BASIS OF PREPARATION
RESPONSE TO CATEGORY ANALYSIS RIN

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. Essential Energy continues to stress concern in relation to the detailed templates submitted.

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 2013/14 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	Likelihood to Pass an Audit	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	Likely	Comfortable
Yellow	Available, but with some gaps	**Moderate** – estimate based on statistically significant sample size	Possible, but unlikely	Comfortable
Orange	Little or no data available	**Complex** – estimate based on formula, standard parameters or other source	Not likely	Not comfortable
Red	Little or no data available	**Impossible** – rough estimate or not possible, e.g. rule of thumb from experience	Not likely	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 CAPEX and OPEX forecasts.

2.7 Essential Energy's Preparation Costs

The costs incurred by Essential Energy in terms of staffing resources for completing the RIN has once again been considerable, especially completing three RINs at the one time. Further considerable costs will be incurred in building or modifying systems to capture the information going forward which is not otherwise required for Essential Energy's operational activities.

The burden placed on key staff has been considerable, and at times almost overwhelming. This is exacerbated by also being involved in preparing our regulatory proposal, and responding to questions and information requests on the RIN provided as part of our proposal.

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 Augex	Table 2.3.3.2	**Cost Metrics**
2.3 Augex	Table 2.3.4	**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	**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 draft 2013/14 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 2013/14 data has been extracted and reconciled to relevant management and draft statutory accounts to ensure its validity. The underlying cost structures in this data set have been mapped to the 2013/14 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 2013/14 financial information in the Category Analysis RIN is a reasonably accurate representation of the 2013/14 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 & Reconciliation

Table 2.1.1 – Standard Control Services CAPEX

Compliance with Requirements of the Notice

This section summarises 2013/14 data for Standard Control Services CAPEX, broken up into various categories. It also contains a Balancing Item and 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 2013/14 Annual RIN has also been used to provide the total CAPEX figure which was required for the calculation of the Balancing Item, as well as the Capital Contributions amount.

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.

The Balancing Item was calculated by obtaining the total CAPEX figure from the 2013/14 Annual RIN and deducting from it the CAPEX in the table.

Capital Contributions were obtained from the 2013/14 Annual RIN.

Essential Energy has provided a reconciliation of the balancing items in tables **2.1.1**, **2.1.2**, **2.1.3**, and **2.1.4** in the file *2.1 Expenditure Summary Tables Reconciliation_2014_10_07.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 Reset RIN template may be based on assumptions and estimates and should be used with caution when using 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 2013/14 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 2013/14 Annual 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 in the category Anlaysis 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 2013/14 Annual RIN and deducting from it the OPEX in the table.

Essential Energy has provided a reconciliation of the balancing items in tables 2.1.1, 2.1.2, 2.1.3, and 2.1.4 in the file *2.1 Expenditure Summary Tables Reconciliation_2014_10_07.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 2013/14 CAPEX for Alternative Control Services, broken up into various categories. It also contains a Balancing Item.

Source of Information

This table is chiefly 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 2013/14 Annual RIN was used to provide the total CAPEX 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 in 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 CAPEX figure from the 2013/14 Annual RIN and deducting from it the CAPEX in the table.

Essential Energy has provided a reconciliation of the balancing items in tables **2.1.1**, **2.1.2**, **2.1.3**, and **2.1.4** in the file *2.1 Expenditure Summary Tables Reconciliation_2014_10_07.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 2.1.4 – Alternative Control Services OPEX

Compliance with Requirements of the Notice

This section contains summary data of the 2013/14 OPEX for Alternative 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 2013/14 Annual RIN was 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 in 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 2013/14 Annual RIN and deducting from it the OPEX in the table.

Essential Energy has provided a reconciliation of the balancing items in tables 2.1.1, 2.1.2, 2.1.3, and 2.1.4 in the file *2.1 Expenditure Summary Tables Reconciliation_2014_10_07.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 Reset 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.

