Basis of Preparation

> Response to Category Analysis RIN 2015-16

CONTENTS

1 Purpose

This document is Essential Energy's Basis of Preparation in relation to the audited Category Analysis RIN data as required by part 1.2 of Schedule 1 of the AER Regulatory Information Notice.

It explains the basis upon which information was prepared for all information in the Category Analysis RIN template. As required by the AER, this Basis of Preparation is a separate document that has been submitted with the completed regulatory templates.

1.1 AER's Instructions

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

Essential Energy must include in its Basis of Preparation, any other information prepared in accordance with the requirements of the Notice.

The AER has set out what must be in the Basis of Preparation. This is set out in Table 1 below.

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

Table 1 – Requirements of the Basis of Preparation

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

When reporting an audit opinion or making an attestation report on the regulatory templates presented by Essential Energy, an auditor or assurance practitioner shall opine or attest by reference to Essential Energy's Basis of Preparation.

1.2 Structure of this Document

This document is structured as follows:

- Firstly, Essential Energy's general approach to developing the RIN response is explained. This includes the identification of key systems used to source data, issues relating to data quality and a general comment on the reliability of the data for benchmarking purposes.
- Secondly, the response to worksheets **2.1** to **6.3**, is set out in accordance with the AER's instructions. It is noted that Worksheet **1.0** requires no input material.

2 General Approach

In this section, Essential Energy's approach to collecting and preparing information for the Category Analysis RIN is explained.

A key concern of Essential Energy is that the AER may use information which is of a poor quality to make regulatory determinations or benchmarking comparisons.

Essential Energy has identified areas where information is considered to be unreliable and once again suggests the AER use caution when applying this data for benchmarking purposes.

2.1 Systems Used to Provide Data

Where data has been sourced directly from Essential Energy's financial and other information systems, this system has been identified. Similarly where estimated data is based on data sourced from Essential Energy's systems, those systems are identified.

2.2 Data Quality Issues

In previous consultations on the RIN, Essential Energy raised significant concerns with providing some of the data in the form required by the AER. Although the RIN specifies that all data provided is to be actual (not estimated) from 2014-15 onwards, we do not have the information to be able to provide this for all tables and the cost of putting in systems to be able to provide this information is cost prohibitive and would require a long time to implement.

Essential Energy continues to stress concern in relation to the detailed templates submitted and the reliance on some of this information for benchmarking and decision making.

2.3 Approaching Essential Energy's Obligations under the NEL

Essential Energy's 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 Essential Energy's systems, there is a reasonable excuse under section **28(5)** of the NEL not to comply with that element of the notice. Essential Energy has strong doubts that a RIN can require the business to prepare information by way of estimate that cannot be reasonably derived from information currently held in its systems.

Essential Energy's 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. Essential Energy suggests that the AER should give more careful consideration to whether it has appropriately informed itself of the distinction under section **28D** of the NEL between the ability of a RIN to require existing information to be provided and the ability to require information to be prepared, maintained and kept on a going forward basis.

Despite this, Essential Energy has prepared and included the 2015-16 data to the best of its knowledge.

2.4 Recognition by AER that "Best Estimates" are Not Robust

The AER has acknowledged that if Essential Energy is compelled to provide best estimates then there is potential for the data to lack robustness. Essential Energy has addressed the implications of using best estimates which are not robust in this Basis of Preparation document.

2.5 Process used to determine if information is actual or estimated

Where actual information is not able to be derived from Essential Energy's financial and information systems, then information has been estimated using the best available estimate. In circumstances where the AER has recommended an approach for estimating, that approach has been followed as far as practicable and reasons for any variations have been identified and explained.

Essential Energy has implemented an internal colour coding system for the numbers in the Category Analysis RIN template to indicate actual from estimated information. This coding is shown in Table 2 below and indicates the level of reliance that should be placed on the data.

Colour Code	Availability of Data from NSP's Primary System	Additional Work Around / Estimation Techniques	Management's Comfort that Information is Fit for Purpose
Green	Available and verifiable	**Simple** – no additional work or minor work around e.g. source data from secondary system	Comfortable
Yellow	Available, but with some gaps	**Moderate** – estimate based on statistically significant sample size	Comfortable
Orange	Little or no data available	**Complex** – estimate based on formula, standard parameters or other source	Not comfortable
Red	Little or no data available	**Impossible** – rough estimate or not possible, e.g. rule of thumb from experience	Not comfortable

Table 2 – Colour Coding used in the Category Analysis RIN Template

2.6 Reliability of Applying Data to Benchmarking

Essential Energy considers the application of benchmarking to guide regulatory decision making would result in error, leading to outcomes that are detrimental to the long term interests of customers. This view is based on the following:

- As noted in section ***2.2** Data Quality Issues*, there is recognition by the AER that data quality from best estimates will not be of a robust quality, and may not pass audit and reviews. This document has identified where material has been developed from best estimates and the confidence Essential Energy has in that data. In this respect models, such as Total Factor Productivity (TFP), are based on the interaction of multi-variables. If a data series is inaccurate, it can significantly alter the findings of the model and lead to misleading conclusions.
- Essential Energy is not convinced that benchmarking tools such as TFP can be used to infer relative efficiency of DNSPs over time. The models cannot adequately normalise for differences between DNSPs, and do not provide meaningful assessment of the apparent differences in productivity levels. For example, TFP will show that a firm that replaces ageing assets has declining levels of capital productivity, as the model would show higher prices for capital while maintaining existing service levels. In Essential Energy's view this would be driven by the age of the asset base which is likely to vary between DNSPs.
- Essential Energy considers that benchmarking models such as TFP do not provide the AER with guidance on how to target its review of expenditure forecasts, as the information provided is at too high a level to identify potential areas of efficiency. The models and data collected will not provide any guidance on the underlying drivers of apparent productivity, and therefore does not provide useful analysis on which areas to review in a DNSP's Opex and Capex forecasts.

3 Financial Data

Essential Energy has prepared an overarching Basis of Preparation relating to financial data used in the RIN tables where "as incurred" financials are requested. The Basis of Preparation below applies to expenditure data contained in the following tables:

RIN Sheet	Table Number	Table Name
2.2 Repex	Table 2.2.1	Replacement Expenditure, Volumes and Asset Failures by Asset Category
2.3(b) Augex	Table 2.3.3	Augex Data – HV/LV Feeders and Distribution Substations
2.3(b) Augex	Table 2.3.4	Augex Data - Total Expenditure
2.5 Connections	Table 2.5.1	Descriptor Metrics
2.5 Connections	Table 2.5.2	Cost Metrics by Connection Classification
2.6 Non-network	Table 2.6.1	Non-network expenditure
2.7 Vegetation management	Table 2.7.2	Expenditure Metrics by Zone
2.8 Maintenance	Table 2.8.2	Cost Metrics for Routine and Non-Routine Maintenance
2.9 Emergency Response	Table 2.9.1	Emergency Response Expenditure (Opex)
2.10 Overheads	Table 2.10.1	Network Overheads Expenditure
2.10 Overheads	Table 2.10.2	Corporate Overheads Expenditure
2.12 Input tables	Table 2.12.1	Input tables
4.1 Public lighting	Table 4.1.2	Descriptor Metrics Annually
4.2 Metering	Table 4.2.2	Cost Metrics

3.1 High Level Approach for Financial Data

The financial information provided is in accordance with the definitions as provided by the AER.

A master file of financial data has been prepared which ensures that the Category Analysis RIN templates reconcile to the 2015-16 Regulatory Accounts as submitted to the AER.

The overarching Basis of Preparation for financial data is to use, where possible:

- The actual regulatory costs category totals that map to individual RIN sheets or tables.
- These totals are disaggregated where the RIN templates require lower levels of detail.
- The disaggregation is based on the actual statutory and management account cost category structures.
- A cost mapping matrix is constructed using statutory actual accounts cost categories that align to the costs categories in the RIN tables.
- This matrix is then used to apportion the regulated cost totals into the RIN tables.

Thus, the financial information in the RIN templates represents adjusted actual financial information, and has used in its calculation, actual statutory account cost category splits.

3.2 Source of Financial Information

A COGNOS dataset of PeopleSoft 2015-16 data has been extracted and reconciled to relevant management and Statutory Accounts to ensure its validity. The underlying cost structures in this data set have been mapped to the 2015-16 Regulatory Accounts. Cost matrices using Project Types Levels and Resource Categories have been constructed to provide the necessary breakdowns required in the RIN tables.

3.3 Methodology & Assumptions for Financial Data

Where the breakdown analysis of PeopleSoft data was not sufficient to satisfy RIN requests, additional mapping tables were requested from Subject Matter Experts (SMEs) in the appropriate operational areas.

3.4 Use of Estimated Financial Information

Some estimates have been supplied by operational Subject Matter Experts.

3.5 Reliability of financial information

The underlying 2015-16 financial information in the Category Analysis RIN is a reasonably accurate representation of the 2015-16 Regulatory Accounts based on Essential Energy's underlying cost categories and therefore considered to be reliable. Where the RIN template does not align to either the Regulatory Account cost categories and/or, Essential Energy's internal cost categories, subjective subject matter expert (SME) mapping has been used. There is a risk that the aggregated or disaggregated costs mapping may not align to the true intent of the RIN categories and as such caution should be used when using it for benchmarking or decision making purposes.

There is real risk that the financials to physical units at a line level may also not align, as unit data has not always been captured at the level of detail as required in the RIN and has been prepared using a different methodology compared to the financials. The unit to financial analysis should not be relied on.

Glossary of Terms

Term / Acronym	Explanation
CAM	Cost Allocation Methodology
CB	Circuit Breaker
CMDB	ICT's Configuration Management Database
COGNOS	Business reporting system that manages database information.
Diagnostic software	Radio asset database held in CMDB
EDDIS	Energy Data Distribution System
Energy	Energy Customer Information System. This is the system used by Essential Energy to maintain records of customers, meters, tariff information, consumption readings and sales.
ENI	Electricity Network Incident Failure Database
FTE	Full time employee
GIS	Geospatial Information System – also known as WASP
LeasePlan	Fleet Management company
NIEIR	National Institute of Economic and Industry Research
PeopleSoft	Essential Energy's Financial Management System including: accounts payable; payroll; asset and equipment registers and financial reporting functions.
Planning Database	• List of customer initiated projects. • Estimated unit costs for transformers based on OH/UG and kVA. Costing included estimated man hours.
PoF	Power On Fusion
Primavera	Essential Energy's project management system
Reporting Database	Stores information relating to embedded generation projects owned by Essential Energy
ROE device list	IP asset data held in CMDB
SCADA	Essential Energy uses this system to monitor and control the network.
Service Manager	Database of asset replacement and failures
SGFleet	Fleet Management company
Smallworld	Geospatial Information System (GIS) that topographically and/or schematically maps Essential Energy network assets and connections.
TotalSAFE	TotalSAFE Safety and Incident Management System
WASP	Works, Assets, Solutions and People Database
Yambay	Part of Power On Fusion
ZS	Zone Substation

Worksheet 2.1 - Expenditure summary

Table 2.1.1 – Standard control services capex

Compliance with Requirements of the Notice

This section summarises 2015-16 data for Standard Control Services Capex, broken up into various categories. It also contains a line for Capital Contributions.

Source of Information

This table is mainly a summary of Capex shown in subsequent tables of the Category Analysis RIN template, and as such, the subsequent tables in the Category Analysis RIN template are the main source of data for this table.

The 2015-16 Annual Reporting RIN has also been used to provide the total Capex figure which includes the Capital Contributions component.

Methodology & Assumptions

As most of the data shown in this table is a summary of data found in subsequent tables in the Category Analysis RIN template, the table cells are linked to the appropriate cells of other tables in the Category Analysis RIN template.

Capital Contributions were obtained from the 2015-16 Annual Reporting RIN.

Use of Estimated Information

Wherever linked data is considered to be estimated information, caution should be exercised when using this information for benchmarking or decision making purposes.

Reliability of Information

The data is considered to be reliable. Data sourced from other tables within the Category Analysis RIN template may be based on assumptions and estimates and should be used with caution when used for benchmarking or decision making purposes.

Table 2.1.2 – Standard control services opex

Compliance with Requirements of the Notice

This section contains summary data of the 2015-16 Opex for Standard Control Services, broken up into various categories. It also contains a Balancing Item.

Source of Information

This table is mainly a summary of Opex shown in subsequent tables of the Category Analysis RIN template, and as such, the subsequent tables in the Category Analysis RIN template are the main source of data for this table.

The 2015-16 Annual Reporting RIN has been used to provide the total Opex figure which was required for the calculation of the Balancing Item.

Methodology & Assumptions

As most of the data shown in this table is a summary of data found in subsequent tables of the Category Analysis RIN template, the table cells are linked to the appropriate cells in other tables in the Category Analysis RIN template.

The Balancing Item was calculated by obtaining the total Opex figure from the 2015-16 Annual Reporting RIN and deducting from it the Opex in the table.

Essential Energy has provided a reconciliation of the balancing items in Table 2.1.2 in the file *2.1 Expenditure Summary Tables Reconciliation_2016_09_21.xlsx* which is provided as an attachment.

Use of Estimated Information

Wherever linked data is considered to be estimated information, caution should be exercised when using this information for benchmarking or decision making purposes.

Reliability of Information

The data is considered to be reliable. Data sourced from other tables within the Category Analysis RIN template may be based on assumptions and estimates and should be used with caution for benchmarking or decision making purposes.

Table 2.1.3 – Alternative control services capex

Compliance with Requirements of the Notice

This section contains summary data of the 2015-16 Capex for Alternative Control Services, broken up into various categories.

Source of Information

This table is mainly a summary of Capex shown in subsequent tables of the Category Analysis RIN template, and as such, the subsequent tables in the Category Analysis RIN template are the main source of data for this table.

The 2015-16 Annual Reporting RIN was used to provide the total Capex figure.

Methodology & Assumptions

As most of the data shown in this table is a summary of data found in subsequent tables in the Category Analysis RIN template, the table cells are linked to the appropriate cells in other tables in the Category Analysis RIN template.

Use of Estimated Information

Wherever linked data is considered to be estimated information, caution should be exercised when using this information for benchmarking or decision making purposes.

Reliability of Information

The data is considered to be reliable. Data sourced from other tables within the Category Analysis RIN template may be based on assumptions and estimates and should be used with caution for benchmarking or decision making purposes.

Table 2.1.4 – Alternative control services opex

Compliance with Requirements of the Notice

This section contains summary data of the 2015-16 Opex for Alternative Control Services, broken up into various categories.

Source of Information

This table is mainly a summary of Opex shown in subsequent tables of the Category Analysis RIN template, and as such, the subsequent tables in the Category Analysis RIN template are the main source of data for this table.

The 2015-16 Annual Reporting RIN was used to provide the total Opex figure.

Methodology & Assumptions

As most of the data shown in this table is a summary of data found in subsequent tables in the Category Analysis RIN template, the table cells are linked to the appropriate cells in other tables in the Category Analysis RIN template.

Use of Estimated Information

Wherever linked data is considered to be estimated information, caution should be exercised when using this information for benchmarking or decision making purposes.

Reliability of Information

The data is considered to be reliable. Data sourced from other tables within the Category Analysis RIN template may be based on assumptions and estimates and should be used with caution for benchmarking or decision making purposes.

Table 2.1.5 – Dual function assets capex

Compliance with Requirements of the Notice

As Essential Energy has no dual function assets, no data has been input into this table.

Table 2.1.6 – Dual function assets opex

Compliance with Requirements of the Notice

As Essential Energy has no dual function assets, no data has been input into this table.

Worksheet 2.2 – Repex

Table 2.2.1 – Replacement Expenditure, Volumes and Asset Failures by Asset Category

Compliance with Requirements of the Notice

The information provided is based on all assets owned by Essential Energy as well as privately owned assets where they are managed and maintained by Essential Energy.

Data for all asset groups, other than Public Lighting, have been filtered to only include assets that are not a dedicated street light asset, and that are “in service”.

All information is in accordance with the definitions provided by the AER.

Source of Information

Several systems and planning documents have been queried. These systems and documents are listed below along with the asset group to which the data has been applied.

Source System	Asset Groups	Used For		
		Expenditure	Asset Replacements	Asset Failures
PeopleSoft	All	Yes	Yes	No
WASP	All	No	Yes	No
Planning Database	All	Yes	Yes	No
Pole Failure Database	Poles, Public Lighting	No	No	Yes
ENI	Pole Top Structures, OH Conductors, UG Cables, Service Lines, Transformers, Switchgear	No	No	Yes
Smallworld	OH Conductors, UG Cables	No	Yes	No
Primavera/Project Online	SCADA, Network Control & Protection Systems	No	Yes	Yes
Service Manager	SCADA, Network Control & Protection Systems	No	Yes	Yes
Diagnostic Software	SCADA, Network Control & Protection Systems	No	Yes	Yes
ROE device list	SCADA, Network Control & Protection Systems	No	Yes	Yes

Methodology & Assumptions

All Expenditure Categories

2015-16 expenditure has been sourced from the appropriate management accounts wherever relevant categories existed. Where appropriate categories did not exist, the management account amounts were apportioned using a model based on actual replacement expenditure recorded in the Planning Database. For example, where only a total figure for all distribution line replacement work existed, the figure was split into the sub-categories of poles, pole tops, conductors, services and switchgear, based on the refurbishment category recorded against the project in the database. These amounts have then been broken down to individual asset type categories through a ratio model based on approved capital unit rates.

All detailed replacement expenditure has been validated back to the 2015-16 Regulatory Accounts.

All Asset Groups

WASP work tasks completed as capital expenditure is used as the primary source of replacement units. In some cases the Planning Database and PeopleSoft stores transactions are used to estimate replacements that had no assigned tasks and/or were incorrectly charged to operational expenditure.

Failure numbers are based on ENI failure records for most assets.

Poles

Staking of a Wooden Pole

- Pole reinforcements (pole staking/reinstating) have been based on a count of all completed capitalised WASP work tasks (Pole - Reinstate).

Staking of a Wooden Pole - Failures

- Failures have been sourced from the Pole Failure Database. All pole failures (including staked poles) are investigated and reported on individually. WASP does not have a work task associated with failure of pole reinforcements due to the rare occurrence of these failures.

Pole Replacement

- Data has been sourced from WASP, the Planning Database and PeopleSoft.
- Data has been filtered to include only those poles that are NOT a dedicated street light asset. Unknown material types are assumed to be timber.
- Replacement data has been based on a count of all completed capitalised WASP work tasks (Pole - Condemned - Replace, Pole - Concrete - Replace, Pole Steel/Tower - Replace, Pole - Replace - System Augmentation). An estimate has also been included for poles that have been replaced without a work task. The above mentioned work tasks were checked against PeopleSoft and units booked against replacements but which had no work task were also added to the count.

