases expected from customer applications (spot loads) and also information regarding the transfer of load from one zone or subtransmission substation to another (load transfers). The final forecast at a zone substation is derived from the base level forecast after adjustment for planned load transfers, spot loads, land releases and re-development within the zone substation load catchment area.

The final forecasts for all zone substations were presented to the Network Planners for review and confirmation of the expected demand growth. The Network Planners' local knowledge is vital in determining load transfer, embedded generation, proposed spot-loads and predicted lot release information. This feedback also provides an audit trail for quality purposes.
The forecast at transmission substations and bulk supply points is based on the rolled-up zone substation forecast and calculated using the corresponding historical diversity factors.

[3] NIEIR(2019): Post-modelling adjustments of forecasts to 2028-29 for Endeavour Energy. National Institute of Economic and Industry Research

5.4 Maximum Demand and Utilisation at Spatial Level

Use of estimated information

Estimations and assumptions

For each substation where no actual MVA information was available for the financial years required, an MVA estimate was calculated by dividing the substations historical average power factor by the actual recorded peak MW value.

If the explanation above is not valid for a particular substation it will be identified below with reasons for the estimation and the approach used to obtain the estimation.

Subtransmission:

No estimation

Zone Substation:

- Emu Plains – For FY2019-20 an assumed PF of 1.000 was used for the conversion to MVA
- Greystanes – For FY2019-20 an assumed PF of 1.000 was used for the conversion to MVA
- Homepride - For FY2019-20 an assumed PF of 0.995 was used for the conversion to MVA
- Russell Vale – For FY2019-20 an assumed PF of 0.993 was used for the conversion to MVA

Reliability of information

Network load information is sourced from measured values and is considered reliable.

6.3 Sustained Interruptions to Supply

6.3 Sustained Interruptions to Supply

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

Excluded incidents have been determined in accordance with the requirements of the STPIS (3.3a)
Major Event Days (MED's) have been determined in accordance with the requirements of the STPIS (3.3b) – and as per Endeavour Energy distribution determination 2019-20 Attachment 11 – 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.

Therefore, the 2019-20 MED SAIDI threshold is 3.764 minutes and any day in the period that exceeded this threshold was classified as a MED.

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

Base outage data (customers interrupted and CMI)
Data sourced from OMS. All records in this database were validated and checked in accordance with a Work Place Instruction WPT0001 (supersedes WPB1014).

Reporting tool – Cognos 10

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

Methodology and assumptions

MED days – MED day threshold of 3.764 minutes (2019/20 threshold) was applied, therefore any day in the period that exceeded this threshold was classified as a MED.

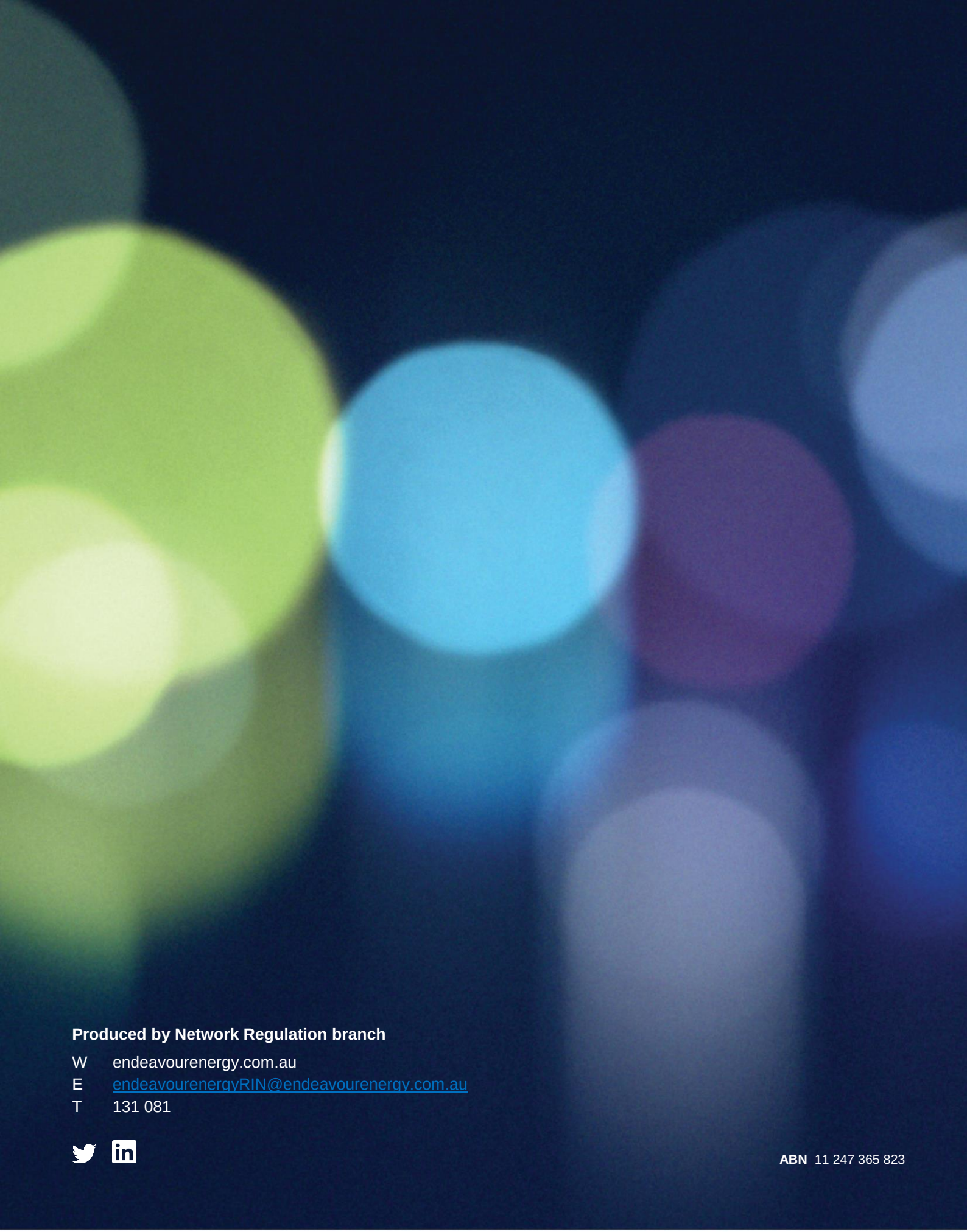
Excluded interruptions – Excluded interruptions are based on a cause or factor that is assigned to each interruption in accordance with STPIS 3.3a.

Allocation of Reason for Interruptions and detailed Reason for Interruption

Interruption cause information in the OMS does not record causes in the same way as the RIN. Therefore, causes in OMS were mapped to the RIN causes in an external mapping table.

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.



Produced by Network Regulation branch

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

ABN 11 247 365 823

Endeavour Energy