Asset Group	System / Document
All	Peoplesoft Financial System for expenditure
Numerous	WASP
Numerous	Smallworld
Numerous	TotalSAFE
Numerous	Electricity Network Incident Failure Database (ENI)
Numerous	Electricity Networks Association Annual Pole Failure Reporting
Public lighting	Pole replacement and failures. These figures represent only dedicated streetlight columns.
SCADA, Network Control & Protection Systems	Primavera – for capital project data
SCADA, Network Control & Protection Systems	Service Manager – for asset replacements/asset failure
SCADA, Network Control & Protection Systems	Diagnostic Software – for radio asset data
SCADA, Network Control & Protection Systems	ROE device list - for IP asset data

Methodology & Assumptions

All Asset Groups

Only work tasks that have been completed as capital expenditure have been included in any replacement numbers. Failure numbers are based entirely from those replacements that were located and replaced on the same day as operating expenditure.

Expenditure has been completed in accordance with the methodology outlined in section *3 Financial Data*. Any specific methodology and assumptions in relation to expenditure are outlined below.

Poles

Pole Reinforcing (Staking)

- Data has been sourced from WASP.
- Reinforcements have been based on a count of all completed capitalised WASP work tasks (Pole - Reinstate).
- As Table 2.2.1 only refers to those tasks completed as capital work and the majority of pole reinforcing work that has been completed to date has been classified as operating expenditure, the table incorrectly assumes there has been little pole reinforcing in 2014.
- Failures have been based on all known failures. WASP does not have a work task associated with failure of pole reinforcements due to the rare occurrence of these failures.

Pole Replacements

- Data has been sourced from WASP.
- Data has been filtered to include only those poles that are NOT a dedicated street light asset. Unknown material types assumed to be timber.
- 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).

Failures

- 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, along with any poles determined to not have failed (regardless of whether they have a WASP task or ENI indicating they did fail).

Pole Top Structures

- Data has been sourced from WASP.
- Replacement data has been based on a count of all completed capitalised 'Crossarm - Replace' tasks with a refurbishment driver.
- Failure data has been based on a count of all completed OPEX WASP work tasks (Crossarm - Replace) that were reported and completed on the same day.

Overhead Conductors & Underground Cables

Conductor/Cable Replacement

- Replacement data has been sourced from reconductor construction plans entered into Smallworld.
- Data has been filtered to remove all work done under any AER driver except for replacement. Unknown phase voltages have been assumed to be three phase.

Conductor/Cable Failure

- Failure data has been sourced from WASP.
- Overhead conductor failure data is based on WASP work tasks (Conductor - Replace Sleeves, Conductor - Replace Splice, Conductor - Install Sleeves, Conductor - Install Splice).
- Underground cable failure data is based on the following WASP work tasks; (URD – Cable – Replace). Unknown conductor/cable phasing spread by ratio of known phasing.
- AER Driver has been ignored for failures.

Service Lines

- Data sourced from WASP.
- Replacement data has been based on a count of all completed capitalised WASP work tasks (Service – Replace Service) and (Service - Programmed Replacement) with an AER driver of refurbishment.
- Failure data has been based on a count of all completed OPEX WASP work tasks (Service – Replace Service) that were reported and completed on the same day.

Transformers

- Data has been sourced from WASP, as well as the Transformer Failure Database Master for Zone Substations.
- As regulators do not have their own category, regulators have been included in 'Other'.
- Replacement data for distribution transformers has been based on a count of completed capitalised WASP work tasks (Substation - Replace Tank and Regulator – Replace Tank).
- 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.
- Unknown distribution substation types have been assumed to be pole substations (same result as distributing by ratio). Unknown distribution transformer kVA assumed to be ≤ 60. Unknown phasing assumed to be single phase, along with SWER.
- 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 (i.e. non replacements).
- Failure data for zone substation transformers is based on data contained within the Transformer Failure Database Master.

Switchgear

- Data has been sourced from WASP.
- 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).
- Failure data for distribution switchgear has been based on a count of the above WASP work tasks that were reported and completed on the same day and recorded as operating expenditure with an AER driver of refurbishment.
- Replacement data for zone substation switchgear was based on switchgear installed in the financial year, and filtered to remove new installations (i.e. non replacements). Failure data for zone substation switchgear was taken from WASP replacement tasks where the cause was 'Catastrophic Failure'.