Pole Failure

- Data has been sourced from Essential Energy's Pole Failure database. The data is populated from a number of different sources and independently reviewed. The sources include: individual Pole Failure reports, WASP, TotalSAFE, Electrical Network Incident Database (ENI) and Power On Fusion (PoF).
- Failure data has been based on individual Pole Failure reports, and has been filtered to include only those poles that are NOT a dedicated street light asset. Private spar poles have been excluded.

Pole Top Structures

Pole Top Replacement

- Replacement data has been based on a count of all completed capitalised WASP work tasks (Crossarm – Replace). An estimate has also been included for pole tops that have been replaced without a work task. The above mentioned work tasks were checked against PeopleSoft and units booked against replacements but which had no work task were also added to the count.

Pole Top Failure

- Failure data has been based on a count of all ENI records representing unassisted crossarm failure causes.

Overhead Conductors & Underground Cables

Conductor/Cable Replacement

- Replacement data has been sourced from reconductor construction plans entered into Smallworld.
- Data includes all capitalised conductor replacements triggered by condition.

Conductor/Cable Failure

- Failure data has been sourced from ENI.
- Data includes all failure records representing unassisted conductor/cable failures.

Service Lines

Service Line Replacement

- Data sourced from WASP and contractual records kept from Essential Energy's Overhead Service Replacement program.
- Replacement count is the sum of all completed capitalised WASP work tasks (Service – Replace Service and Service - Programmed Replacement) (internal works) and contractual units (external works).

Service Line Failure

- Failure data has been sourced from ENI.
- Data includes all failure records representing unassisted service line failures.

Transformers

- Replacement data for distribution transformers has been based on a count of completed capitalised WASP work tasks (Substation - Replace Tank and Regulator – Replace Tank). An estimate has also been included for transformers that have been replaced without a work task. The above mentioned work tasks were checked against PeopleSoft and units booked against replacements but which had no work task were also added to the count.
- Replacement data for zone substation transformers is based on WASP asset records for transformers with commissioning dates within the financial year, and then filtered to remove any new installations (ie. non-replacements).

Transformer Categorisation

- Unknown distribution substation types have been assumed to be pole substations. Unknown distribution transformer kVA is assumed to be ≤ 60 kVA. Unknown phasing and SWER is assumed to be single phase.
- As regulators, pole top or kiosk transformers > 22kV do not have their own category. They have been included in "Other".

Transformer Failure

- Failure data for distribution transformers has been based on a count of all completed OPEX WASP work tasks (Substation – Replace Tank and Regulator – Replace Tank) that were found and replaced on the same day.
- Failure data for zone substation transformers is based on WASP asset records for transformers with commissioning dates within the financial year, where the reason for replacement can be identified by a zone substation incident report or otherwise as the transformer being unfit for service.

Switchgear

Switchgear Replacement

- Replacement data for distribution switchgear has been based on a count of completed capitalised WASP work tasks (ABS - Replace, Fuse – Replace Fuse, Fuse – EDO Fuse Programmed Replacement, Links - Replace and Protection Site – Replace). An estimate has also been included for switchgear that has been replaced without a work task.
- Replacement data for zone substation switchgear was based on switchgear installed in the financial year, and filtered to remove new installations (ie. non-replacements).

Switchgear Failure

- Failure data for distribution switchgear has been based on a count of all ENI records representing unassisted switchgear failures.
- Failure data for zone substation switchgear was based on switchgear installed in the financial year where the reason for replacement can be identified by a zone substation incident report or otherwise as the switchgear being unfit for service.

Public Lighting

These figures represent only dedicated streetlight columns. All other numbers represent all streetlights.

Asset Replacements

Asset Type	Included in Totals
Luminaires	Sum of all replacement work task quantities including both routine and non-routine replacements identified by the method described for *Table 4.1.2 – Public Lighting - Descriptor Metrics Annually*.
Brackets	This data is not captured in any database.
Lamps	There are no volumes included in this section as lamps not considered to be Repex.
Poles	Replacement data has been based on a count of all completed capitalised WASP work tasks where the driver was refurbishment (Pole – Condemned – Replace, Pole – Concrete – Replace, Pole Steel/Tower – Replace, Pole – Replace – System Augmentation). The data has been filtered to only include those assets that are deemed dedicated.

Asset Failures

Asset Type	Included in Totals
Luminaires	Sum of all non-routine replacement work task quantities identified by the method described for *Table 4.1.2 – Public Lighting - Descriptor Metrics Annually*.
Brackets	This data is not captured in any database.
Lamps	There are no volumes included in this section as lamps not considered to be Repex.
Poles	Failure data has been based on unassisted failures only, and has been filtered to include only those assets that are deemed dedicated.

SCADA, Network Control & Protection Systems

- **Capital Expenditure** was sourced from the Regulatory Accounts and apportioned into the different categories based on actual expenditure in PeopleSoft financials. Capital project data was sourced from Primavera which

was used to apportion across the RIN subcategories. It is noted that during 2015-16, Primavera has been replaced with a new product, Project OnLine. Whilst there are currently issues with the replacement product, capital project data collected is an amalgam of the data still contained within Primavera as well as data collected via PeopleSoft. Telecommunications project expenditure was derived from the capital projects for PIP 49 and PIP 2007.

- Projects to deliver other network infrastructure (non-system) that has a communications component have not been reported in this section. These projects will be reported in other areas of the Category Analysis RIN depending on the specific driver for the project.
- **Asset Replacement** data was obtained from Service Manager and is based on capital replacement programs to replace End of Life assets or equipment deemed not fit for purpose. Telecommunications asset data was sourced from diagnostic tools and maintenance agreements. The data was subsequently checked by project and operational staff to rectify any discrepancies.
- **Asset Failure** data was obtained from Service Manager and relates to assets that have been replaced due to unplanned failure. Telecommunications asset failure data was also sourced from the contracted maintenance provider (UXC Connect). Incidents or faults that have been rectified by means other than an asset replacement have not been included in this section.

Customer Metering & Load Control

Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. The specific methodology and assumptions made for this table are outlined below.

- Data sourced from the Regulated Distribution System Capex Expenditure Report (RDSC) and excludes overheads.
- This report was used to reconcile back to the 2015-16 Regulatory Accounts.

Use of Estimated Information

All information is based on actual data. There is some estimated information in the data splits and disaggregation of totals.

Reliability of Information

Replacement expenditure, at an aggregate level, is considered to be reliable as it has been sourced from the 2015-16 Regulatory Accounts. Apportionment of expenditure into the different categories requested by the AER is based on assumptions and estimates so caution should be used when using this for benchmarking or decision making purposes.

Table 2.2.2 – Selected Asset Characteristics

Compliance with Requirements of the Notice

The information provided is based on all assets owned by Essential Energy as well as privately owned assets where they are managed and maintained by Essential Energy.

Data has then been filtered to only include those assets that are “in service”.

Source of Information

Data has been sourced from the following:

- Works, Assets, Solutions & People Database (WASP)
- Smallworld Geospatial Information System (GIS)

Methodology & Assumptions

Methodology & Assumptions are outlined for each category below.

Total Poles by Feeder Type

- Data was sourced from WASP with feeder type referenced from Smallworld.
- Data for poles in commission includes all owners (ie. all poles that Essential Energy inspects) and is limited to only those poles with a service status of "In Service". Data for replacements is as per Table 2.2.1.
- Feeder type has been determined by mapping individual assets to the geospatial information held in Smallworld, HV feeders based on reliability categorisation, LV feeders based on their parent HV feeder, and transmission and unknowns distributed by ratio across the three categories.
- The "Asset Volumes Currently in Commission" column includes the "Staking of a Wooden Pole" asset category, whilst the "Asset Replacements" column does not.

Overhead Conductors by Feeder & Material Type and Underground Cable by Feeder Type

- Data has been sourced from GIS Smallworld.
- Data for conductor/cable in commission includes only Essential Energy owned assets and is not limited by service status. Streetlight conductors/cables have been included; however LV services have been excluded. Data for replacements is as per Table 2.2.1.
- Feeder type has been determined by mapping individual assets to the geospatial information held in Smallworld, HV feeders based on reliability categorisation, LV feeders based on their parent HV feeder, and transmission and unknowns distributed by ratio across the three categories. Essential Energy has no CBD category feeders.
- Material type has been assigned from Smallworld attributes, with unknowns spread by ratio. All covered conductors besides LV ABC (HV ABC, CCT, etc.) has been included in "Other".

Transformers by Total MVA

- Data has been primarily sourced from WASP.
- Data for transformers in commission is a sum of the maximum MVA for all distribution and zone substation power transformers. It does not include regulators, zone substation auxiliary transformers, step up transformers, or SWER isolating transformers.
- Zone substation transformer MVA has been assumed to be 5MVA for assets with an unknown rating. Distribution transformer MVA for assets with an unknown rating has been derived from the Substation Site's "Total KVA". If this is not available, then kVA has been derived as follows (note this has only occurred in 2% of cases):
    - If Substation Site "Total KVA" is blank, then use sum of children Transformer "KVA".
    - If Substation Site "Total KVA" and children Transformer "KVA" fields are blank, then use Substation Site "Phases" as follows:
        - 3 phase = 63kVA
        - 1 phase = 10kVA
    - If Substation Site "Total KVA" and children Transformer "KVA" fields are blank and Substation Site "Phases" is blank, then use Substation Site "Construction Type" as follows:
        - Pad/Kiosk Substation = 500kVA
        - Chamber Substation = 1000kVA
        - Ground Substation = 1000kVA
        - All others (eg. Pole Substation) = 10kVA
- Data for transformers disposed is based on a sum of the maximum MVA for all transformers recorded in movement records as being scrapped.

- Data for transformers replaced is based on a sum of the maximum MVA for all distribution transformers with a completed, capitalised WASP work task (Substation - Replace Tank), as well as a sum of the maximum MVA from transformer movement records for zone substation transformers (filtered to include only replacements). The same inclusions/exclusions and assumptions apply as per the In Commission transformer sum.

Use of Estimated Information

All information is based on actual data. There is some estimated information in the data splits and disaggregation of totals.

Reliability of Information

While Essential Energy have provided their best estimate of the data, the information provided is based on assumptions and estimates and caution should be used when using it for benchmarking or decision making purposes.

Worksheet 2.3(a) – Augex

Table 2.3.1 – Augex Asset Data – Subtransmission Substations, Switching Stations & Zone Substations

Compliance with Requirements of the Notice

In the following subheadings Essential Energy demonstrates how the information provided is consistent with the requirements of this Notice.

Source of Information

Data has been sourced from PeopleSoft, Essential Energy's financial system, and cross-referenced against Primavera and Project Online, Essential Energy's project management systems and Cognos, Essential Energy's alternate reporting system.

Methodology & Assumptions

To extract the data, the following assumptions have been made:

- Transformer Units added. It is assumed that replacing one transformer with two transformers is the addition of one unit.
- Transformer MVA added. It is assumed that replacing a 10MVA with a 30MVA transformer is the addition of 20MVA.
- Switchgear Units added.
    - It is assumed that if you replace one circuit breaker ("CB") with another CB, there has been no addition.
    - It is assumed that replacing a CB and CT with a dead tank counts as a one for one replacement.
    - It is assumed that only ABS CT VT and CB are the primary plant.
    - Earth switches, FI gear, surge arrestors and fault throwers have not been included.
    - Analysis has been performed on single line diagrams for units but PeopleSoft dollars for total expenditure are based on manufacturer's names.
- Installation hours are inclusive of all hours on the project including design, and project management.
- Civil works is inclusive of the major contract (and other contracts). This could not be separated out.
- Total direct expenditure and major contract expenditure equates to the total direct costs of the project.

For the purposes of preparing the information, normal conditions are defined as those which allow the element to operate within manufacturer's specifications under a standard operational state and expected typical loads.

Use of Estimated Information

There is no estimated data for this table.

Reliability of Information

The data in this table is considered reliable.

Table 2.3.2 – Augex Asset Data – Subtransmission Lines

Compliance with Requirements of the Notice

In the following subheadings Essential Energy demonstrates how the information provided is consistent with the requirements of this Notice.

Source of Information

Data has been sourced from PeopleSoft, Essential Energy's financial system, and cross-referenced against Primavera and Project Online, Essential Energy's project management systems and Cognos, Essential Energy's alternate reporting system.

Methodology & Assumptions

To extract the data, the following assumptions have been made:

- Installation hours are inclusive of all hours on the project including design, and project management.
- Civil works is inclusive of the major contract (and other contracts). This could not be separated out.
- Total direct expenditure and major contract expenditure equates to the total direct costs of the project.

For the purposes of preparing the information, normal conditions are defined as those which allow the element to operate within manufacturer's specifications under a standard operational state and expected typical loads.

Augmentation works were new lines which connected a subtransmission substation to a zone substation at 66kV.

Use of Estimated Information

There is no estimated data for this table.

Reliability of Information

The data in this table is considered reliable.

Worksheet 2.3(b) – Augex

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

Descriptor Metrics

Feeder Augmentation

Compliance with Requirements of the Notice

The information provided reports a breakdown of circuit kilometres of both high voltage and low voltage feeders added and augmented in the current period.

Source of Information

The data for the current period was provided by the GIS team and sourced from Smallworld. The data is recorded in Smallworld by work pack close out officers at the completion of each work pack.

Methodology & Assumptions

Circuit kilometres added/upgraded

The yearly conductor alterations are extracted from Smallworld and rolled up for the reporting period. Conductor alterations recorded as “New” are reported for “Units Added” and “Reconductored” are reported as “Upgraded”.

The AER driver for each project is extracted from WASP and only projects with an Augex driver are included.

High voltage consists of all voltages not LV or Streetlight with LV being only LV voltages.

Use of Estimated Information

No information has been estimated.

Reliability of Information

The data in this table is reliant on close out officers recording the information at the completion of each work pack. The quality of this data is of a reasonably high standard.

Substation Augmentation

Compliance with Requirements of the Notice

The information provided reports a breakdown of substations that have been added or augmented in the current period.

The information is divided into the following classes:

- Pole Mounted Substations
- Ground Mounted Substations
- Indoor Substations

Source of Information

The data for the current period was sourced from a report that looks at the construction unit assemblies associated with projects and their work packs in WASP and identifies those that involve a transformer store item being ordered.

Methodology & Assumptions

Distribution Substations Added/Refurbished/Upgraded:

The data for the current period was sourced by categorising the transformers in the WASP report into Pole, Ground or Indoor substations based on the description of the transformer store item being ordered (description example: “Transformer 25kVA 22kV 1Ph [GWD]”).

The AER driver for each project was extracted from WASP and only projects with a driver considered to be an Augex driver were included (ie. anything other than “Refurbishment”).

Distribution Substations included in these projects were classified as “Upgraded” if they met any of the following conditions:

- Associated with a “Substation - Programmed Refurbishment” work task that is in an Augex project as a result of a decision to augment instead of refurbish; or
- Associated with a unit assembly of “8250” (Remove Rural Transformer) or “8251” (Remove Town Transformer) indicating that the existing transformer was removed and replaced/upgraded; or
- The existing Substation Site asset was linked to the new transformer being ordered indicating that a transformer is being replaced/upgraded;
- The estimate/work pack for the project that the Distribution Substation is a part of has a description that meets one of the following conditions (where % is a wildcard):
    - like “%new sub%”
    - like “%sub%upgrade%”
    - like “%tx%upgrade%”
    - like “%transformer%upgrade%”
    - like “%upgrade%transformer%”
    - like “%upgrade%sub%”
    - like “%upgrade%tx%”

All remaining Distribution Substations from the projects identified were classified as “New”.

Use of Estimated Information

As described above, the transformers category was derived from the transformer description which may be misleading in some cases.

Reliability of Information

The data in this table should be used with caution if it is to be used for benchmarking or decision making purposes.

Cost Metrics

Compliance with Requirements of the Notice

Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. The specific methodology and assumptions made for this table are outlined below.

Methodology & Assumptions

Information was sourced from the “SUMMARY DIRECT COSTS_CAPEX” tab in the CA RIN workfile. A Cognos report is run to split out Capex between Augex and Repex by various asset categories. This report is used to report figures in the Regulatory Accounts.

Regulatory Accounts asset categories are consistently grouped based on model parameters.

Mapping was performed to comply with the requirements of the RIN tables.

- Refer to the “Mapping” tab in the CA RIN workfile. Mapping has been used to link data from the “SUMMARY DIRECT COSTS_CAPEX” tab to the RIN tables based on the judgements of subject matter experts.

Reliability of Information

The data in this table is based on assumptions and estimates so caution should be used when using this for benchmarking or decision making purposes.

Table 2.3.4 – Augex Data – Total Expenditure

Compliance with Requirements of the Notice

Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. The specific methodology and assumptions made for this table are outlined below.

Methodology & Assumptions

The figures in Table 2.3.3.2 have been used to populate Table 2.3.4. Connections is excluded from both tables, with the financial data for Connections captured in Table 2.5.1.

The other assets line is not a balancing item but picks up individual asset categories from the “SUMMARY DIRECT COSTS_CAPEX” tab in the CA RIN workfile.

The total of all line items reconciles back to the “SUMMARY DIRECT COSTS_CAPEX” tab which reconciles back to the Annual Financial RIN for 2015-16.

The expenditure shown for the “Subtransmission Substations, Switching Stations, Zone Substations” and “Subtransmission Lines” rows at the top of Table 2.3.4 do not reconcile to Tables 2.3.1 and 2.3.2, respectively. This is because Tables 2.3.1 and 2.3.2 show expenditure relating to relevant projects which have been closed out during the financial year, whilst Table 2.3.4 shows total expenditure for the financial year for those asset categories.

Reliability of Information

The data is based on underlying assumptions and estimates so caution should be used when using this for benchmarking or decision making purposes.

Worksheet 2.5 – Connections

Table 2.5.1 - Descriptor Metrics

The Notice requires the number, total MVA , total length of HV and LV augmentation and cost of new Underground and Overhead connections and distribution transformers for Rural, Commercial/Industrial & Subdivision premises for the financial period. It also requires the total number of embedded generation sites supplied by overhead/underground along with the total number of projects undertaken by Essential Energy to augment the network to facilitate the installation of embedded generation sites. These projects are broken down into MVA added, number of substations installed, HV augmentation and LV augmentation.