Public Lighting

These figures represent only dedicated streetlight columns.

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 are not considered as REPEX.
Poles	Sum of all replacement work task quantities identified by the method described for *Table 4.1.2 – Public Lighting Descriptor Metrics Annually.*

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 are not considered as REPEX.
Poles	Sum of all replacement work task quantities identified by the method described in for *Table 4.1.2 – Public Lighting Descriptor Metrics Annually.*

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.
- Projects to deliver other network infrastructure 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.
- **Asset Failure** data was obtained from Service Manager and relates to assets that have been replaced due to unplanned failure. 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 regulatory accounts figures for 2013/14.

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

Apportionment of expenditure into the different categories requested by the AER is based on assumptions and estimates so caution should be applied 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)
- Electricity Network Incident Failure Database (ENI)

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 (i.e. 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.

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

- Data has been sourced from Smallworld GIS.
- 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 conductor (LV ABC, HV ABC, CCT etc) has been included as LV ABC.

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 been required 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 (e.g. 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 – 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 Primavera, Essential Energy's project management 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, then 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 Primavera 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.

Use of Estimated Information

There is no estimated data for this table.

Reliability of Information

The data in this table for 2013/14 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 Primavera, Essential Energy's project management 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.

Use of Estimated Information

There is no estimated data for this table.

Reliability of Information

The data in this table for 2013/14 is considered reliable. .

Table 2.3.3.1 – 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. 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 work pack constructions in WASP.

Methodology & Assumptions

Distribution Substations Added/Refurbished/Upgraded:

The data for the current period was sourced by categorising the transformers description in the report to Pole, Ground or Indoor substations (Description example Transformer 25kVA 22kV 1Ph [GWD]).

Use of Estimated Information

As described above, 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.

Table 2.3.3.2 - Augex data – HV/LV Feeders and Distribution Substations – 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 of Direct Costs'* tab in the CAPEX master split workpaper. A PeopleSoft report is run each month 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 'Mapping Augex' tab in the CAPEX master split workpaper. Mapping has been used to link data from the *'Summary of Direct Costs'* tab to the RIN tables based on subject matter expert's judgements.

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 of Direct Costs'* tab in the CAPEX master split workpaper.

The total of all line items reconciles back to the *'Summary of Direct Costs'* tab which reconciles back to the Annual Financial RIN for 2013/14.

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 & Overhead connections and distribution transformers for Rural, Commercial/Industrial & Subdivision premises for 2013/14. 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	• Premises with a current customer that are within the Essential Energy network. Data extracted as at the end of each financial year within the reporting period. This excludes Residential/Commercial flag which wasn't available in historical data. • Premise with Residential/Commercial flag at time of report preparation. • 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.
NIEIR Report	Report previously submitted for Customer growth figures.
Planning database	• List of customer initiated projects. • Estimated unit costs for transformers based on OH/UG and kVA. Costing included estimated man hours.
Reporting Database	All embedded generation projects completed by Essential Energy in the reporting period.

Methodology & Assumptions

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.
- Residential/Commercial status of a premise has not changed during the reporting period.
- 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 the GIS, otherwise WASP was used.

Number of Connections

The number of connections as at the end of the year was extracted from Smallworld.

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

Residential/Commercial flag was derived from Energy. Embedded generations where the Residential/Commercial status could not be determined were deemed *'Unknown'*. The Unknowns were distributed across all categories based on the ratio of the known embedded generations.

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 Unknowns. 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, Smallworld provided the amount of network added or re-conductored 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 reported 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

The Energy embedded generation data was used as the basis for this data. Where installation date was blank, 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 Smallworld.
- All premises where the Overhead/Underground or Commercial/Residential status could not be determined were deemed *'Unknowns'*. The Unknowns were distributed across all categories based on the ratio of the known premises. For example, if there were 100 Residential/Underground premises, 50 Commercial/Underground premises and 30 Unknown Underground Premises, the ratio of Residential to Commercial is 2 to 1, therefore 20 unknown premises were added to Residential and 10 premises were added to Commercial.
- 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 repositories where the data is considered reasonably reliable. There were a number of projects that didn't exist in 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 Residential/Commercial flag and start date. • All embedded generation sites with Application Date and Installation Date.
Smallworld	• Premise/Service Point Spatial Data • Cable/Service Spatial Data • To determine the split between simple and complex connections.
Reporting database	• All embedded generation projects completed by Essential Energy in the reporting period.

Methodology & Assumptions

Main assumptions are:

- Residential/Commercial status of a premise has not changed during the reporting period.
- All commercial services are simple 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.

Residential/Commercial & Subdivision Connections

In Smallworld, a service point has a spatial location and is connected to the network by a piece of service cable. A service point can have one or many premises attached to it.

Each premise was attributed with the Connection Complexity of the Service Cable that was either connected to or near the Service Point. If no service cable was attributed, the premise was assumed to be simple.

The Connection Complexity of the Service Cable in the GIS were determined as either simple or complex as per the definitions in Appendix F of the RIN instructions document for both Residential, Commercial and Industrial types.

The year the service was installed was assigned by the premise's start date from Energy.

Embedded Generation

The Energy embedded generation data was used as the basis for this data. Where installation date was blank, 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 get total 2013/14 recoveries. These figures were adjusted to get 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 2013/14 was sourced from the 2013/14 regulatory account workings. The project for Non System Regulated Distribution CAPEX (PNSRDC) report was utilised to allocate the regulatory account 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:

Reconciling item for Table **2.6.1** – Other Fleet Assets

Trailers	**OPEX**	**7,119**
	CAPEX	**797**
Other	**OPEX**	**4,750**
	CAPEX	**1,630**

Buildings and Property – OPEX & CAPEX

2013/14 OPEX and CAPEX data was sourced from the 2013/14 Regulatory Account worksheets.

Furniture & Fittings – CAPEX

Data was sourced from the 2013/14 Regulatory Account worksheets.

ICT – OPEX & CAPEX

2013/14 OPEX data was sourced from PeopleSoft. In the Regulatory Accounts, ICT OPEX is broken down into two elements. The first being the recharge element (which matches with the RIN category client device expenditure) and the second being the balance of ICT charges. This first element, recharges, is incorporated in all the overheads of the business by virtue of the recharge system. The second element, balance of ICT charges, is also allocated to overheads and can be located in Regulatory Accounts Table 9.1 each year. The recharge element is calculated by taking the PeopleSoft recharge proportions and multiplying it by the network regulated business percentages. This figure is then used to input Table 2.6.1 for client device expenditure. The balance of ICT charges is proportioned into recurrent and non-recurrent based on mapping provided by the ICT department. CAPEX data was sourced from the 2013/14 Regulatory Accounts and mapped to the Category Analysis RIN based on ICT mapping data.

Use of Estimated Information

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

Reliability of Information

Given the underlying assumptions and method 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 deriving user numbers as at 30 June 2014, based on individual users who had one or more assets assigned. • Extract used for determining number of devices as at 30 June 2014
Regulatory account workings for 2013/14	Determining employee numbers

Methodology & Assumptions

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

Employee Numbers

Regulated Network FTEs were derived by taking the year end number of departmental FTEs and multiplying them by the Regulated Network percentage for that department derived using the CAM. The total number of network FTEs was then calculated by adding all of the Regulated Networks FTEs by department together. This proportion of Network FTEs as a percentage of total year end FTEs was then used to apportion ICT user numbers and device numbers in the sections below.

User Numbers

Total user numbers have been taken from an overnight extract of employee numbers from PeopleSoft as at 30 June 2014. The total user number was then multiplied by the proportion of network FTEs derived under the Employee Numbers section above.

Number of Devices

The device numbers include laptops and desktops only and are based on the ICT Configuration Management Database (CMDB). The 30 June 2014 total has been multiplied by the proportion of network FTEs derived under the Employee Numbers section above.