Source of Information

System	Data
Energy	• Premise with Creation Date. • Premise with Residential/Commercial flag. • All embedded generation sites with Application Date and Installation Date.
Smallworld	• Premises with Underground/Overhead flag. • Return premises supplied by substations affected by projects reported from WASP.
WASP	• Substations with Underground/Overhead flag. • List of projects where Essential Energy has financially contributed during the reporting period. Extract included kVA, number of transformers, total Essential Energy cost for the project and project completion date. • List of projects partially funded by a customer during the reporting period.
Planning database (Contestable Works)	• List of customer initiated projects. • Estimated unit costs for transformers based on OH/UG and kVA. Costing included estimated man hours.
Reporting Database (Contestable Works)	• All embedded generation projects completed by Essential Energy in the reporting period.

Methodology & Assumptions

The main assumptions are:

- Essential Energy has no Subdivision assets based on the definition “is intended to capture expenditure in connecting un-reticulated lots or areas.”
- The ratio of known projects is the same as the ratio of unknown projects.
- The ratio of known embedded generation is the same as the ratio of unknown embedded generation.
- Embedded generation with no installed date were installed in the same financial year as the application date.
- Where practical, the determination of Underground/Overhead was derived from GIS Smallworld, otherwise WASP was used.

Number of Connections

Total new connections were determined by the number of premises with a creation date in the financial period.

Expenditure

This is based on the standard methodology adopted for all finance expenditure data in the Category Analysis RIN. Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. The specific methodology and assumptions made for this table are also outlined below.

Overhead/Underground Totals

The Residential/Commercial flag was derived from Energy.

Distribution Substations Installed – for Residential/Commercial and Subdivision Connections

The list of projects from the planning database combined with the customer funded projects from WASP make up the considered projects for these figures. For these projects WASP is used to determine if Essential Energy or an external party paid for the transformer.

For each project, a ratio of Residential to Commercial premises affected by the project was assigned. This ratio was then used to determine the portion of the kVA, number of transformers and costs that would be reported as Residential and Commercial. Total cost is an estimate of the cost to install the transformers plus the estimated man hours to install.

For all projects where the Commercial\Residential status could not be determined, these were deemed “Unknown”. The Unknowns were distributed across all categories based on the ratio of the known projects.

Augmentation HV/LV

The list of projects from the planning database combined with the customer funded projects from WASP make up the considered projects for these figures.

For each project, GIS Smallworld provided the amount of network added or reconductored as a part of the project. A ratio of Residential to Commercial premises affected by the project was also assigned. This ratio was then used to determine the portion of the line length that would be classified as Residential and Commercial.

For all projects where the Commercial/Residential status could not be determined, these were deemed “Unknown”. The Unknowns were distributed across all categories based on the ratio of the known projects.

Embedded Generation

Energy embedded generation data was used as the basis for this data. Where the installation date was blank, the application date was used.

Use of Estimated Information

Essential Energy has used estimated information for premises where Residential/Commercial or Overhead/Underground could not be determined.

An estimate was required in the following cases:

- Where Residential/Commercial could not be determined. Premise data is historical where status data is current. Premises may have become extinct, but exist historically, therefore no Residential/Commercial value can be determined.
- Premises have no network connect therefore no Overhead/Underground value can be determined.
- The project was not found in GIS Smallworld.
- All premises where the Overhead/Underground or Commercial/Residential status could not be determined were deemed “Unknown”. The Unknowns were distributed across all categories based on the ratio of the known premises.
- Essential Energy has used estimated information for embedded generation where Residential/Commercial could not be determined.

Reliability of Information

The data used for determining the overall quantities has been provided previously and has been categorised based on assumptions and estimates.

The data used for determining the quantities has come from three major Essential Energy data repositories where the data is considered reasonably reliable. There were a number of projects that did not exist in GIS Smallworld which had to be averaged, based on assumptions and estimates.

This information should be used with caution for benchmarking or decision making purposes.

The assumptions were made in the best effort to optimise the information at Essential Energy's disposal without compromising the reliability of the figures.

Table 2.5.2 - Cost Metrics by Connection Classification

Compliance with Requirements of the Notice

The Notice requires the total number of embedded generation sites supplied by overhead/underground along with the total number of projects undertaken by Essential Energy to augment the network to facilitate the installation of embedded generation sites. These projects are broken down into MVA added, number of substations installed, HV augmentation and LV augmentation.

Source of Information

System	Data
Energy	• Premise with Creation Date. • Premise with Residential/Commercial flag. • All embedded generation sites with Application Date and Installation Date.
Smallworld	• Premises with Underground/Overhead flag. • Return premises supplied by substations affected by projects reported from WASP.
WASP	• Substations with Underground/Overhead flag. • List of projects where Essential Energy has financially contributed during the reporting period. Extract included kVA, number of transformers, total Essential Energy cost for the project and project completion date. • List of projects partially funded by a customer during the reporting period.
Planning database (Contestable Works)	• List of customer initiated projects. • Estimated unit costs for transformers based on OH/UG and kVA. Costing included estimated man hours.
Reporting Database (Contestable Works)	• All embedded generation projects completed by Essential Energy in the reporting period.

Methodology & Assumptions

The main assumptions are:

- Essential Energy has no Subdivision assets based on the definition "is intended to capture expenditure in connecting un-reticulated lots or areas".
- The ratio of known projects is the same as the ratio of unknown projects.
- The ratio of known embedded generation is the same as the ratio of unknown embedded generation.
- Embedded generation with no installed date was installed in the same financial year as the application date.

- Essential Energy has no complex services.

Expenditure

This is based on the standard methodology adopted for all finance expenditure data in the Category Analysis RIN. Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. The specific methodology and assumptions made for this table are also outlined below.

The expenditure in Table 2.5.2 reflects Connections capital expenditure, with Connections operating expenditure captured within corporate and divisional overheads (non-direct expenditure).

Residential/Commercial & Subdivision Connections

The Residential/Commercial flag was derived from Energy. Essential Energy has deemed it has no complex services.

Embedded Generation

Energy embedded generation data was used as the basis for this data. Where the installation date was blank, the application date was used.

Use of Estimated Information

Essential Energy has used estimated information for embedded generation where Residential/Commercial could not be determined.

Reliability of Information

The data used for determining the overall quantities has been provided previously and has been categorised based on assumptions and estimates. Caution should therefore be used when using this information for benchmarking or decision making purposes.

Worksheet 2.6 – Non-network

Table 2.6.1 - Non-network expenditure

Compliance with Requirements of the Notice

In the following sub headings Essential Energy demonstrates how the information provided is consistent with the requirements of this Notice.

Methodology & Assumptions

This is based on the standard methodology adopted for all finance expenditure data in the Category Analysis RIN. Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. The specific methodology and assumptions made for this table are also outlined below.

Motor vehicles – Opex & Capex

Total Opex was sourced from PeopleSoft to obtain total 2015-16 recoveries. These figures were adjusted to obtain the total recoveries relating to the regulated network business. Figures were then mapped to the RIN categories based on PeopleSoft project type data splits where available.

Total Capex for 2015-16 was sourced from the 2015-16 Regulatory Accounts workfiles. The Non System Regulated Distribution Capex (PNSRDC) report was utilised to allocate the Regulatory Accounts figures into the RIN categories.

Motor vehicles Capex and Opex categories relating to trailers and other fleet are not included in the RIN categories but have been used to reconcile to the total in the Regulatory Accounts, as shown below:

Asset Type	Expenditure Type	$
Trailers	Opex	6,674,720
	Capex	37,365
Other	Opex	4,230,013
	Capex	111,0176

Reconciling item for Table 2.6.1 – Other Fleet Assets

Buildings and Property – Opex & Capex

2015-16 Opex and Capex data was sourced from the 2015-16 Regulatory Accounts workfiles.

Furniture & Fittings – Capex

Data was sourced from the 2015-16 Regulatory Accounts workfiles.

ICT – Opex & Capex

2015-16 Opex data was sourced from the 2015-16 Regulatory Accounts. Figures were mapped to the RIN categories based on mapping provided by SMEs within the ICT department. The Opex assumptions for the category splits were:

- Labour is 80% recurrent, 11% non-recurrent and 9% client device;
- Maintenance is 100% recurrent;
- Administration is 100% recurrent; and

- Professional services is 100% non-recurrent.

Capex data was sourced from the 2015-16 Regulatory Accounts and mapped to the Category Analysis RIN based on mapping provided by SMEs within the ICT department. These category splits were based on project data from Cognos.

Use of Estimated Information

As mentioned above, some assumptions have been made concerning RIN splits and allocations. As such the data is considered to be a best estimate.

Reliability of Information

Given the underlying assumptions and methods used to derive this data, caution should be exercised when using this for benchmarking or decision making purposes.

Table 2.6.2 - Annual Descriptor Metrics – IT & Communications Expenditure

Compliance with Requirements of the Notice

In the following sub headings Essential Energy demonstrates how the information provided is consistent with the requirements of this Notice.

Source of Information

System/Source	Used for
ICT's Configuration Management Database (CMDB)	Extract used for determining number of devices as at 30 June 2016.
End of Year Dashboard Report from PeopleSoft HR for 2015-16	Determining employee numbers
PeopleSoft HR Database	Determining user numbers

Methodology & Assumptions

The following method and assumptions have been made when compiling this data:

Employee Numbers

Employee numbers were derived by taking the year end number of Essential Energy's FTEs from PeopleSoft by department and multiplying them by the Standard Control percentage for each of those departments, with each Standard Control percentage arrived at by following the instructions set out in the CAM. The Standard Control employees for each department were then added together to achieve a company-wide total. This proportion of total Standard Control employees as a percentage of total company employees was then used to apportion ICT user numbers and device numbers in the sections below.

User Numbers

Total user numbers have been based on the number of employees recorded in PeopleSoft that were active as at 30 June 2016. This number reflects the number of IT system log-in accounts as Essential Energy's standard practice is to allocate system access accounts to all employees as they are engaged. This also includes agency staff and contractors. The total user number was then multiplied by the company-wide Standard Control percentage derived under the Employee Numbers section above.

Number of Devices

The device numbers include laptops, desktops, tablets and smartphones only and are based on information within the ICT Configuration Management Database (CMDB). The 30 June 2016 total has been multiplied by the Standard Control percentage derived under the Employee Numbers section above.

Assumptions

The main assumption is that the Standard Control percentage calculated using instructions from the CAM accurately represents the Standard Control portion of devices and user numbers.

Use of Estimated Information

The underlying data which provides total company numbers for employees, users and devices is accurate, and as such, the data provided for this table is considered accurate. However, as mentioned above, assumptions underlie the calculation of the Standard Control portion of those items.

Reliability of Information

Given the underlying assumptions and methods used to derive this data, caution should be exercised when using this for benchmarking or decision making purposes.

Table 2.6.3 - Annual Descriptor Metrics – Motor Vehicles

Compliance with Requirements of the Notice

In the following subheadings Essential Energy demonstrates how the information provided is consistent with the requirements of this Notice.

Source of Information

Information was gathered from several sources, namely:

- PeopleSoft
- SGFleet
- 2015-16 Regulatory Accounts workfiles

Methodology & Assumptions

The following assumptions have been made when compiling this data:

- Average data from the SGFleet database is considered to be representative of the network;
- Non-motorised fleet have been excluded as shown below:

Trailers	Number purchased	0
	Number in fleet	1,184
	Proportion of total fleet expenditure allocated as regulatory expenditure (%)	97.80%
Other	Number purchased	6
	Number in fleet	610
	Proportion of total fleet expenditure allocated as regulatory expenditure (%)	97.80%

Average Kilometres Travelled by Vehicle Type

The SGFleet 2015-16 Annual Report was used to extract the average kilometres per vehicle type.

Number Purchased by Vehicle Type

The number of purchases by vehicle type was listed in the SGFleet 2015-16 Annual Report.

Number Leased by Vehicle Type

The number of leased vehicles by vehicle type was extracted from the SGFleet 2015-16 Annual Report.

Number in Fleet by Vehicle Type

The SGFleet 2015-16 Annual Report was used to extract the number of vehicles by type.

Proportion of Total Fleet Expenditure Allocated as Regulatory Expenditure

This proportion has been taken from the 2015-16 Regulatory Accounts workfiles and has been calculated in accordance with Essential Energy's CAM.

Use of Estimated Information

Certain assumptions underlie the data used above, particularly surrounding the Regulatory Accounts workings.

Reliability of Information

On the whole, the data in this table is considered to be reliable, though consideration should be given to the assumptions underlying the data if it is to be used for benchmarking or decision making purposes.

Worksheet 2.7 - Vegetation management

Table 2.7.1 - Descriptor Metrics by Zone

Compliance with Requirements of the Notice

In this section we demonstrate how the information provided is consistent with the requirements of this Notice.

Source of Information

- WASP
- Field survey 2011-12
- Smallworld

Background

Statutory obligations in NSW

In this section we will demonstrate that in NSW minimum vegetation clearance standards are mandated via the statutory instruments and the Code of Practice Electricity transmission and distribution asset management, February 20091, as shown in Figure 2-1.

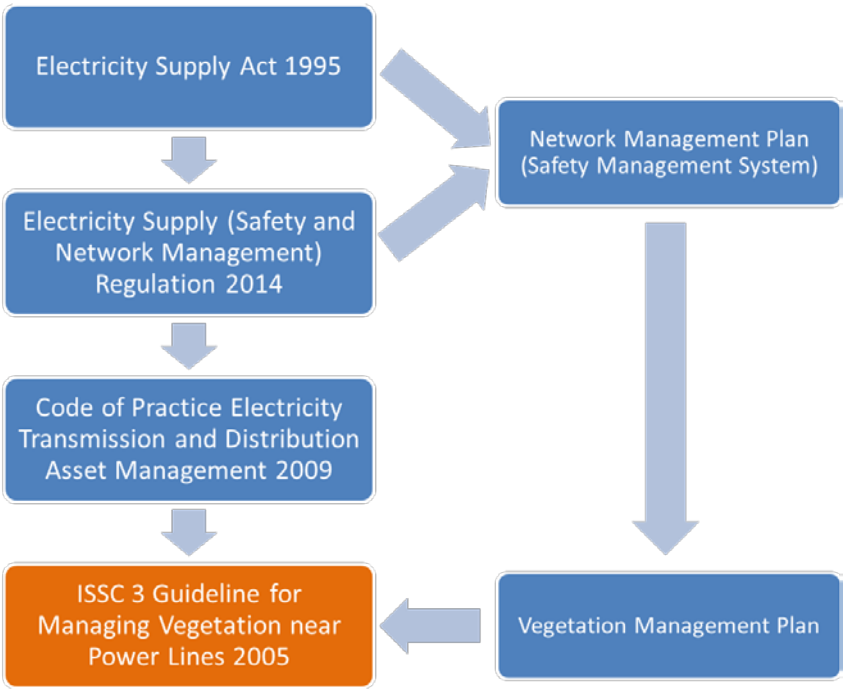

Figure 2-1: Statutory obligations – path to ISSC3

The Electricity Supply Act 1995 (NSW) obligates Essential Energy "to deliver a safe and reliable supply of electricity" (clause 3(a)) and "to promote and encourage the safety of persons and property in relation to the generation,

[1] NSW Resources and Energy, *Code of Practice Electricity transmission and distribution asset management*, February 2009

transmission, distribution and use of electricity" (clause 3(b)). The Act states that it may make regulations in relation to "the development and implementation by network operators of plans designed to ensure the safe operation of their transmission or distribution systems" (clause 191(g1)) and "the removal or trimming of trees by distribution network service providers" (clause 191(h)).

The Electricity Supply (Safety and Network Management) Regulation 2014 (NSW) obligates Essential Energy to "take all reasonable steps to ensure that the design, construction, commissioning, operation and decommissioning of its network (or any part of its network) is safe" (clause 5). The regulation requires Essential Energy to prepare a safety management system that relates to vegetation management, in particular the "management of bushfire risk relating to electricity lines and other assets of the network operator's network that are capable of initiating bushfire" (clause 7(1)(b)(iv)). The safety management system must be "in accordance with AS 5577 or with any other code or standard that the Secretary may, by written notice given to the network operator, nominate" (clause 7(1)(a)).

The 2014 regulation replaced the Electricity Supply (Safety and Network Management) Regulation 2008 on 1 September 2014. The 2008 regulation similarly required Essential Energy to prepare a network management plan that relates to vegetation management and to "take into account such codes, standards or guidelines as the Director-General, by notice in writing to the network operator, requires to be taken into account in the development and implementation of the chapter" (clause 13(1)).

In 2010, the Director-General directed that Essential Energy is required to incorporate the Code of Practice - Electricity transmission and distribution asset management, February 2009 in its network management plan. Although this directive was issued while the 2008 Regulation was in place, the obligation to comply continues under the 2014 regulation: "Any act, matter or thing that, immediately before the repeal of the Electricity Supply (Safety and Network Management) Regulation 2008, had effect under that Regulation continues to have effect under this Regulation" (clause 44(1) – 2014 regulation).

The Code of Practice - Electricity transmission and distribution asset management, February 2009 is intended to:

- … promote common practices in electricity transmission and distribution to embed in the State's electricity supply infrastructure, its operation and maintenance, features which are generally accepted as appropriate for meeting the needs of the public in terms of safety, access and network impacts.[2]
- support the streamlining of the regulatory regime under The Act by providing guidance on achieving the minimum standard of electrical safety to customers, the public and industry workers, contractors and their employees. This Code shall be followed unless there is an alternative course of action which achieves the same or better outcomes.[3]

The Code sets out the maintenance requirements for the network including requirements for vegetation management.

A system of maintenance for overhead lines, their structures and components shall consider: … tree management programmes designed to:

- ensure public safety,
- minimise the risk of fires caused by contact between trees and overhead lines,
- reduce the number of interruptions to supply caused by trees, and
- protect the electricity distributor's assets from damage[4].

[2] NSW Resources and Energy, *Code of Practice Electricity transmission and distribution asset management*, February 2009, p. 5

[3] NSW Resources and Energy, *Code of Practice Electricity transmission and distribution asset management*, February 2009, p. 5

[4] NSW Resources and Energy, *Code of Practice Electricity transmission and distribution asset management*, February 2009. p. 20

The Code references ISSC 3 Guideline for Managing Vegetation near Power Lines 2005 (ISSC3) for detailed guidance on vegetation management maintenance works.

ISSC3 was developed for application in NSW and "seeks to provide guidance to network operators and the community generally in the safe and environmentally responsible management of vegetation near power lines by integrating community, safety and environmental values"[5]. ISSC3 specifies minimum vegetation clearances, as well as additional allowances and "clear to sky" requirements for bushfire prone areas.

To comply with the Act, the Regulations and the Code, Essential Energy developed appropriate Network Management Plans (now referred to as the Safety Management Systems in the 2014 regulation), and its Vegetation Management Plan (CEOP8008) based on ISSC3 is a requirement of those plans. The Vegetation Management Plan is a key instrument in the Bushfire Risk Management Plan required by statute. Essential Energy's forecast vegetation management expenditure is based on maintaining vegetation in accordance with the Vegetation Management Plan and is, therefore, considered to be related to delivering a prudent volume of work activities.

Methodology & Assumptions

Route Length within Zone

Route lengths in each Zone are overhead route lengths only as underground route lengths were considered irrelevant from a vegetation management perspective.

Zone totals are made up of the sum of the length of their depot areas.

There is a portion of the route lengths that could not be apportioned to either Urban or Rural and is classified as "other". A further extract was made from WASP to determine overall numbers of urban and rural spans and therefore their ratios. These ratios were applied to the "other" portion of the route lengths to provide a full KMs and Spans breakdown for the entire network.

The pole count extract from WASP was derived using the following logic – Urban/Rural is an attribute against a pole and is based on if a pole lies within an urban area in Smallworld (urban areas are classified as areas that contain Interconnected Low Voltage). Each pole is then attributed with the Vegetation Zone it sits in, which produces the table used to determine the rural/urban ratios.

The pole counts, whilst close, are not an exact match to asset age profile data because asset age profile comes from the WASP system instead of the Smallworld system. As the purpose is to determine the urban/rural split, the difference in pole count should not have an impact.

The total number of zones has reduced since the previous year, with various zones being merged. This has no bearing on the calculation of the route line length data as the underlying network has not changed or reduced in size. Only the boundaries between zones have altered.

Number of Maintenance Spans

The number of spans per Zone as per the above category definitions were sourced from the Smallworld system by depot area and then consolidated into their respective Zone.

The percentage vegetated is based on completed scoped vegetation maintenance areas in each Zone from the 15/16 maintenance program and split into rural and urban maintenance areas. The percentage is calculated as total defects reported in these maintenance areas divided by total poles in the maintenance area.

We are seeing a large increase in overall numbers of spans requiring work due mostly to a change in contract model and scoping profile detailed within said contract model. With the new-style contracts in place, scoping is now the responsibility of the vegetation contractors and there is now the requirement to scope and cut urban area LV service lines and vegetation that is overhanging the network (which previously had not been a focus of in-house scoping or cutting). ETS, in particular, took up the option of cutting "Clear to Sky" which in itself has resulted in a large increase of vegetation defects.

Total Length of Maintenance Spans

The total route lengths of each Zone (methodology outlined above) multiplied by the vegetated percentage of the network used in the "Number of Maintenance Spans" metric above, for each Zone.

[5] Industry Safety Steering Committee, *ISSC 3 Guideline for managing vegetation near power lines*, December 2005, p. 1

Length of Vegetation Corridors

The percentage of the network was calculated using all rural vegetation maintenance areas that had maintenance carried out on them in 2015-16. A maintenance area was considered to be a corridor if the work mix carried out in that area contained a combination of trimming and ground clearance work.

From this data it was deemed that 53% of the rural network was corridor and so this percentage was applied to the total length of the network from the "Route Length within Zone" metric.

Average Number of Trees per Urban & CBD Vegetation Maintenance Span

The vegetation density for all years is based on field survey data from the 2011/12 financial year. 30 vegetation maintenance areas were surveyed across the Essential Energy urban network with the sample made up of vegetation maintenance areas from each of the six vegetation maintenance zones.

Average frequency of the cutting cycle

For the 2015-16 financial year the average cutting cycle is based on average periods between cyclic cut dates per VMA from 2011-12 to 2015-16 (based on archival WASP data for years 2011 to 2015 and VIMS data for the current financial year). If the VMA has only been cut once or twice in this period we have used a lookup matrix which supplies an estimated cyclic frequency based on past history.

Use of Estimated Information

The table contains estimated information as described in the Methodology & Assumptions section above.

Reliability of Information

The colour coding system has been used in the RIN template to indicate the level of confidence in each of the cells completed.

Given the underlying assumptions and methods used to derive this data, caution should be exercised when using the data for benchmarking or decision making purposes.

Table 2.7.2 – Expenditure Metrics by Zone

Compliance with Requirements of the Notice

This is based on the standard methodology adopted for all finance expenditure data in the Category Analysis RIN. Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. The specific methodology and assumptions made for this table are also outlined below.

Methodology & Assumptions

- Geographical areas have been split from Zone 1 to Zone 6 via a mapping exercise, ie. from RIN categories to geographical zones.
- Service subcategories have been extracted from PeopleSoft for 2015-16.
- Project types provided for the zone split were on a direct cost basis.
- Vegetation Operations Management, Delivery & Performance and Compliance & Stakeholder departments (departments 891, 815 and 781 respectively), were proportionately allocated across Zones 1 to 6 based on direct dollar spend. The resulting proportions were then used to apportion the total direct costs as reported in the 2015-16 Regulatory Accounts.
- Hazard Tree and Ground Clearance in the financials were based on a percentage of those tasks that were completed as a proportion of all vegetation defects that were completed in 2015-16.

Use of Estimated Information

The data in this table is all considered to be estimated, as outlined in the methodology section above.

Reliability of Information

The data in this table is based on assumptions and estimates so caution should be exercised when using it for benchmarking or decision making purposes.

Table 2.7.3 – Descriptor Metrics Across All Zones – Unplanned Vegetation Events

Compliance with Requirements of the Notice

The following sections outline how Essential Energy has ensured that the information provided is consistent with the requirements of the Notice.

Source of Information

- TotalSAFE
- Microsoft Excel
- Tableau

Methodology & Assumptions

Vegetation Caused Fire Data

In the Essential Energy TotalSAFE system on the Fire Report Form, the reporting person chooses from the available options in the drop down list for Secondary Cause & Contributory Cause.

There are a set group of options for Vegetation fires to identify whether the offending vegetation was in all probability inside or outside clearances at the time.

For consistency, the investigation officer completes the form on behalf of field staff and selects the appropriate code details from discussions with field staff and photos, where provided.

Data from TotalSAFE is exported to a Microsoft Excel Master register of all fire incidents. This register is used for complete analysis and reporting (monthly and yearly).

A sample of the 2015-16 data from the Tableau software is used to analyse data in the Microsoft Excel exported file from TotalSAFE.

Use of Estimated Information

On occasions the distance of vegetation to conductors is clear, but on other occasions it is less clear and requires personal judgements based on available evidence. For example, in the case of a fallen tree on the line, one can be confident of the distance the tree was standing from conductors prior to falling. In the case of windborne branches and debris it is an estimate at best.

Reliability of Information

Confidence in the data is moderate. The data in this table includes estimates so caution should be used when using this for benchmarking or decision making purposes.

Worksheet 2.8 – Maintenance

Table 2.8.1 – Descriptor Metrics for Routine and Non-Routine Maintenance

Compliance with Requirements of the Notice

The following sections outline how Essential Energy has ensured that the information provided is consistent with the requirements of the Notice.

The information provided is based on all assets owned by Essential Energy as well as privately owned assets where they are managed and maintained by Essential Energy.

Data has then been filtered to only include those assets that are "in service".

Source of Information

Several systems and planning documents have been queried. These systems and documents are listed below along with the data sets obtained from those systems.

Maintenance Activity	System	Data set
Numerous	PeopleSoft Financial System	
Numerous	WASP	• Count of year end assets from the Asset Register and maintenance events from the work scheduling module. • Streetlight volume data from COGNOS Report Studio.
Numerous	Smallworld	Route length of overhead and underground assets
Numerous	TotalSAFE	
Numerous	Electricity Network Incident Failure Database (ENI)	
Public lighting maintenance	Asset Strategy Development	Average pole replacement cost
SCADA & Network Control Maintenance	Primavera PeopleSoft	Capital project data OPEX, M&R and F&E
SCADA & Network Control Maintenance	Service Manager	Historic Asset Replacements/Asset Failure
SCADA & Network Control Maintenance	Diagnostic Software	Historic & current radio asset data
SCADA & Network Control Maintenance	ROE device list	Historic & current IP asset data

Methodology & Assumptions

The asset quantity for most asset types is based on information from WASP and Smallworld.

Accurate age data within the various asset systems is considered incomplete at best. For this reason current average age data has been assessed based on the best available data. It is assumed that historical replacement and growth rates have not been sufficient to suspend the average age of most assets ensuring a gradual increase in average

age dependant on the individual asset. A basic calculation has been used to estimate the historical average age. Data for this algorithm is approximate and should not be considered accurate.

Pole Top, Overhead Line & Service Line Maintenance

Pole Tops & Overhead Lines

- Assets at year end are based on a WASP count of poles (both distributor owned and distributor maintained private poles) that were recorded in WASP.
- The quantity inspected/maintained represents a count of all corrective maintenance tasks (which are not covered in this table) that have been completed as operating expenditure outside the normal zone substation boundary fencing.
- Average age has been estimated as pole average age. Data for this algorithm is approximate and should not be considered accurate.
- The maintenance cycle is assumed to be the inspection cycle as required. Corrective maintenance is normally carried out within six months of inspection.

Service Lines

- Assets at year end are based on a count of customers. The average customer count was determined by calculating the average at the start and end of the financial year, as requested in the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER. This is different to Essential Energy's process which determines total billed days for the financial year and divides by the days in the year or alternatively provides a count at the end of the period. Data has been sourced from an internal reporting system and existing query, via Spotfire, which extracts data from the Energy/Peace billing system. Unmetered customers have been extracted from the Energy/Peace system through internal reports.
- Quantity inspected/maintained provides a count of all service related corrective maintenance tasks that have been completed as operating expenditure.
- Average age has been determined using a number of factors, including pole age, premise start date and service cable estimated age. Data for this algorithm is approximate and should not be considered accurate.

Pole Inspection & Treatment

- Assets at year end are based on a WASP count of distributor owned and distributor maintained private poles designated as "in service".
- Assets inspected include all WASP pole inspection tasks that were completed for the year. Each task includes the required activities based on pole age and condition. This may include excavation, drilling, visual inspection and routine treatment of decay or termites.
- Average age has been based on pole average age from the age profile in Table 5.2.1. Data for this algorithm is approximate and should not be considered accurate.

Overhead Asset Inspection

- Assets at year end are taken from the GIS Smallworld system and represent the total route length of the overhead network excluding LV services (but including streetlighting). All service statuses have been included.
- The asset quantity inspected is reported as the total route length. This has been calculated based on a quarter of total route length being inspected by the asset inspector each year, plus urban assets being inspected as part of the thermovision program, rural overhead assets being inspected by aerial patrols every year, as well as subtransmission live line inspection on rural radial feeders. The inspections include visual inspection of conductors, crossarms, insulators, transformers, and other overhead equipment.
- The average age is based on assumed conductor age from the age profile in Table 5.2.1. Data for this algorithm is approximate and should not be considered accurate.

- Subtransmission Live Line Inspection: This program targets rural radial subtransmission feeders and allows for close approach pole top inspection using an elevated work platform and specialised live line practices. Approximately 31,000 poles are inspected over an eight year cycle with an average age assumed to be 38 years.

- Annual Thermovision Inspection: A detailed thermovision inspection of targeted urban high voltage network is completed each year. Although accurate recording of completed inspections has been sporadic in the past, approximately 100,000 pole top connections are assessed annually. Inspection numbers documented in the table are taken from WASP but are considered unreliable due to past reporting issues. Average age of the specific assets is assumed to be 32 years.

Network Underground Cable Maintenance: by Voltage

- Assets at year end are taken from the Smallworld system and cover the total circuit length of the underground network (excluding underground services as these are generally maintained by the customer).
- Assets maintained includes a count of all corrective work tasks involving underground assets that were recorded and completed in the respective year, then grouped by voltage.
- The maintenance cycle is shown as four years to correspond with the inspection cycle. Although work tasks are prioritised to various timeframes for completion, the lodgement and scheduling is performed in conjunction with the inspection.
- Average age is based on assumed cable age from the age profile in Table 5.2.1. Data for this algorithm is approximate and should not be considered accurate.

Network Underground Cable Maintenance: By Location

- Assets at year end are taken from the Smallworld system and cover the total circuit length of the underground network (excluding underground services as these are generally maintained by the customer). Total circuit length is shown for non CBD as Essential Energy does not have any underground in an area classified as CBD.
- Assets maintained includes all corrective work tasks involving underground assets that were recorded and completed in the respective year, then grouped by voltage.
- The maintenance cycle is shown as four years to correspond with the inspection cycle. Although work tasks are prioritised to various timeframes for completion, the lodgement and scheduling is performed in conjunction with the inspection.
- Average age is based on assumed cable age from the age profile in Table 5.2.1. Data for this algorithm is approximate and should not be considered accurate.

Distribution Substation Equipment & Property Maintenance

Distribution Substation Transformers

- Assets at year end in this category include all distribution substation transformers and regulators (both overhead and enclosed).
- Quantity inspected/maintained includes a count of corrective work tasks (“Substation - Replace Tank” and “Regulator - Replace Tank”).
- Average age is based on a weighted average of the estimated transformer and regulator ages.
- The maintenance cycle is shown as four years to correspond with the inspection cycle. Although work tasks are prioritised to various timeframes for completion, the lodgement and scheduling is performed in conjunction with the inspection.

Distribution Substation Switchgear

- Assets at year end in this category include all distribution substation switches (both for overhead and enclosed substations). Where actual substation switch information was not available, a consistent algorithm was used to assess the number. This allowed 2.5 switches per overhead substation and 6 switches per enclosed substation. This conservative assumption was based on 1 high voltage switch and an average of 1.5 low voltage units per overhead substation, while enclosed substations allowed for 2 high voltage switches and 4 low voltage units.
- Average age has been estimated as the average of the substation and the transformer age. Data for this algorithm is approximate and should not be considered accurate.

Distribution Substation Other Equipment

Earth Integrity Testing: This four yearly-program ensures the integrity of both high and low voltage earthing systems supporting those assets not available for the regular asset inspection program. Approximately 30,000 earth sites are tested over a four year cycle with an average age of 29 years.

Distribution Substation Property

- Assets at year end in this category represent a count of all distribution substations (both overhead and enclosed).
- Quantity inspected/maintained is a count of all distribution substation corrective tasks (excluding transformer, regulator and switchgear tasks included above).
- Average age is based on the estimated substation site age. Data for this algorithm is approximate and should not be considered accurate.

Zone Substation Equipment Maintenance

Transformers – Zone Substation

- Asset quantity at year end represents all Essential Energy owned Zone Substation power transformers, and does not include regulators, zone substation auxiliary transformers, step up transformers, or SWER isolating transformers.
- Quantity maintained/inspected represents the sum of the number of minor/major preventative work tasks completed during the 2015-16 financial year and the number of zone substations recorded as inspected in WASP multiplied by the number of transformers divided by the number of zone substations.
- Average age is based on an estimate of age for those transformers with an installation date recorded in WASP.
- Inspection cycle (as for all other assets) – Power Transformers are not “Inspected” as an entity. Inspection is a whole-of-substation exercise relevant to all assets. Zone Substations are inspected either monthly, bi-monthly or quarterly depending on various substation attributes. The figure of 0.205 represents (in years) the weighted average zone substation inspection interval.
- Maintenance cycle – four years is the current minor maintenance interval for power transformers.

Other Equipment

- Asset quantity at year end represents a simple sum of all “In Service” assets across all asset categories apart from Power Transformers and tap changers.
- Quantity maintained/inspected represents the sum of the number of minor/major preventative work tasks completed during the financial year and the number of zone substations recorded as inspected in WASP multiplied by the number of other assets divided by the number of zone substations.
- Quantity inspected/maintained represents a sum of all scheduled maintenance work tasks for the year from WASP, including all regularly maintained asset categories.
- Average age represents a weighted average of the individual asset category average ages. Individual category averages were taken as the average age of “In Service” assets, calculated from the commissioning date (where

known). The fact that a large number of records in some categories do not have a commissioning date recorded, means that the averages will be skewed to a slightly newer figure, given that the older sites would, as a general rule, be the ones missing a commissioning date.

- Inspection cycle represents the average substation inspection frequency. Zone Substations are inspected either monthly, bi-monthly or quarterly depending on various substation attributes. The figure of 0.205 represents (in years) the weighted average zone substation inspection interval.
- Maintenance cycle represents the weighted average of the individual asset category average maintenance intervals.

Zone Substation Property Maintenance

- Asset quantity represents the number of Zone Substation site records from WASP with a service status of "In Service" and a type of either "Zone Substation", "Switching Station" or "Subtransmission", but *not* "Regulator" or "FI Plant".
- Asset quantity inspected/maintained represents a quarter of the asset quantity figure above, based on a typical maintenance cycle of four years. The sum of the quantity of zone substations recorded as inspected in WASP, the quantity of zone substations where fire equipment maintenance was recorded, the property maintenances recorded and the number of zone substation property inspections based on the property maintenance contract.
- Average age is based on the substation ages calculated from commissioning dates (where present). The fact that a large number of site records do not have a commissioning date recorded, means that the average will be skewed to a slightly newer figure, given that the older sites would, as a general rule, be the ones missing a commissioning date.
- The inspection cycle represents the average substation inspection frequency. Zone Substations are inspected by electrical staff either monthly, bi-monthly or quarterly depending on various substation attributes. This has been based on the cycle for power transformers, as this typically determines the substation inspection cycle. The figure represents the average of the weighted average zone substation inspection interval by electrical staff, and routine property inspections by contractors.
- The maintenance cycle is shown as four years to correspond with typical maintenance cycles for Zone Substation properties.

Public Lighting Maintenance

- Bracket data is not collected in the current asset management system, so there is no reference to volumes and/or costs within this data.
- Assets at Year End - Data was taken from the end of year asset inventory WASP extract. These reports include all devices except metered and/or quarantined devices. These devices were excluded for the following reasons:
    - Quarantined lights do not contain enough information to determine the luminaire size.
- Metered lights are the responsibility of the owner for maintenance and replacement, and the energy consumption is not calculated using the Type7 Unmetered Billing System.
- Assets Inspected/Maintained **-** This number is the sum of all routine and non-routine streetlight maintenance tasks in 2015-16. This number does not include pole inspections.
- Average Age of Asset Group - The current average age of the streetlight asset group has been calculated as follows:
    - Extract from WASP providing a count of streetlights by road categorisation, grouped by year.
    - This data was then used to calculate the average age of installed lights – sum of installed age / number of lights installed.
- The inspection and maintenance cycle reflects the period between inspections or planned maintenance activities.