Assumptions

The main assumption is that the Network FTE percentage calculated using the CAM is representative of the Network percentage of devices and user numbers.

Use of Estimated Information

As mentioned above, assumptions underlie the derivation of the data. As such the data is all considered to be a best estimate.

Reliability of Information

Given the underlying assumptions and method 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
- LeasePlan
- 2013/14 regulatory account workpapers

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 in below.

Reconciling item for Table **2.6.3**

Trailers	Number purchased	**30**
	Number in fleet	**1,317**
	Proportion of total fleet expenditure allocated as regulatory expenditure (%)	**97.6%**
Other	Number purchased	**21**
	Number in fleet	**697**
	Proportion of total fleet expenditure allocated as regulatory expenditure (%)	**97.6%**

Average Kilometres Travelled by Vehicle Type

SGFleet 2013/14 annual report was used to extract the average kilometres per vehicle type.

Number Purchase by Vehicle Type

The number of purchases by vehicle type was listed in the SGFleet 2013/14 annual report.

Number Leased by Vehicle Type

The number of leases by vehicle type was extracted from the LeasePlan 2013/14 report.

Number in Fleet by Vehicle Type

The number in fleet by vehicle type was calculated by adding year end vehicle numbers by type from the SGFleet and LeasePlan reports.

Proportion of Fleet Expenditure Allocated as Regulatory Expenditure

This proportion has been taken from the 2013/14 regulatory account workpapers 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 Account 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

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

Source of Information

- WASP
- Essential Energy Vegetation Cost Model
- Field survey 2011/12
- Smallworld
- Sample of completed scoped vegetation maintenance areas in each Zone from the 2013/14 maintenance program

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. Route lengths are categorised using the following methodologies:

- If a span is 'LV-only' then it is LV.
- If a span is 'subtransmission only' then it is 'subtrans';
- If a span is HV short rural & LV then it is 'short rural (Rural)'
- If a span is HV long rural & LV then it is 'short rural (Rural)'
- If a span is HV but doesn't have a category, assume it is 'rural' and include it with the total 'short rural & long rural'
- LV Services – addition for 2014 RIN to ensure all spans maintained by Essential Energy are included.

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

Essential Energy has two 'Zone (DNSP to nominate)' sub tables for each Zone. One is for the Urban & Rural component using the above criteria and a second that consolidates the HV, LV, Subtrans and Services categories to ensure all overhead network has been included.

Number of Maintenance Spans

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

The percentage vegetated is based on a sample of completed scoped vegetation maintenance areas in each Zone from the 2013/14 maintenance program and split into rural and urban maintenance areas. The percentage is calculated by total defects reported in these maintenance areas divided by total poles in the maintenance area.

Total Length of Maintenance Spans

This has been calculated by multiplying 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.

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 2013/14. A maintenance area was considered to be a corridor if the work mix carried out in that area contained trimming and ground clearance work.

From this data it was deemed that 61% of the rural network was corridor and so this percentage was applied to the rural 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. This survey comprised 30 vegetation maintenance areas across the Essential Energy urban network with the sample made up of vegetation maintenance areas from each of the five vegetation maintenance Zones.

Average frequency of the cutting cycle

For the 2013/14 financial year the average cutting cycle is based on the total number of urban and rural vegetation maintenance areas that were completed divided by the total number of urban and rural areas.

Use of Estimated Information

The table contains estimated information as described in the methodology section above.

Reliability of Information

Given the underlying assumptions and method 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, i.e. from RIN categories to geographical zones.
- Service subcategories have been extracted out of PeopleSoft for 2013/14.
- Project types provided for the zone split were on a direct cost basis.
- Vegetation Operations management, department 891, was 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 draft 2013/14 Regulatory Accounts.

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 used when using this 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 an Microsoft Excel Master register of all fire incidents. This register is used to complete analysis and reporting (monthly and yearly).