SCADA & Network Control Maintenance

- Asset quantity at year end - Assets captured in this category are those which have a sole purpose of providing SCADA & Network Control functionality to Zone Substations. Assets used to provide communication services to pole top devices have not been included in this section and will be captured elsewhere.
- Asset quantity inspected/maintained **-** Essential Energy has included all assets in this category that have either been physically inspected or maintained via remote diagnostic systems. Many assets are not physically inspected, but their condition is continually assessed via remote diagnostics software, alerting to any degradation in service or asset condition.
    - Average age of asset group - Data is based on year of purchase for the asset and averaged across all asset categories.
    - In the case of RTUs (field devices), the methodology for the current reporting period differs slightly to that used in previous RIN reports. The basis of calculation has now been modified to include the firmware version of the older devices, thus attaining a more reflective age profile for these largely legacy devices. Newer devices have much better records with respect to purchase/commissioning dates.

Protection Systems Maintenance

- Asset quantity represents all “in service” distribution reclosers owned by Essential Energy.
- Quantity inspected/maintained represents those tasks directly related to maintaining distribution recloser sites and was taken from WASP. As the visual inspection cycle for these assets is performed annually, the maintenance cycle is also assumed to be annual.
- Average age is based on the recloser or the recloser site estimated age. Data for this algorithm is approximate and should not be considered accurate.

Other Inspection Programs

All routine inspection programs (not listed separately above) are included within this group. The inspection cycle has been stated as two years, however there is significant variation between the different programs. These WASP work tasks include the following programs:

- Pit and Pillar Inspection - Population includes all underground pits and pillars (HV and LV) that are routinely inspected for safety and performance defects. This program has been progressively ramping up as resource constraints allowed and will be reviewed for cycle duration after a complete cycle.
- Critical Equipment Inspection - This program is also in its early stages and follows a risk based approach. It allows for a targeted group of critical assets, including major distribution substations, to be highlighted and closely inspected every year. The inspection incorporates activities such as maximum demand reporting, partial discharge and thermovision detection, clearances and oil leaks. Approximately 1,200 sites have been selected for an annual cycle. The average age of these assets is approximately 23 years.
- Enclosed Substation Inspection - This is a four-yearly intensive inspection program that allows isolation of kiosk, chamber and ground-mount substations that cannot be adequately assessed by regular asset inspection practices. A relatively consistent population of approximately 6,103 with an average age of 18 years has been assumed. Inspected units vary each year due to specific scheduling constraints but an overall cycle of four years is assumed.
- Annual Regulator and Recloser Inspection - This program has historically ensured a detailed six-monthly inspection of all distribution reclosers and regulators. The program was recently reviewed with regard to current constraints and modified to only include those assets that are not connected to remote communication facilities and performed annually. The combined average age of these assets has been assessed as 15 years.
- A number of other miscellaneous inspections have also been included in this category, however they do not represent a significant percentage and so are not outlined in detail.

Use of Estimated Information

The data in this table is largely estimated using the various assumptions noted above.

Reliability of Information

Assumptions and estimates underlie aspects of the data in this table so caution should be applied when using this data for benchmarking or decision making purposes.

Table 2.8.2 – Cost Metrics for Routine & Non-Routine Maintenance

Compliance with Requirements of the Notice

The following sections outline how Essential Energy has ensured that the information provided is consistent with the requirements of the Notice.

Source of Information

This is based on the standard methodology adopted for all finance expenditure data in the Category Analysis RIN. Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. Individual maintenance activities have been captured through relevant management reports and estimated where necessary. Total expenditure has been reconciled back to the 2015-16 Regulatory Accounts. Any specific methodology and assumptions utilised for this table are outlined below.

Methodology & Assumptions

- 2015-16 Regulatory Accounts associated with Essential Energy's maintenance expenditure were used as the base data.
- These accounts were then sorted into either routine or non-routine expenditure and were then mapped to corresponding maintenance activities in the RIN table.
- Where an account covered multiple maintenance activities, a pro-rata system was used to assign the expenditure based on the directly mapped accounts.
- Where no accounts were able to be directly mapped to inspection/maintained activities a unit rate system was used to assign expenditure based on like-activities with known expenditure.
- Where maintenance activities contained units both for inspections and maintenance, the routine versus non-routine expenditure was applied pro-rata based on those units.

Use of Estimated Information

Wherever possible, the data splits within this table are based on actual financial management reporting. Where this is not possible, high level assumptions and estimation have been used to provide a relatively accurate response to the required tables. Estimation has been developed based on actual tasks undertaken and a derived unit rate.

Reliability of Information

Maintenance expenditure at a total level aligns to the 2015-16 Regulatory Accounts, however the split into the various categories is based on assumptions and estimation. Caution should be applied when using this information for decision making or benchmarking purposes.

Worksheet 2.9 - Emergency Response

Table 2.9.1 – Emergency Response Expenditure (Opex)

Compliance with Requirements of the Notice

This information is based on all transactions associated with Emergency Response and major event days Essential Energy has encountered. The data relates to Fault & Emergency (F&E) expenditure only.

Source of Information

Data has been sourced from:

- 2015-16 Regulatory Accounts
- PeopleSoft Query for expenditure against project type Fault & Emergency (excluding overheads)
- Chart of Accounts with COA Mapping – EssentialNet

Methodology & Assumptions

- Total Fault & Emergency costs were sourced from the annual Regulatory Accounts.
- Coding was cross-checked with the annual Regulatory Accounts to ensure a consistent approach.
- Major Events Days Costs are based on day of incident and two days after incident, as major event days would usually take longer than a 24-48 hour period to resolve.

2015-16 total emergency response expenditure has dropped from 2014-15 as a result of a change in the accounting treatment of poles and crossarms changed under fault and emergency conditions. These were previously expensed, whereas they are now capitalised. Refer to Essential Energy's revised Capitalisation Policy, contained in Attachment 7 to the 2015-16 Annual Reporting RIN.

Use of Estimated Information

The data splits within this table are based on high level assumptions and the data is, therefore, considered to be estimated.

Reliability of Information

Expenditure at the total level is considered reliable; however, the allocation of costs to specific Major Event Days is based on assumptions and estimates so caution should be used when using this for benchmarking or decision making purposes.

Worksheet 2.10 – Overheads

Table 2.10.1 – Network Overheads Expenditure & Table 2.10.2 – Corporate Overheads Expenditure

Compliance with Requirements of the Notice

The following sections outline how Essential Energy has ensured that the information provided is consistent with the requirements of the Notice.

Essential Energy capitalises a component of its overhead expenditure. Capitalisation of overheads is governed by CEOP2416 – Operational Procedure: Asset Capitalisation. There have been no material changes in capitalisation policy from the prior year.

Source of Information

The data in this table is based on the standard methodology adopted for all finance expenditure data in the Category Analysis RIN. Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. The specific methodology and assumptions made for this table are also outlined below.

Methodology & Assumptions

- Master file of financial data is prepared as described in section *3.*
- COGNOS dataset of Operating expenditure has been extracted and reconciled to relevant management accounts to ensure its validity.
- Overheads were split into the requested cost categories using PeopleSoft project type data broken down into resource categories and RIN subcategories, as described below.
- Departments were allocated to the mandatory and discretionary categories disclosed within the table. This is based on their current primary functions.
- Aggregate Overheads were allocated across the mandatory and discretionary categories disclosed within the table proportionately based on the Total Network Overhead and Total Corporate Overhead estimated "Indirect Cost Pools" respectively.
- Alternative Control overheads relate to Public Lighting, Metering and Ancillary Network Services.

Use of Estimated Information

The data splits within this table are based on assumptions and the data is, therefore, considered to be estimated.

Reliability of Information

Given the underlying assumptions and use of estimated data in this table, caution should be exercised when using it for benchmarking or decision making purposes.

Worksheet 2.11 – Labour

Table 2.11.1 - Cost Metrics per Annum

Compliance with Requirements of the Notice

The following sections outline how Essential Energy has ensured that the information provided is consistent with the requirements of the Notice.

Source of Information

Data has been sourced from:

- Labour Opex and Capex file from the Budgeting and Forecasting department which details by department the split of labour costs by direct and overhead, as well as the split by Standard Control, Alternate Control, Unregulated Services and Water. This file uses the 2015-16 CAM rates.
- FTE Reports for June 2016 and June 2015.
- Personal Data files for June 2016 and June 2015, showing annual remuneration and hourly rate data per employee.
- Agency Staff reports for June 2016 and June 2015 showing labour hire staff.
- Monthly Overtime Report for June 2016 showing year to date overtime dollars and hours.
- 2016 Working Hours file from Finance showing available working hours calculated as part of the budgetary process.
- RIN classification file from HR, showing FTEs classified by categories required in Tables 2.11.1 and 2.11.2.
- 2016 Stand Down Occurrences file from HR.
- Board Labour Report for June 2016.

Methodology & Assumptions

Main Assumptions

- The 2015-16 ASL number is assumed to be the average of the 2014-15 and 2015-16 year end staff numbers converted to standard control numbers by way of department percentages derived from the Labour Opex and Capex file.
- It is assumed that the average productive work hours for Ordinary Time labour is standard per ASL. This data is not calculated at a more detailed ASL-specific level. It equates to the available hours as calculated in the Working Hours file. The average productive work hours per ASL equates to average productive work hours for Ordinary Time plus average overtime hours per ASL.
- A standard control percentage has been calculated for each department using the Labour Opex and Capex file and this has been applied to labour costs and units.

Total Labour Cost

- The 2015-16 Ordinary Time labour cost per department was taken from the Labour Opex and Capex file and split into Corporate, Network Overheads and Direct Network standard control labour costs using the departmental percentages derived from this file.
- Other staff-related costs by department were taken from the Labour Opex and Capex file. Restructuring and Redundancy provision costs were removed. The remaining costs were then multiplied by the relevant percentages to convert to the standard control amounts.
- Overtime wages and oncosts were calculated from the Labour Opex and Capex file. Overtime hours were taken from the Monthly Overtime Report for June 2016. These were multiplied by the relevant percentages to convert to the standard control amounts by department.

Calculation of Costs and Hours Split Between the Different Labour Categories in the RIN

- Total ordinary labour costs and overtime costs by department were calculated.
- The average remuneration per FTE was pivoted to derive the remuneration by department and RIN labour category.
- The total labour costs by department were split by RIN labour category using the weighting of the remuneration by department and RIN category analysis.
- The applicable ordinary time hourly rate per ASL was used as the hourly rate for labour hire.

RIN Classification

Each employee was assigned their RIN classification by HR Operations.

Employees were categorised into RIN categories using mapping logic based on organisational hierarchy and remuneration code (for Executive and Senior Managers on Contract), Employee class (Apprentices) and Workforce Planning Categories as used in Essential Energy's Public Sector workforce planning external reporting. The results were reviewed and results aligned to the RIN categories where required.

The following table outlines the logic used by HR Operations:

WFP Categories	RIN	Mapping Logic	Rule
Admin	Support	Job Family	WFP Category
Apprentice	Apprentice	Empl Class	Employee Class
Executive Manager	Exec Manager	L2 & L3 & CONEMP	Hierarchy + Contract
Management	Manager	Job Family	WFP Category
Non Trade	Unskilled Worker	Job Family	WFP Category
Prof Spec	Professional	Job Family	WFP Category
Senior Manager	Senior Manager	L4 & L5 & CONEMP	Hierarchy + Contract
Technical	Skilled Electrical	Job Family	WFP Category
Trades	Skilled Electrical	Job Family	WFP Category

ASL Numbers

- The year end FTEs for 2015-16 were taken from the FTE report for June 2016. Using the RIN classification file from HR, FTEs were assigned their applicable labour classification.
- The average FTE numbers were calculated by deriving an average of the closing balance of June 2015 and June 2016 by department.
- The applicable departmental standard control percentage was applied to the average numbers to derive the standard control ASL numbers.
- The average year end labour hire data was calculated by deriving an average of the closing balance of June 2015 and June 2016 by department.

Stand Down Occurrences

Data for the 2016 year regarding stand down occurrences was obtained from HR. The data was analysed by employee ID, labour classification and department. The applicable standard control percentage per department was applied to give the number of stand down occurrences by labour category.

Use of Estimated Information

The information in this table is considered to be based on actual data but with estimated splits applied to derive the required information.

Further details regarding estimation are described in the Methodology & Assumptions section above.

Reliability of Information

Given the underlying assumptions and estimates made in this data, caution should be applied if using the data for benchmarking or decision making purposes.

Table 2.11.2 - Descriptor Metrics

Compliance with Requirements of the Notice

The following sections outline how Essential Energy has ensured that the information provided is consistent with the requirements of the Notice.

Source of Information

Data has been sourced from:

- Table 2.11.1.
- Monthly Overtime Report for June 2016 showing year to date overtime dollars and hours.

Methodology & Assumptions

Average Productive Work Hours Ordinary Time per ASL and Hourly Rate per ASL

- It is assumed that average productive work hours per ASL equates to the available working hours as shown in the Working Hours file for 2016.
- The total standard control cost for ordinary time and labour hire was divided by the total productive work hours for ordinary time to calculate the hourly rate per ASL per labour category.
- It is assumed that employee and labour hire have the same costs.

Average Productive Work Hours Overtime per ASL and Hourly Rate per ASL

- Overtime hours per FTE was taken from the Monthly Overtime Report for June 2016. The overtime cost was taken from the Labour Opex and Capex file.
- The standard control percentages per department were applied to extract the standard control element.
- The RIN labour categories were added to the analysis.
- The data was then pivoted to show the total overtime dollars and hours per labour category.
- The average productive overtime work hours per ASL were derived by dividing overtime hours by the ASL numbers as per Table 2.11.1.
- The hourly rate per ASL was calculated by dividing the overtime dollars by overtime hours.

Use of Estimated Information

The information in this table is considered to be based on actual data but with estimated splits applied to derive the required information.

Further details regarding estimation are described in the Methodology & Assumptions section above.

Reliability of Information

Given the underlying assumptions and estimates made in this data, caution should be applied if using the data for benchmarking or decision making purposes.

Worksheet 2.12 - Input tables

Table 2.12.1 – Input tables

Compliance with Requirements of the Notice

The following sections outline how Essential Energy has ensured that the information provided is consistent with the requirements of the Notice.

Source of Information

The data in this table is based on the standard methodology adopted for all finance expenditure data in the Category Analysis RIN. Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. The specific methodology and assumptions made for this table are also outlined below.

Methodology & Assumptions

- Vegetation Management was split into the requested cost categories using PeopleSoft project type data broken down into resource categories and zones.
- Routine Maintenance was split into the requested cost categories using PeopleSoft project type data broken down into resource categories and RIN subcategories.
- Non Routine Maintenance was split into the requested cost categories using PeopleSoft project type data broken down into resource categories and RIN subcategories.
- Overheads were split into the requested cost categories using PeopleSoft project type data broken down into resource categories and RIN subcategories. Overheads have been lumped into *"*Other*"* cost categories based on the time and resources available to dissect the data.
- Augmentation was sourced from the Annual Reporting RIN and split into the cost categories using PeopleSoft project type data broken down into resource categories and RIN subcategories.
- Connections were split into the requested cost categories using PeopleSoft project type data broken down into resource categories and RIN subcategories.
- Major event days (within Emergency Response) were split into the requested cost categories using PeopleSoft project type data broken down into resource categories and RIN subcategories. Sourced from Table 2.9.1 of the Category Analysis RIN. Major storms was used as the balancing item for the remaining Emergency Response spend.
- Public Lighting was split into the requested cost categories using PeopleSoft project type data broken down into resource categories and RIN subcategories.
- Metering was split into the requested cost categories using PeopleSoft project type data broken down into resource categories and RIN subcategories.
- Replacements was sourced from the Annual Reporting RIN and split into the cost categories using PeopleSoft project type data broken down into resource categories and RIN subcategories.
- Non Network Expenditure has been lumped into "Other" costs. Data was sourced from Worksheet 2.6 of the Category Analysis RIN.

Use of Estimated Information

The data splits within this table are based on assumptions and the data is, therefore, considered to be estimated.

Reliability of Information

Given the underlying assumptions and estimates made in this data, caution should be applied if using it for benchmarking or decision making purposes.

Worksheet 4.1 - Public lighting

Table 4.1.1 - Descriptor Metrics Over Year

Compliance with Requirements of the Notice

The following sections outline how Essential Energy has ensured that the information provided is consistent with the requirements of the Notice.

Source of Information

- Data was extracted from WASP as at 1 July 2016.
- This data was filtered to exclude Metered, Private and Quarantined lights and to only include In Service lights. These devices were excluded for the following reasons:
    - Quarantined lights do not contain enough information to determine the luminaire size.
    - Metered and Private lights are the responsibility of the owner for maintenance and replacement.

Methodology & Assumptions

The individual device types were counted from the WASP installed data as at 1 July 2016, based on the AEMO load table classification for each light.

Use of Estimated Information

All information has been sourced from WASP and is considered to be actual data. The data contains no estimates.

Reliability of Information

The data in this Table is considered to be reliable.

Table 4.1.2 - Descriptor Metrics Annually

Compliance with Requirements of the Notice

The following sections outline how Essential Energy has ensured that the information provided is consistent with the requirements of the Notice.

Source of Information

- The streetlight data was sourced from WASP extracts.
- GSL Breaches, Payments & Customer Complaints volume data was obtained from the Customer Affairs Business Unit. The data was extracted from the CMS database for 2015-16.
- Cost data in this table is based on the standard methodology adopted for all finance expenditure data in the Category Analysis RIN. Refer to section *3 Financial Data* for the overall Basis of Preparation on finance data prepared for multiple tables in the RIN. The specific methodology and assumptions made for this table are also outlined below.

Methodology & Assumptions

The following assumptions have been made to classify the devices and task types for the purpose of this reporting:

Description	Definition
Major Road Lighting	Luminaires with wattage 150 or higher
Minor Road Lighting	Luminaires with wattage less than 150
Routine Maintenance/Replacement	Work of a planned nature (routine inspections, bulk programs, night patrols)
Non-Routine Maintenance/Replacement	Unplanned work performed by Essential Energy
Public Lighting	Installed Type 7 unmetered lights that are billed through the Unmetered Billing System

Light Installation Volume & Expenditure

- Volumes were extracted from the WASP Asset History for 2015-16.
- The streetlight data was categorised between major and minor road using the wattage assumption above.
- There are no costs associated with new light or pole installations as these are customer funded and deemed as gifted assets.

Light Replacement Volume & Expenditure

- Replacement volumes were extracted from the WASP Work Task records for 2015-16. Volumes will include internally and externally funded replacements where the asset is an Essential Energy asset.
- The streetlight data was categorised between major and minor road using the wattage assumption above.
- Total cost for light replacement includes only internally funded work, representing Essential Energy funded replacement expenditure. Customer funded program expenditure has been excluded.

Light Maintenance Volume & Expenditure

- Maintenance volumes were extracted from WASP Work Task records for 2015-16. This will include inspections, spot maintenance work, and bulk lamp replacement programs.
- The streetlight data was categorised between major and minor road using the wattage assumption above.
- Number of poles installed includes the volume of dedicated streetlight pole inspections completed during the period.
- Total cost is the direct operating expenditure associated with maintenance programs for streetlights.

Quality of Supply

Mean Days

- This number was derived from Cognos report PR25 YTD Customer Reported June 2016 Graph. This report identifies the total number of customer reported tasks received, calculates the total number of days taken to repair between the reported date and the completed date (excluding weekends and public holidays), and then provides the average.

Volume of GSL Breaches, Payments & Customer Complaints

This data was obtained from the Customer Affairs Business Unit and the data was extracted from the CMS Database.

Use of Estimated Information

All volume information has been sourced from WASP and is considered to be actual data. The data contains no estimates.

Reliability of Information

The data in this table is considered to be reliable.

Table 4.1.3 - Cost Metrics

Compliance with Requirements of the Notice

The following sections outline how Essential Energy has ensured that the information provided is consistent with the requirements of the Notice.

Source of Information

- The number of Replacement and Maintenance work tasks for 2015-16 were obtained from WASP work task records.
- Financial information was provided at a transaction level for the relevant public lighting project types. This data was provided by Finance.

Methodology & Assumptions

The main assumptions for this table are:

- Average unit rates are applied as financial information is not available at a light type.

Light Installation – Major & Minor Road

There are no costs associated with any light or pole installations as these are deemed as gifted assets.

Light Replacement – Major & Minor Road

- Replacement Work Task records by light type and road type for 2015-16 were extracted from WASP.
- Material costs were sourced from a number of areas being Procurement Inventory Listing and both the CAPEX and PTRM SLUOS models.
- Internal labour costs were derived from the PTRM SLUOS model and include plant and labour.
- Contractor maintenance and replacement rates were advised by Project Manager at commencement of new contract period.

Light Maintenance

- Maintenance Work Task records by light type and road type for 2015-16 were extracted from WASP.
- Contractor maintenance and replacement rates were advised by Project Manager at commencement of new contract period.
- Bracket data is not collected in the current asset management system, so there is no reference to costs within this data.
- All material costs were sourced from either Procurement Inventory Listing, CAPEX or PTRM SLUOS models.
- Where material costs were not available, costs of similar size materials was used.

Use of Estimated Information

The data in this table contains assumptions and estimates.

Reliability of Information

Given the underlying assumptions and estimates made in this data, caution should be applied if using the data in the table for benchmarking or decision making purposes.

Worksheet 4.2 – Metering

Table 4.2.1 – Metering Descriptor Metric

Compliance with Requirements of the Notice

In the following subheadings Essential Energy seeks to demonstrate how the information provided is consistent with the requirements of this Notice.

Source of Information

EDDIS: This system is used by metering services to store and process meter readings and meter registry information pertaining to chapter 7 of the NER.

Methodology & Assumptions

- Meter population volumes for 2015-16 have been produced through a query from the EDDIS database, with the query providing total number of meters by type.
- Note: Meter population numbers are duplicated in the RIN template with details provided by subcategory of Single Phase and Multi Phase Meter Populations and also by subcategory of Current Transformer and Direct Connect Meter Populations. The sum of Single Phase and Multi Phase meters should equal the sum of Current Transformer and Direct Connect Meter populations.

Use of Estimated Information

The data in this table is considered to be actual data other than the duplication of meter numbers noted above.

Reliability of Information

Given the data duplication within this table, caution should be applied if using the data for benchmarking or decision making purposes.

Table 4.2.2 - Cost Metrics

Compliance with Requirements of the Notice

In the following subheadings Essential Energy seeks to demonstrate how the information provided is consistent with the requirements of this Notice.

Source of Information

- EDDIS: This system is used by metering services to store and process meter readings and meter registry information pertaining to chapter 7 of the NER.
- Reports and budgetary information from PeopleSoft. This data was aligned to the Annual Reporting RIN based on mapping provided by SMEs.

Methodology & Assumptions

Reporting for Metering is in line with how the alternative control data for Type 5 & 6 meters will be recorded in the future.

Meter Purchase

- Financial reports from PeopleSoft have been used for 2015-16. This data was aligned to the Annual Reporting RIN based on mapping provided by SMEs.

Meter Testing

- Meter testing includes the regulatory compliance testing of meters undertaken by Essential Energy in accordance with the NER.
- Information for 2015-16 is based on financial reports from PeopleSoft. This data was aligned to the Annual Reporting RIN based on mapping provided by SMEs.

Meter Investigation and Special Meter Reading

- These are all zero as they have been covered by Network Operation in Section 4.3 Fee Based Services.

Scheduled Meter Readings

- Information for Type 6 readings for 2015-16 is based on financial reports from PeopleSoft. This data was aligned to the Annual Reporting RIN based on mapping provided by SMEs.

New Meter Installs

- All data for this section is zero as new meter installs are either conducted by Accredited Service Providers or, where an installation of metering with Current Transformers is performed, by Metering Services on a quote for service basis and therefore not included.

Meter Replacement

- Meter replacement includes the pro-active replacement of meters that have failed to meet compliance under the NER. Information for 2015-16 is based on financial reports from PeopleSoft and information from the Network Development team who are managing contracts to replace the meters with an external provider. This data was aligned to the Annual Reporting RIN based on mapping provided by SMEs.

Meter Maintenance

- Meter maintenance includes the routine maintenance of meters, including replacement of meters that have failed in service.
- Data for 2015-16 is based on Metering project type data in PeopleSoft, reconciling back to the Annual Regulatory Accounts.

Remote Meter Reading

- Remote meter reading costs are included in the Type 5 meter reading costs provided under Scheduled Meter Reading. While these meters are set up as Type 5 meters, they are read remotely due to technical difficulties in probe reading these meters. These costs are estimated based on the volume of sites and the reading frequency. This data was aligned to the Annual Reporting RIN based on mapping provided by SMEs.

Other Metering

- Other metering includes redundancies for Meter Reading and Meter Provision, with the balance being costs incurred in the Meter Data Agency section. These costs were obtained from PeopleSoft reports.

Use of Estimated Information

This table contains estimated information as noted in the Methodology section above.

Reliability of Information

Given the assumptions underlying data in this table, caution should be applied if using the data for benchmarking or decision making purposes.

Worksheet 4.3 - Fee-based services & Worksheet 4.4 - Quoted services

Table 4.3.1 – Cost Metrics for Fee-Based Services & Table 4.4.1 – Cost metrics for quoted services

Compliance with Requirements of the Notice

Essential Energy has provided 2015-16 costs and volumes for each of the Ancillary Service Fees it has charged.

Source of Information

- Service orders related to B2B transactions were extracted from Essential Energy's Yambay (Power on Fusion) dispatch system.
- Services related to contestable construction works has been extracted from Essential Energy's Contestable Works Management System.
- Other services have been sourced directly from the managers responsible for the processes.
- Expenditure was sourced from PeopleSoft Financials and COGNOS.

Methodology & Assumptions

Essential Energy's existing service orders /PTJs have been classified as outlined in the table below:

Service Sub-Category	PTJ Type
Special Meter Read	B2B 915 Special Read B2B Check Read
Move in Meter Read	B2B Re-en Read Request
Move out Meter Read	Final Reading Only
Meter Test – 1st Meter	B2B Meter Test
Off Peak Conversion	B2B Change Controlled Load B2B Change Timeswitch
Disconnect - site visit	B2B Disc Non Pay/Fuse B2B Disc Non Pay/Pole (status incomplete)
Reconnect – site visit	B2B Re-en after DNP B2B Re-en After Hours Re-en After DNP AH – SO (status incomplete)
Disconnect/Reconnect – Disconnection Complete	**B2B Disc Non Pay/Fuse**
Disconnect/Reconnect – Technical Disconnect	**NOT USED**
Vacant Premise – Reconnect/Disconnect	B2B Final Read/Fuse
Vacant Premise – Reconnect/Disconnect (site visit only)	B2B Final Read/Disc at Pole B2B Final Read/Fuse
Disconnect – Pillar/Pole	B2B Disc Non Pay/Pole

Service Sub-Category	PTJ Type
	B2B Final Read/Disc at Pole
Reconnect – outside business hours	B2B Re-en After Hours Re-en After DNP AH - SO

- The wasted visit volumes were calculated using the “Completion Status” from Yambay. PTJs with an “Incomplete” status were counted as wasted visits.
- Financial information was extracted from PeopleSoft at a transaction level and able to be summarised at a project level.
- Where financial data was unavailable at the level of reporting, the financials have been apportioned using the transaction volumes.
- For the remaining fee-based services Essential Energy has estimated actual service volumes, from the historical revenue recorded in its General Ledger wherever possible. The business has supplemented and verified these estimates using secondary business systems such as the “Contestable Works Database”. Where actual volumes could be extracted at a fee level, those volumes were applied to Essential’s estimated costs.

Use of Estimated Information

The data in this table is chiefly comprised of estimated information, as noted in the Methodology & Assumptions section above.

Reliability of Information

Given the assumptions and estimations underpinning the data in this table, caution should be applied if using the data for benchmarking or decision making purposes.

Worksheet 5.2 - Asset Age Profile

Table 5.2.1 – Asset Age Profile

Poles

Compliance with Requirements of the Notice

The information provided lists the number of poles owned by Essential Energy as well as privately owned poles which are maintained by Essential Energy.

Source of Information

This data has been obtained from Essential Energy's WASP database using SQL and grouping of data in Excel.

Methodology & Assumptions

SQL Logic:

- Both Essential Energy and privately owned poles have been included. Private assets are included as these are poles that Essential Energy inspects and in some cases maintains.
- Includes assets categorised in WASP as "Poles".
- In Service poles only have been included.
- Staked Poles have been determined by those In Service poles that have had a completed "Pole – Reinstate" work task recorded against them (excluding those poles that have been replaced since reinstatement), as well as those poles with a reinforcement attribute but prorated from 1990-91 to 2004-05.
- Staked poles have only been recorded in their own specified row and have not been included in the other pole voltage/material groupings.
- Dedicated street lights have not been included in the pole counts.
- Age is determined from the pole's "Date Installed". Those Poles that do not have a "Date Installed" have been prorated across the existing asset age profile.
- Pole Material is determined from the pole's "Pole Material" and "Pole Type" attributes as follows:

Pole Material	Pole Type	Material
Blank	Blank	Wood
Blank	Copper Chrome Arsenic	Wood
Blank	Low Temperature Creosote	Wood
Blank	Pigment Emulsified Creosote	Wood
Blank	Pressure Impregnated	Wood
Unknown	Blank	Wood
Unknown	Copper Chrome Arsenic	Wood
Unknown	Low Temperature Creosote	Wood
Unknown	Pigment Emulsified Creosote	Wood
Unknown	Pressure Impregnated	Wood
Timber	Blank	Wood
Timber	Copper Chrome Arsenic	Wood
Timber	Copper Chrome Napthenate	Wood
Timber	Low Temperature Creosote	Wood
Timber	Pigment Emulsified Creosote	Wood
Timber	Pressure Impregnated	Wood

Concrete		Concrete
Steel		Steel
Tower		Steel
Aluminium		Steel
Stobie		Concrete
Composite		Other

- Voltage is determined from the pole's "Highest Voltage" and "Pole Function" attributes as follows:

Pole Function	Highest Voltage	Voltage
Bollard Pole	Blank	Bollard – None
HV/LV Pole	Blank	11kV
HV Pole	Blank	11kV
LV Pole	Blank	<=1kV
Street Light Column	Blank	<=1kV
Transmission/HV Pole	Blank	66kV
Transmission/HV/LV Pole	Blank	66kV
Transmission/LV Pole	Blank	66kV
Transmission Pole	Blank	66kV
	Bollard – None	Bollard – None
	6.35	11kV
	6.6	11kV
	11	11kV
	22	22kV
	12.7	12.7kV
	19.1	19.1kV
	33	33kV
	66	66kV
	132	132kV

- If the asset voltage is blank or "Unknown", then the asset's maintenance area primary voltage is used instead (determined from Smallworld data).
- If the asset voltage is "Bollard – None", it has been included in "Other".
- If the pole material is "Composite", it has been included in "Other".

Use of Estimated Information

Essential Energy has used estimated information for the pole material when there is no material listed for the pole. The estimation of using the pole type and pole function gives a fairly accurate estimation. Any poles without a "Date Installed" have been prorated across the existing asset age profile.

Staked Poles have been determined using a combination of work tasks and attributes against the pole; however, this data is only available after 2004. Prior to this, data has been prorated from 1990-91 to 2004-05.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under "Poles" in Table 5.2.1 over the period requested.

Reliability of Information

The reliability of the data in this table is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations that have been used. Caution should be applied if using this data for benchmarking or decision making purposes. In particular, the reliability of the ages of staked poles is questionable due to the lack of data.

Overhead Conductors

Compliance with Requirements of the Notice

The data in this table has been prepared in accordance with the requirements of the Notice.

Source of Information

System	Data
WASP	• Substations Site - Asset label, Date Constructed
Smallworld	• Cable - Date Installed Purpose, Operating Voltage, Service Status, Owner, Nominal Length, Geometry (both Centreline and Actual Centreline combined), LV Service Type, Parent Substation • Substation Site – Asset Label, Location

Methodology & Assumptions

Smallworld Cables used in the analysis were filtered by:

- Purpose = Overhead
- Owner = Essential Energy
- LV Service type not equal to “Service”
- Service Status = all

The Date Installed was converted into financial year. Lengths were summed by financial year and regulatory voltage category, ie. ≤1kV, and entered into the “quantity by year” cells of the table.

- An estimate date installed was unachievable for a total of 13,364km of line – this length was spread across the age classes prior to 2004 according to the age distribution for each voltage category.

Use of Estimated Information

Date Installed (Smallworld Cable)

Essential Energy has used a combination of actual and estimated information for the Date Installed attribute of lines. The probability of a record having a valid Date Installed value is greater in the years from 2003 onwards. Although legacy data has been used to fill in these values, valid dates are less likely to be available for lines installed by pre-amalgamation distributors. The collection of this information in the field is difficult.

Assumptions:

- Various aging techniques have been undertaken by the business to age unknown sections of the network. These undertakings have been adopted in an effort to age the network as accurately as possible.

Reliability of Information

The reliability of the data in this table is dependent on the accuracy of the data within the GIS Smallworld database and the assumptions and estimations that have been used. Caution should be applied if using this data for benchmarking or decision making purposes.

Underground Cables

Compliance with Requirements of the Notice

The data in this table has been prepared in accordance with the requirements of the Notice.

Source of Information

System	Data
WASP	• Substations Site - Asset label, Date Constructed
Smallworld	• Cable - Date Installed Purpose, Operating Voltage, Service Status, Owner, Nominal Length, Geometry (both Centreline and Actual Centreline combined), LV Service Type, Parent Substation • Substation Site – Asset Label, Location

Methodology & Assumptions

Smallworld Cables used in the analysis were filtered by:

- Purpose = Underground
- Owner = Essential Energy
- LV Service type not equal to “Service”
- Service Status = all

The Date Installed was converted into financial year. Lengths were summed by financial year and regulatory voltage category, ie. ≤1kV, and entered into the “quantity by year” cells of the table.

- An estimate date installed was unachievable for a total of 1,173km of line – this length was spread across the age classes prior to 2004 according to the age distribution for each voltage category.

Use of Estimated Information

Date Installed (Smallworld Cable)

Essential Energy has used a combination of actual and estimated information for the Date Installed attribute of lines. The probability of a record having a valid Date Installed value is greater in the years from 2003 onwards. Although legacy data has been used to fill in these values, valid dates are less likely to be available for lines installed by pre-amalgamation distributors. The collection of this information in the field is extremely difficult.

Assumptions:

- Various aging techniques have been undertaken by the business to age unknown sections of the network. These undertakings have been adopted in an effort to age the network as accurately as possible.

Reliability of Information

The reliability of the data in this table is dependent on the accuracy of the data within the GIS Smallworld database and the assumptions and estimations that have been used. Caution should be applied if using this data for benchmarking or decision making purposes.

Service Lines

Compliance with Requirements of the Notice

The data in this table has been prepared in accordance with the requirements of the Notice.

Source of Information

System	Data
WASP	• Substations Site - Asset label, Date Constructed
Smallworld	• Cable - Date Installed Purpose, Operating Voltage, Service Status, Owner, Nominal Length, Geometry (both Centreline and Actual Centreline combined), LV Service Type, Parent Substation • Service Point – Premise Join

Methodology & Assumptions

Cables used in the analysis:

- Purpose = all
- Operating Voltage = LV
- Owner = Essential Energy
- LV Service type = Service
- Service Status = all

In GIS Smallworld, premises are located at an object known as a Service Point. The Smallworld Cable (underground or overhead) connecting the Service Point to the network is attributed as “Service”.

- For each Service Point find the following information:
  - Date Installed of Service Cable (estimated if required – see below)
  - Customer Type Residential or Business
- Convert the date installed into financial years. Count the cables by financial year and enter into the “quantity by year” cells of the table for the appropriate category.

NOTE:

Essential Energy does not have any Services that are not low voltage.

Essential Energy does not have any Services that are complex.

Essential Energy does not have any Services of type subdivision.

All Essential Energy Commercial & Industrial customers are low voltage and are therefore connection complexity = Simple.

Use of Estimated Information

Date Installed (Smallworld Cable)

Essential Energy has estimated the date installed value for services. The location of services has not been uniformly populated in the system until recent years. The Customer, Premise, Substation group has been connecting the Service Point to the network in bulk over the past decade – date installed information was not included as part of this process. The collection of this information in the field is both difficult and practically impossible.

Date installed determined the dates in the below categories and if found, assigned the date in the order of priority below:

- Known Service Cable Date
- Land Parcel Registration Date
- Service Pole Installation Date
- Substation Installation Date

Any Service Cable that could not be allocated a date was spread across the age classes according to the age distribution.

Assumptions:

- The land parcel registration date is the date the service was installed and has not been subsequently replaced.
- The service pole installation date is the date the service was installed and has not been subsequently replaced.
- The substation installation date is the date the service was installed and has not been subsequently replaced.

Customer Type

Information regarding the customer type that the cable is servicing is not maintained against the cable object in GIS Smallworld. Therefore this information was obtained from the premise information in Peace. If a Service Point in GIS Smallworld had at least one residential Premise joined to it, it was considered residential.

Reliability of Information

The reliability of the data in this table is dependent on the accuracy of the data within the GIS Smallworld database and the assumptions and estimations that have been used. Caution should be applied if using this data for benchmarking or decision making purposes.

Transformers

Compliance with Requirements of the Notice

The information provided includes distribution transformers owned by Essential Energy that are currently in use.