A sample of the 2013/14 data from 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)	
Numerous	Electricity Networks Association Annual Pole Failure Reporting	
Public lighting maintenance	Asset Strategy Development	Average pole replacement cost
SCADA & Network Control Maintenance	Primavera	Capital project data
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 used as 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 aren't 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 is based on a count of customers.
- 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 'in service' poles, both distributor owned and distributor maintained private poles.
- 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. Data for this algorithm is approximate and should not be considered accurate.

Overhead Asset Inspection

- Assets at year end are taken from the Smallworld GIS system and represent the total route length of the overhead network excluding LV services (but including street-lighting). All service statuses have been included.
- As all overhead assets are inspected during the four year asset inspection cycle, yearly assets inspected are described as kilometres of route length covered by the asset inspector each year. This will include visual inspection of conductor, cross-arm, insulators, transformers, and other overhead equipment.
- Average age is based on assumed conductor age. Data for this algorithm is approximate and should not be considered accurate.

Network Underground Cable Maintenance: by Voltage

- Assets at year end are taken from 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 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. 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. 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 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 represents the number of minor/major preventative work tasks completed during 2013/14.
- 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.
- 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.
- 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.
- Inspection Cycle has been based on the cycle for power transformers, as this typically determines the substation inspection cycle.
- The maintenance cycle is shown as four years to correspond with typical maintenance cycles for Zone Substation properties.

Public Lighting Maintenance

- WASP data related only to dedicated streetlight supports.
- 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 consolidated from individual Local Government Area (LGA) end of financial year asset inventory reports. 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. As such not all metered lights have been captured in the WASP database.
- The reports are generated through COGNOS Report Studio using a materialised view created for the Streetlight Business Unit.
- Assets Inspected/Maintained **-** This number is the sum of all routine and non-routine streetlight maintenance tasks in 2013/14. 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:
    - All current in-service device details were extracted from the WASP database using COGNOS Report Studio. Data extracted included luminaire type, asset ID and date connected. Included in the extract was an expression to identify the number of days between the date connected and the date of extract. For devices where there was no date connected, an assumption was made and the first recorded history record for the asset has been used.
    - Data was then manually categorised as minor road and major road, and a formula was applied to identify the age in years by dividing the total age in days by 365. This calculation was performed for each individual asset.
    - The data was pivoted to identify major road and minor road lights. The total number of years was divided by the total number of devices for both major road and minor road lights to arrive at two separate average ages.

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.

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 one year, 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 thermo-vision 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 Thermo-vision Inspection: A detailed thermo-vision 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.
- Annual Regulator and Recloser Inspection: This program has historically ensured a detailed 6-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.
- 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 27 years.
- 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.
- 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. The specific methodology and assumptions made for this table are also outlined below.

Methodology & Assumptions

Pole Top, Overhead Line & Service Line Maintenance

- Financial data includes only the following project types:
  - 11300 Overhead Mains M&R Rural
  - 11305 Overhead Mains M&R Urban
  - 11310 Overhead Mains M&R Subt
  - 11340 Pole Nailing Rural
  - 11345 Pole Nailing Urban
- Due to specific expenditure data relating to services not being able to be separated, it is included in the one line item.

Pole Inspection & Treatment

- Financial data for this category includes only the following project types:
  - 11400 Pole Inspection Treat & Audit Rural
  - 11405 Pole Inspection Treat & Audit Urban
  - 11410 Pole Inspection Treat & Audit ST
- As the inspection of pole and other overhead assets is completed in the same program, the relevant expenditure is captured together. An assumption has been made to split this amount by the following ratio: 70% pole inspection and 30% overhead asset inspection.

Overhead Asset Inspection

- Refer to methodology for *Pole Inspection & Treatment* above.

Network Underground Cable Maintenance: by Voltage

- Financial data for this category includes only the following project types:
  - 11315 Underground Mains Rural M&R
  - 11320 Underground Mains Urban M&R
- As the available financial data is not separated by voltage or location the total expenditure has been combined in one line.

Network Underground Cable Maintenance: by Location

- Refer to the methodology for *Network Underground Cable Maintenance: by Voltage* above.