Source of Information

This data has been obtained from Essential Energy's WASP database using SQL and grouping of data in Excel.

Methodology & Assumptions

SQL Logic:

- Total = [Distribution Transformers] + [Zone Substation Auxiliary Transformers] + [Zone Substation Power Transformers] + [Distribution Regulating Transformers] + [Zone Substation Regulators (single phase)] as determined below:

Distribution Transformers

- Only Substation Sites with an Owner = "Essential Energy".
- All Transformers that are currently In Service (in use).
- Includes SWER Isolators and Step Up/Down Transformers. This varies to Table 3.5 Physical Assets.
- Voltage has been determined from the asset's "Primary Voltage".
- kVA has been obtained from the Substation Site's "Total kVA". If this is not available, then kVA has been derived as follows (note this has only been required in approximately 2% of cases):
    - If Substation Site "Total kVA" is blank, then use sum of children Transformer "kVA".
    - If Substation Site "Total kVA" and children Transformer "kVA" fields are blank, then use Substation Site "Phases" as follows:

      3 phase = 63kVA

      1 phase = 10kVA
    - If Substation Site "Total kVA" and children Transformer "kVA" fields are blank and Substation Site "Phases" is blank, then use Substation Site "Construction Type" as follows:

Pad/Kiosk Substation = 500kVA

Chamber Substation = 1000kVA

Ground Substation = 1000kVA

All others (e.g. Pole Substation) = 10kVA

- If kVA is still undetermined then kVA is estimated as:

Ground or Chamber Substation < 22kV	<=60kVA
Ground or Chamber Substation >= 22kV	<=15MVA
All Others	<=60kVA

- For larger transformers (Ground and Chamber >= 22kV), the kVA determined above has been converted to MVA by dividing by 1000 for input into the RIN template.

- Mounting Type was determined based on "Construction Type" as follows:
  - "Pole Substation","2 Pole Platform Substation","Supported Platform Substation" = Pole Mounted
  - "Ground Substation","Chamber Substation" = Ground Outdoor/Indoor Chamber Mounted
  - "Pad/Kiosk Substation" = Kiosk Mounted

If "Construction Type" is blank, then "Pole Mounted" was assumed (note this was only required in < 0.5% of cases).

- Phases was determined based on the asset Phases attribute as follows:
  - "HV1" = Single Phase
  - Else Multiple Phase

- Year has been obtained from the most recent "Date Manufactured" from the Substation Site's associated children transformer(s). If this is not available, then Year has been derived as follows:
  - Substation Site "Date Constructed".
  - Those Substation Sites that do not have a "Date Constructed" or a transformer with a "Date Manufactured" have been prorated across the existing asset age profile.

- Distribution transformers in stores have not been included.

Zone Substation Auxiliary Transformers

- ZS Auxiliary Transformers with a Service Status of "In Service".
- Only ZS Auxiliary Transformers with an Owner = "Essential Energy".
- All ZS Auxiliary Transformers have been categorised as "Ground Outdoor/Indoor Chamber Mounted".
- All ZS Auxiliary Transformers have been categorised as "Multiple Phase".
- Voltage has been obtained from the ZS Auxiliary Transformer's "Primary Voltage". If "Primary Voltage" is blank, then "<22Kv" has been assumed. This was only required in < 0.5% of cases.
- kVA has been obtained from the ZS Auxiliary Transformer "Rating (kVA)". If this is not available, then kVA has been derived as follows:
  - If ZS Auxiliary Transformer "Rating (kVA)" is blank, then use "Primary Voltage" as follows:

    < 22kV = ">60kVA and <=600kVA"

    >= 22kV = "<=15MVA"
  - If "Primary Voltage" is blank or "Unknown", then a kVA of ">60kVA and <=600kVA" has been assumed.

- For larger transformers (Ground and Chamber >= 22kV), the kVA determined above has been converted to MVA by dividing by 1000 for input into the RIN template.

- Year has been obtained from the ZS Auxiliary Transformer's "Year of Manufacture". If this is not available, then Year has been derived as follows:
  - If ZS Auxiliary Transformer "Year of Manufacture" is blank, then use the "Commissioning/Install Date".
  - Those ZS Auxiliary Transformers that do not have a "Year of Manufacture" or "Commissioning/Install Date" have been prorated across the existing asset age profile.

Zone Substation Power Transformers

- ZS Power Transformers with a Service Status of "In Service".
- Only ZS Power Transformers with an Owner = "Essential Energy".
- Excludes ZS Power Transformers with a Type of "Regulator" or a Usage of "Spare" (these are included in "Other").
- All ZS Power Transformers have been categorised as "Ground Outdoor/Indoor Chamber Mounted".
- All ZS Power Transformers have been categorised as "Multiple Phase".
- MVA has been obtained from the "Maximum Rating (MVA)" attribute. If blank, it is assumed to be 5 MVA (note that this has occurred in <1% of cases).
- Year has been obtained from the ZS Power Transformer's "Year of Manufacture". If this is not available, then Year has been derived as follows:
  - If ZS Power Transformer "Year of Manufacture" is blank, then use the "Date Installed" attribute from the ZS Power Transformer.
  - If ZS Power Transformer "Date Installed" is not available, they were prorated across the existing asset age profile.

Distribution Regulating Transformers

- Recorded in "Other".
- Only Regulating Transformers with an Owner = "Essential Energy".
- Regulating Transformers with a Service Status of "In Service".
- Year has been obtained from the Regulating Transformer's "Date Manufactured". If this is not available, then Year has been derived as follows:
  - If Regulating Transformer "Date Manufactured" is blank, then use the "Date Constructed" attribute from the Regulator Site.
  - If Regulator Site "Date Constructed" is not available then they were prorated across the existing asset age profile.
- Voltage has been determined from the asset's "Primary Voltage". If blank it is assumed to be <22kV.
- Phases are determined as:
  - HV1, LV1, SWER = Single Phase
  - HV3, LV2, LV3 = Multiple Phase

Zone Substation Regulating Transformers (Single Phase)

- Recorded in "Other".
- ZS Regulating Transformers (Single Phase) with a Service Status of "In Service".
- Only ZS Regulating Transformers (Single Phase) with an Owner = "Essential Energy".

- All ZS Regulating Transformers (Single Phase) have been categorised as “Ground Outdoor/Indoor Chamber Mounted”.
- All ZS Regulating Transformers (Single Phase) have been categorised as “Single Phase”.
- Year has been obtained from the ZS Regulating Transformer’s “Year of Manufacture”. If this is not available, then Year has been derived as follows:
    - If ZS Regulating Transformer’s “Year of Manufacture” is blank, then use the “Date Installed” attribute from the ZS Power Transformer.
    - If ZS Regulating Transformer’s “Date Installed” is not available, they were prorated across the existing asset age profile.

Use of Estimated Information

- Essential Energy has used estimated information when there is no “Date Constructed” for the Substation Site or “Date Manufactured” on the child Transformer(s) for Distribution Substations.
- Essential Energy has used estimated information when there is no “Year of Manufacture” or “Commissioning/Install Date” for the ZS Auxiliary Transformers as per the existing age profile.
- Essential Energy has used estimated information when there is no “Total kVA” for the Substation Site as per the logic detailed above. This only occurred in 2% of cases. The methodology used to estimate the kVA in these instances is considered to provide a reasonable approximation and was determined using averages and most common kVA by Substation Type.
- Essential Energy has used estimated information when there is no “Rating (kVA)” for the ZS Auxiliary Transformers as per the logic detailed above. This only occurred in approximately 17% of cases. The methodology used to estimate the kVA in these instances is considered to provide a reasonable approximation and was determined using averages and most common kVA by Voltage.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under “Transformers” in Table 5.2 over the period requested.

Reliability of Information

The reliability of the data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations that have been used. It has been determined that the data is reasonably reliable for all items, however caution should be applied if using this data for benchmarking or decision making purposes.

Switchgear

Compliance with Requirements of the Notice

The information provided lists Switchgear assets that are owned by Essential Energy and are currently in use. Switchgear includes Reclosers, Sectionalisers, Disconnecting Links, Fuses, Air Break Switches, Load Break Switches, Fuses/Switches that are part of Substations and Zone Substation Circuit Breakers.

Source of Information

This data has been obtained from Essential Energy’s WASP database using SQL and grouping of data in Excel.

Methodology & Assumptions

These figures were determined in four parts:

1. Extract data/age profile for Distribution Switchgear currently recorded in WASP.
2. Extract data/age profile for Zone Substation Circuit Breakers recorded in WASP.
3. Extract data/age profile for Zone Substation Switches recorded in WASP.

4. Estimate the number of Fuses/Switches that are part of Substations (both pole mounted and ground/enclosed substations) that are not discretely recorded in WASP.

The results from these queries/estimations were then combined. The logic for each of these four parts is detailed below:

1. Extract data/age profile for Distribution Switchgear currently recorded in WASP

SQL Logic:

- Circuit Breakers = assets with a category of "Recloser Site".
- Switches = assets with a category of "Sectionaliser Site", "Disconnecting Link", "Air Break Switch", "Load Break Switch Site".
- Fuse = assets with a category of "Fuse - O/H".
- When the fuse's voltage > 11kV, it is included in the category of "Switches".
- Only assets with an owner of "Essential Energy".
- Service Status = "In Service".
- Year has been determined by the asset's "Constructed Date". If this is not available, then Year has been derived as follows:
    - If the "Constructed Date" is blank, then use the parent pole's "Date Installed" if available or applicable.
    - Those assets that do not have a "Constructed Date" or a parent pole with a "Date Installed" have been prorated across the existing asset age profile.
- Voltage has been determined from the asset's "Primary Voltage". If the asset voltage is blank or "Unknown", then the Voltage has been derived as follows:
    - If no asset Voltage is available, the parent pole's "Highest Voltage" is used if available or applicable.
    - If the parent pole's Highest Voltage is unknown, then the asset's Maintenance Area primary voltage is used instead (determined from Smallworld data).

2. Extract data/age profile for Zone Substation Circuit Breakers recorded in WASP

SQL Logic:

- ZS Circuit Breakers with a Service Status indicating it is in service or will be in future ("In Service", "Open Point", "System Spare", "Under Construction", "Out of Service", "Not Applicable", or "Under Repair").
- Only ZS Circuit Breakers with an Owner = "Essential Energy".
- All ZS Circuit Breakers have been categorised as "Circuit Breaker".
- Voltage has been obtained from the ZS Circuit Breaker's "Primary Voltage". If "Primary Voltage" is blank, then "<=11kV" has been assumed. This only occurred in < 0.05% of cases.
- Year has been obtained from the ZS Circuit Breaker's "Year of Manufacture". If this was not available, then Year has been derived as follows (this occurred in 7% of cases):
    - If ZS Circuit Breaker "Year of Manufacture" is blank, then use the ZS Circuit Breaker's "Commissioning/Install Date".
    - If the ZS Circuit Breaker's "Year of Manufacture" and "Commissioning/Install Date" is blank, then the parent Zone Substation's "Year of Manufacture" was used.
    - Those ZS Circuit Breakers that do not have a "Year of Manufacture" or "Commissioning/Install Date" and whose parent Zone Substation does not have a "Year of Manufacture" have been prorated across the existing asset age profile.

3. Extract data/age profile for Zone Substation Switches recorded in WASP

SQL Logic:

- ZS Switches with a Service Status indicating it is in service or will be in future ("In Service", "Open Point", "System Spare", "Under Construction", "Out of Service", "Not Applicable", or "Under Repair").
- Excludes Fault Throwers and Capacitor Discharge Switches.
- Only ZS Switches with an Owner = "Essential Energy".
- All ZS Switches have been categorised as "Switch".
- Voltage has been obtained from the ZS Switch's "Primary Voltage". If "Primary Voltage" is blank, then "<=11kV" has been assumed.
- Year has been obtained from the ZS Switch's "Year of Manufacture". If this was not available, then Year has been derived as follows:
    - If ZS Switch's "Year of Manufacture" is blank, then use the ZS Switch's "Commissioning/Install Date".
    - If the ZS Switch's "Year of Manufacture" and "Commissioning/Install Date" is blank then the parent Zone Substation's "Year of Manufacture" was used.
    - Those ZS Switches that do not have a "Year of Manufacture" or "Commissioning/Install Date" and whose parent Zone Substation does not have a "Year of Manufacture" have been prorated across the existing asset age profile.

4. Estimate the number of Fuses/Switches that are part of Substations and are not discretely recorded in WASP

Fuses/Switches that are part of substation sites (both pole mounted and ground/enclosed) are not typically discreetly recorded in WASP. These were estimated as follows:

Pole mounted Substation Sites:

- The quantity of pole mounted Substation Sites was determined from WASP. It was determined that there are approximately 129,964.
- The average quantity of fuses for overhead/pole mounted Substation Sites was determined. Based on the existing configuration of Substation Sites across Essential Energy's network it was determined that on average there are 2.5 fuses per Substation Site; 1.5 LV fuses and 1 HV fuse per Substation Site.
- The estimated quantity of fuses for overhead/pole mounted Substation Sites was determined by multiplying steps 1 and 2:
- LV Fuses = 1.5 x 129,964 = 194,946
- HV Fuses = 1 x 129,964 = 129,964
- The profile of Primary Voltage for existing pole mounted Substation Sites was determined from WASP as follows:

Voltage	Count	Percentage	Mapping
11kV	86,677	67%	<=11kV
12.7kV	3,399	3%	>11kV and <=22kV
19.1kV	5,061	4%	>11kV and <=22kV
22kV	33,447	26%	>11kV and <=22kV
33kV	1,351	1%	>22kV and <=33kV

Split	
<=11kV	67%
>11 and <=22kV	32%
>22 and <=33kV	1%
	100%

- These percentages were applied to the estimated counts in step 3 to determine the quantities per voltage group:
  - LV Fuses
    - LV = 100% x 194,946 = 194,946
  - HV Fuses
    - <=11kV = 67% x 129,964 = 87,076
    - >11kV and <=22kV = 32% x 129,964 = 41,589
    - >22kV and <=33kV = 1% x 129,964 = 1,300
- All of these were categorised as “Fuse”.

Ground Mounted/Enclosed Substation Sites:

- The quantity of ground mounted/enclosed Substation Sites was determined from WASP. It was determined that there are approximately 6,571.
- The average quantity of fuses/switchgear for ground mounted/enclosed Substation Sites was determined. Based on the existing configuration of these Substation Sites across Essential Energy’s network it was determined that on average there are 6 fuses/switches per Substation Site; 4 LV fuses and 2 HV fuses per Substation Site.
- The estimated quantity of fuses for ground mounted/enclosed Substation Sites was determined by multiplying steps 1 and 2:
  - LV Fuses = 4 x 6,571 = 26,284
  - HV Fuses = 2 x 6,571 = 13,142
- The profile of Primary Voltage and categorisation (fuse, circuit breaker or operational switch) for existing ground mounted/enclosed Substation Sites was determined from WASP as follows:

LV Switchgear

Split	
LV Circuit Breaker	11%
LV Fuse	89%
	100%

HV Switchgear

Split	
11kV Circuit Breaker	35%
22kV Circuit Breaker	5%
11kV Fuse	41%
22kV Fuse	3%
11kV Operational Switch	10%
22kV Operational Switch	6%
	100%

- These percentages were applied to the estimated counts in step 3 to determine the quantities per voltage group:
  - LV Switchgear
    - LV Circuit Breaker = 11% x 26,284 = 2,891
    - LV Fuse = 89% x 26,284 = 23,393
  - HV Switchgear
    - <=11kV Circuit Breaker = 35% x 13,142 = 4,600
    - <=11kV Fuse = 41% x 13,142 = 5,388
    - <= 11kV Operational Switch = 10% x 13,142 = 1,314
    - >11kV and <=22kV Circuit Breaker = 5% x 13,142 = 657
    - >11kV and <=22kV Fuse = 3% x 13,142 = 394
    - >11kV and <=22kV Operational Switch = 6% x 13,142 = 789
- The age profile of the equivalent category of the existing switchgear was then applied to each of these estimated counts to determine year/age.

Use of Estimated Information

Essential Energy has estimated information for:

- Distribution Switchgear currently recorded in WASP as follows:
  - The asset's age when there is no "Construction Date" for that asset. The estimation uses the parent pole's "Date Installed" if available which gives a fairly accurate estimation. If neither of these dates were available to determine age, then the assets were aged as per the existing age profile.
  - The asset's voltage when there is no voltage listed for that asset. The estimation uses the parent pole's voltage or the Maintenance area's primary voltage which gives a fairly accurate estimation.
- Zone Substation Circuit Breakers recorded in WASP as follows:

- the asset's age when there is no "Year of Manufacture" for that asset. The estimation uses the asset's "Commissioning/Install Date" for the ZS Circuit Breaker. If neither of these dates were available to determine age then the assets were aged as per the existing age profile.
- the asset's voltage when there is no voltage listed for that asset. The estimation assumes <=11kV in < 0.05% of cases.

- Distribution Switchgear that is considered part of Substation Sites and is not discretely recorded in WASP has been entirely estimated based on knowledge of the network and existing data in WASP.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under "Switchgear" in Table 5.2.1 over the period requested.

Reliability of Information

The reliability of this data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations that have been used.

Public Lighting

Compliance with the requirements of the notice

The information provided reports the number of public lighting luminaires and public lighting poles. Assets owned by Essential Energy and assets operated and maintained by Essential Energy but not owned by Essential Energy have been included.

Source of Information

This data has been obtained from Essential Energy's WASP database using SQL and grouping of data in Excel.

Methodology & Assumptions

SQL Logic:

- For the luminaire count - only Streetlights with an Owner = "Essential Energy" or "RTA" (which Essential Energy maintains) are included.
- For the dedicated streetlight pole count – only Streetlights that are owned by Essential Energy or Privately Owned but maintained by Essential Energy. No RTA poles.
- Only Streetlights with a Service Status = "In Service".
- Streetlights with a Lighting Category = "Quarantined" were excluded.
- Streetlights with a wattage >= 150 are assumed to be Major Road. All else are classified as Minor Road.
- Assets with a category of "Nightwatch Light" were excluded.
- Age is determined from the parent pole's "Date Installed" attribute.
  - If this does not exist then the streetlight's "Connection Date" attribute is used to determine the age.
  - Those assets that do not have a "Date Installed" or a "Connection Date" have been prorated across the existing asset age profile.

Use of Estimated Information

Essential Energy has used some estimated information for the streetlight's age when there is no install date for the parent pole. When there is no install date the streetlight's "Connection Date" is used which gives a fairly accurate estimation. Those assets that do not have a "Date Installed" or a "Connection Date" have been prorated across the existing asset age profile.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under "Public Lighting" in Table 5.2.1 over the period requested.

Reliability of Information

The reliability of this data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations that have been used.

SCADA and Network Control

Compliance with Requirements of the Notice

The information provided shows the number of Essential Energy owned zone substation SCADA RTUs that are currently in use.

Source of Information

This data has been obtained from:

- Essential Energy's WASP database using SQL.
- Firmware version dates, where WASP data has been of a lower confidence.
- Grouping of data in Excel.

Note: assets captured in this category are those which have a sole purpose of providing SCADA and Network Control functionality to zone substations. Assets used to provide communication services to pole top devices have not been included in this section and will be captured elsewhere.

Methodology & Assumptions

SQL logic:

- Includes assets categorised in WASP.
- Only Essential Energy assets included.
- Only In Service assets included.
- No age data is available for asset category so the Firmware version is then utilised to affirm the installed date of the RTU.

Use of Estimated Information

The age of the zone substation SCADA has been entirely estimated based on knowledge of the Firmware version dates and existing data in WASP.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under zone substation "SCADA and Network Control" in Table 5.2.1 over the period requested.

Reliability of Information

The reliability of this data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations that have been used.

Other - Zone Substation Property

Compliance with requirements of the notice

The information provided shows the number of Essential Energy owned Zone Substation Sites that are currently in use.

Source of information

This data has been obtained from Essential Energy's WASP database using SQL and grouping of data in Excel.

Methodology and Assumptions

SQL Logic:

- Includes assets categorised in WASP as "ZS 3 Site".
- Only Essential Energy assets included.
- Only In Service assets included.
- Age is obtained from site's commissioning year. If this is not available then the year was estimated from either site drawings or child asset age.
- Those assets where age cannot be estimated are distributed across the existing asset age profile.

Use of estimated information

Where the age of the of the Zone Substation Sites is not recorded in WASP, it has been estimated based on knowledge of the network and existing data in WASP.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under "Zone Substation Property" in Table 5.2.1 over the period requested.

Reliability of information

The reliability of this data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations used.

Other - Zone Substation Batteries

Compliance with requirements of the notice

The information provided shows the number of Zone Substation Batteries that are currently in use.

Source of information

This data has been obtained from Essential Energy's WASP database using SQL and grouping of data in Excel.

Methodology and Assumptions

SQL Logic:

- Includes assets categorised in WASP as "ZS Battery".
- All owners are included.
- Only In Service assets included.
- Age is obtained from site's "Year of Manufacture". If this is not available, then the Zone Substation Site's "Commissioning Year" is used.
- Those assets with unknown ages are distributed across the existing asset age profile.

Use of estimated information

Where the age of the of the Zone Substation Battery or the Zone Substation Site is not recorded in WASP, it has been estimated based on knowledge of the network and existing data in WASP.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under "Zone Substation Batteries" in Table 5.2.1 over the period requested.

Reliability of information

The reliability of this data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations used.

Other - Zone Substation Current Transformers

Compliance with requirements of the notice

The information provided shows the number of Zone Substation Current Transformers that are currently in use.

Source of information

This data has been obtained from Essential Energy's WASP database using SQL and grouping of data in Excel.

Methodology and Assumptions

SQL Logic:

- Includes assets categorised in WASP as "ZS Current Transformer".
- All owners are included.
- Only In Service assets included.
- Age is obtained from site's "Year of Manufacture". If this is not available, then the Zone Substation Site's "Commissioning Year" is used.
- Those assets with unknown ages are distributed across the existing asset age profile.
- Exclude those with Type = "LV Typroid".

Use of estimated information

Where the age of the of the Zone Substation Current Transformer or the Zone Substation Sites is not recorded in WASP, it has been estimated based on knowledge of the network and existing data in WASP.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under "Zone Substation Current Transformers" in Table 5.2.1 over the period requested.

Reliability of information

The reliability of this data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations used.

Other - Zone Substation Voltage Transformers

Compliance with requirements of the notice

The information provided shows the number of Zone Substation Voltage Transformers that are currently in use.

Source of information

This data has been obtained from Essential Energy's WASP database using SQL and grouping of data in Excel.

Methodology and Assumptions

SQL Logic:

- Includes assets categorised in WASP as “ZS Voltage Transformer”.
- All owners are included.
- Only In Service assets included.
- Age is obtained from site’s “Year of Manufacture”. If this is not available, then the Zone Substation Site’s “Commissioning Year” is used.
- Those assets with unknown ages are distributed across the existing asset age profile.

Use of estimated information

Where the age of the of the Zone Substation Voltage Transformer or the Zone Substation Sites is not recorded in WASP, it has been estimated based on knowledge of the network and existing data in WASP.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under “Zone Substation Voltage Transformers” in Table 5.2.1 over the period requested.

Reliability of information

The reliability of this data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations used.

Other - Zone Substation Surge Diverters

Compliance with requirements of the notice

The information provided shows the number of Zone Substation Surge Diverters that are currently in use.

Source of information

This data has been obtained from Essential Energy’s WASP database using SQL and grouping of data in Excel.

Methodology and Assumptions

SQL Logic:

- Includes assets categorised in WASP as “ZS Surge Diverter”.
- All owners are included.
- Only In Service assets included.
- Age is obtained from Surge Diverter’s “Commissioning/Install Date”. If this is not available, then the following estimation is used:
  - Use the date of 132kV, 66kV and 33kV arresters.
- Those assets with unknown ages are distributed across the existing asset age profile.

Use of estimated information

Where the age of the of the Zone Substation Surge Diverter is not recorded in WASP, it has been estimated based on knowledge of the network and existing data in WASP.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under "Zone Substation Surge Diverters" in Table 5.2.1 over the period requested.

Reliability of information

The reliability of this data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations used.

Other - Zone Substation Protection Relays

Compliance with requirements of the notice

The information provided shows the number of Essential Energy owned Zone Substation Protection Relays that are currently in use.

Source of information

This data has been obtained from Essential Energy's WASP database using SQL and grouping of data in Excel.

Methodology and Assumptions

SQL Logic:

- Includes assets categorised in WASP as "ZS 4 PC Circuit".
- Only Essential Energy assets included.
- Only In Service assets included.
- No age data is available for asset category so the age profile for >33kV Switchgear has been used to estimate age.

Use of estimated information

The age of the Zone Substation Protection Relays have been entirely estimated based on knowledge of the network and existing data in WASP.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under "Zone Substation Protection Relays" in Table 5.2.1 over the period requested.

Reliability of information

The reliability of this data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations used.

Other - Frequency Injection Refurbishment

Compliance with requirements of the notice

The information provided shows the number of Frequency Injection Refurbishments that are currently in use.

Source of information

This data has been obtained from Essential Energy's WASP database using SQL and grouping of data in Excel.

Methodology and Assumptions

SQL Logic:

- Includes assets categorised in WASP as “ZS FI Plant”.
- All owners are included.
- Only In Service assets included.
- Age is obtained from ZS FI Plant’s “Year of Manufacture”. If this is not available, then the “Commissioning/Install Date” is used.
- Those assets with unknown ages are distributed across the existing asset age profile.

Use of estimated information

Where the age of the of the Frequency Injection Refurbishment is not recorded in WASP, it has been estimated based on knowledge of the network and existing data in WASP.

Material Accounting Policy Changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported under “Frequency Injection Refurbishment” in Table 5.2.1 over the period requested.

Reliability of information

The reliability of this data is dependent on the accuracy of the data within the WASP database as well as the accuracy of the assumptions and estimations used.

Other - Type 5&6 Installed Meters

Compliance with Requirements of the Notice

The information provided shows the number of Essential Energy owned Type 5 & 6 Installed Meters.

Source of Information

Data has been sourced from Essential Energy’s EDDiS database using SQL and grouping of data in Excel.

Methodology & Assumptions

- The total number of installs for 2015-16 was calculated by query from all meter movements processed through Secure Web forms portal. Total meters installed were 54,889.
- Total number of meter removals was calculated by taking the difference in year-end total meter count from the EDDIS database between 2015-16 and 2014/15 and also taking the number of meters installed into account, ie.
    - Meters removed = Meters installed - (Total meters 2015-16 - Total meters 2014/15), which resulted in 54,325.
- The removed meters were than taken away from each year of asset life based on the proportion of total population.

Use of Estimated Information

This table contains estimated information.

Reliability of Information

The reliability of the data in this table is dependent on the accuracy of the data within the EDDiS database and the assumptions and estimations that have been used. Caution should be applied if using this data for benchmarking or decision making purposes.

Economic Life (years)

Mean

The data compiled in this column represents the economic life of the assets reported upon in this table. It is based on the data reported in the 2013-14 Category Analysis RIN, which in turn came from Essential Energy's Revenue Roll Forward Model as approved by the AER. Essential Energy believes that the data is reliable and will be updating it for the next regulatory period.

Standard Deviation

The data in this column represents the square root of the data in the "Mean" column. This method of deriving the standard deviation was noted as one possible method in section 5 "Replacement capex" (page 51) in the AER's Explanatory Statement to the Category Analysis RIN, issued March 2014.

Worksheet 5.3 - MD - Network level

Table 5.3.1 – Raw and Weather Corrected Coincident MD at Network Level (Summed at transmission connection point)

Compliance with Requirements of the Notice

This section shows the actual Coincident Maximum Demand.

In order to provide the actual loads for 2015-16, the winter of 2015 and the summer of 2015-16 were used, which included loads from April 1st 2015 to March 31st 2016. An example of the reasoning behind this method is where there is a very high load winter, with a large peak in June and another in July. A financial year split will count these events as two separate years, such that the data misses the previous and next summer peaks. Essential Energy does not consider the use of financial years to be adequate for use in forecasting.

Source of Information

The data is based on the maximum network demand as per the regulatory accounts and what was reported in the Economic Benchmarking RIN.

The network level maximum demand is sourced from demand meters (via IMDR).

Methodology & Assumptions

The maximum network demand is determined by the sum of Essential Energy's Bulk Supply Points, Cross Border Supplies, and the inclusion of the Embedded Generators load at a half hourly level. From the half hourly data the Maximum Demand is determined with the date and time recorded. The actual dates and times of the occurrence have been reported in this table.

Private zone substation loads were not included in the zone substation figures.

The methodology used is as per DOPSD0111 and DOPSD0112 - Annual system maximum demand characteristics at the transmission connection point – MW measure, Table 3.4.3.2 which are based on the ratio of non-coincident peak demand to non-coincident weather corrected peak demand (ie. DOPSD0107, DOPSD0108 and DOPSD0109).

Use of Estimated Information

Information is based on actual data readings from each supply point, and is as per the Methodology and Assumptions section above.

Reliability of Information

The maximum demand information is considered reliable.

Worksheet 5.4 - MD & utilisation-Spatial

Table 5.4.1 - Non-Coincident & Coincident Maximum Demand

Compliance with Requirements of the Notice

Substation Definition:

Any substation (or a part of a substation) that transforms voltages that supply subtransmission networks (33kV and above), have been included as a subtransmission substation (STS). Any substation that transforms voltages (from 33kV and above) that supply distribution networks (33kV and below) have been included as a zone substation (ZS).

Substation Rating:

The AER definition of *"*Normal cyclic rating (for substations)*"* is *"*The maximum peak daily loading based on a given load cycle that a substation can supply each day of its life under normal conditions resulting in a normal rate of wear*"*.

Essential Energy defines the rating of a substation to meet the above definition to be 110% in summer and 120% in winter of the combined nameplate rating of all transformers within the substation. For example, based on a summer peak load, if the substation only has one transformer the substation rating will be 110% of the nameplate rating of that transformer, or if it has two or more transformers that can be used simultaneously to supply the load, the substation rating will be 110% of the combined nameplate rating of all the transformers.

Source of Information

The individual STS data was obtained from demand meters (via IMDR). The individual zone substation data was obtained from demand meters (via IMDR) and from SCADA (via TrendSCADA).

Methodology & Assumptions

Change to Timing Arrangements:

In order to provide the actual loads for 2015-16, the winter of 2015 and the summer of 2015-16 was used, which included loads from April 1st 2015 to March 31st 2016. An example of the reasoning behind this method is where there is a very high load winter, with a large peak in June and another in July. A financial year split will count these events as two separate years, so the data misses the previous and next summer peaks. Essential Energy does not consider the use of financial years to be adequate for use in forecasting.

Raw Adjusted MD:

- **Non – Coincident Maximum Demand**
  The vast majority of STSs and ZSs have reliable data recording devices. A minor number of the very small ZSs have limited methods to record the peak demand such as recloser data or maximum demand indicators from which maximum demand has been derived. The raw data from each substation is collated into a common format and is compared against network configuration changes and filtered where an absence or abnormality is present. The peak demand is then screened and further cleansed if required to eliminate abnormal peaks to determine the true peak demand.
- **Coincident Maximum Demand**
  The raw coincident maximum demand for the 2015-16 year was extracted from each site after it had been compiled into the common format required for screening the non-coincident maximum demand.
- **Adjustments – Embedded Generation:**
  Only discrete embedded generation units that impact the demand of the STSs or ZSs are included in the table. Rooftop photovoltaic generation is not shown as their impact is included in the actual and forecast demand of the individual ZSs. There are other discrete generation units that connect via Essential Energy's subtransmission network to a TNSP's connection point but they have no impact on the demand of Essential Energy-owned STSs or ZSs.

- **Non Coincident Weather Corrected MD:**
  The weather corrected data for 50% POE or 10% POE has been calculated for the vast majority of STSs and ZSs based on the nationally consistent methodology of using regression with historical local temperature data. A very small number of sites did not have sufficient history of demand data to accurately produce POE values. The raw adjusted MD was used where POE data could not be produced.
- **Coincident Weather Corrected MD:**
  Coincident weather correction is based on the ratio of non-coincident peak demand to non-coincident weather corrected peak demand.
- **Date MD Occurred:**
  The date and time of the coincident and non-coincident peak demands were identified during data extraction, where the peak MW and corresponding MVA demand was recorded in Table 5.4.1. A number of sites have been identified where the raw adjusted MVA maximum demand occurred at a different time to the raw adjusted MW maximum demand.

Subtransmission and Zone Substations with MVA Peak different to MW Peak		
Substation	**Non-Coincident MVA Peak**	**Date and Time of MVA Peak**
Casino 132/66kV	25.649	01/2/2016 16:00
Dubbo 132/66kV	59.644	14/01/2016 13:30
Goulburn 132/66kV	32.436	25/02/2016 16:30
Lismore 132/66kV	89.486	15/07/2015 19:00
Snowy Adit 66kV	9.463	25/08/2015 19:00
Terranora 110/66kV	76.775	16/03/2016 9:30
Bellata	1.195	20/11/2015 17:30
Bendick Murrell	1.824	13/01/2016 17:30
Bohnock	5.848	17/07/2015 18:00
Bourke 33 kV	3.038	21/07/2015 7:30
Bungendore	7.881	02/06/2015 7:00
Buronga Town	15.008	07/03/2016 16:30
Burraga	0.593	07/09/2015 14:30
Cobar Peak	16.473	05/09/2015 22:00
Coolamon	4.25	06/03/2016 19:00
Corowa	17.827	24/02/2016 17:30

Eden South	4.859	10/07/2015 10:00
Forest Hill	6.933	08/03/2016 14:00
Girilambone	1.827	27/08/2015 16:30
Glen Innes	8.461	17/07/2015 11:00
Grafton South	18.698	26/11/2015 16:30
Harrington	3.182	11/12/2015 18:00
Hillgrove	1.625	12/05/2015 16:00
Jerilderie	7.355	08/03/2016 19:00
Keepit Dam	0.187	01/01/2016 19:30
Leeton	19.097	13/01/2016 15:00
Manildra	11.044	03/03/2016 14:30
Morrow St	14.123	24/02/2016 13:00
Moruya Town	6.925	07/06/2015 18:30
Nangus	1.205	19/01/2016 19:30
Nundle	1.678	25/02/2016 20:00
Oberon 132kV	26.119	16/04/2015 8:30
Orange North	15.353	05/08/2015 12:00
Owen St	16.212	13/07/2015 18:00
Smithtown	4.12	12/10/2015 11:00
Snowy Adit 11kV	0.081	20/11/2015 11:00
Trundle	2.225	25/02/2016 19:00
Tweed Heads South	21.708	25/05/2015 18:00
Upper Manilla	0.786	21/02/2016 15:00
West Wyalong	8.009	25/02/2016 17:30
Whitton	4.647	19/12/2015 19:30

Wilcannia	1.432	02/03/2016 19:30
Woodlawn	6.257	16/12/2015 16:30
Young	16.342	25/02/2016 17:00

- **Winter/Summer Peaking:**
  Essential Energy defines the seasons as between 1st April and 30th September for winter, and 1st October to 31st March in the following year for the summer period.

Use of Estimated Information

Refer to the above Methodology and Assumptions section for the use of estimated information.

Reliability of Information

Most data for the 2015-16 year has been gathered from raw metering data, so is considered reliable.

Worksheet 6.3 - Sustained interruptions

Table 6.3.1 – Sustained interruptions to supply

Compliance with Requirements of the Notice

Data has been reported in accordance with the definitions provided in the Category Analysis RIN and the AER's Service Target Performance Incentive Scheme (STPIS) unless otherwise specified in the Methodology & Assumptions section below.

Source of Information

Data was sourced from PowerOn Fusion and an Access database. PowerOn makes up the central modules of Essential Energy's power Distribution Management and Outage Management Systems (DMS/OMS). The spreadsheet used to collate data is named "15-16 RIN Templates AP&R".

The mapping of the Essential Energy cause list to the AER RIN cause list is contained in the APR database table "ENA Cause List". Additional updates for Detailed Reasons are through queries "RESET RIN Interruptions List 1-7".

Methodology & Assumptions

The data has been collected and collated in line with the Category Analysis RIN Instructions and Definitions guidance issued by the AER. Customer numbers include active NMIs with an active or inactive account. This is the way data has been collected and stored since PowerOn Fusion went live in November 2012.

A sustained interruption has been assumed to be any interruption of one minute or greater duration, ie. it does not include momentary interruptions. This is as per the definition of an interruption in the STPIS.

Unmetered accounts are not included in any of the customer numbers and are not included in any SAIDI, SAIFI or MAIFI data.

The process to run Monthly SCS Reports for the year is as follows:

- RESET RIN Interruptions List 1-7 (updates columns – Reason for Interruption and Detailed Reason for Interruption
- RESET RIN Interruptions List 8 – final output

Please note, that in column G of the table, detailed descriptions of reasons for interruptions with a reason of "Other" are not able to be entered as the template does not allow it.

Use of Estimated Information

Not applicable, as only actual information has been used.

Reliability of Information

Information has been sourced from current systems and management is comfortable that the information is reliable.