Protection Systems Maintenance

- Financial data for distribution reclosers includes only the following project type:
  - Reclosers/Regulators M&R
- Unfortunately this account includes maintenance expenditure on regulators as well as reclosers and cannot be accurately separated. It is assumed that approximately 10% of the total would relate to regulator maintenance.

Public Lighting

- Financial data for Public Lighting includes only the following project types:
  - 11311 Public Lighting M&R
  - 11460 Public Lighting Patrols
  - 11601 Streetlight Bulk Upgrade
- Night patrol work tasks have been included in non-routine maintenance expenditure for 2013/14, but will be split out to routine maintenance for future reporting periods.

SCADA

- Financial data for SCADA includes only the following project type:
    - 12310 SCADA M&R

Zone Substations

- Financial data for Zone Substations includes only the following project types:
    - 12100 Zone ST Protection Routine M&R
    - 12105 Zone ST Protect Defect M&R
    - 12110 Zone ST Protect Breakdown/Emergency M&R
    - 12115 Zone Sub Transformer M&R
    - 12120 Zone ST Distribution Protection M&R
    - 12125 Zone Substation Oil Treatment
    - 12200 Zone Substation Routine M&R
    - 12210 Zone Substation Defects M&R
    - 12215 Zone Substation Breakdown M&R
- The mapping between the Zone Substation asset categories was provided by SMEs, with the total Zone Substation expenditure aligning to the Regulatory Accounts.

Other Inspection Programs

- Expenditure for each of the following programs has been captured in the PeopleSoft financial system and based on the associated account lines.
    - Pit and Pillar Inspection
        - 11411 UG Pillar Inspections
    - Critical Equipment Inspection
        - 11415 Critical Asset Inspection
    - Enclosed Substation Inspection
        - 11445 Underground Asset Inspection
        - 11450 Distribution ST Inspection
    - Annual Thermo-vision Inspection Urban
        - 11425 Annual Thermo Inspection Urban
    - Annual Regulator and Recloser Inspection
        - 11430 Reg / Recloser Inspection
    - Earth Integrity Testing
        - 11447 OH Asset Earth Testing Urban
        - 11448 OH Asset Earth Testing Rural
    - Radial Subtransmission Live Line Inspection
        - 11455 Radial Subtrans LL Inspection

Use of Estimated Information

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

Reliability of Information

Maintenance expenditure at a total level aligns to the Regulatory Accounts, however the split into the various categories is based on assumptions. 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:

- 2013/14 draft 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 Regulatory Accounts.
- Cross checked coding with Regulatory Accounts to ensure 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.

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 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 Pool's' respectively.
- Alternative Control overheads relate only to Public Lighting in 2013/14.

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 applied when using the data 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:

- PeopleSoft HR module for 2013/14
- COGNOS cubes from the Finance system
- The Dashboard for April 2014 from Human Resources
- Essential Energy pay register April 2014
- The average of the 2012/13 and 2013/14 year end regulated network employees calculated in Table 2.6.2 has been used to determine the regulated average staffing level (ASL) to which the 2013/14 ASL number will reconcile.

Methodology & Assumptions

Main Assumptions

- It has been assumed that the staff split from the payroll report at end April 2014 is representative of the year end 2013/14 staff split.
- The 2013/14 ASL number is assumed to be the average of the 2012/13 and 2013/14 year end regulated network staff numbers listed in Table **2.6.2**.
- It is assumed that Corporate and Network support labour is all productive time, i.e. they do not form part of the overtime hours or costs. It is also assumed that Executive Managers and Senior Managers do not receive overtime and they have, therefore, been excluded from the overtime calculations.
- Ordinary and overtime hours have been apportioned between the appropriate categories within each labour group based on the proportionate share of ASLs. This has the effect of giving each labour group within each labour category the same productive hourly ordinary and overtime labour hours.
- The Employee and Labour Hire ASLs have been used to apportion labour costs between the Employees and Labour Hire, i.e. it is assumed that employees and Labour hire have the same costs.

As part of the calculations in this table, several additional assumptions have been made and are described in the methodologies below.

Deriving the Ratios for Splitting Costs and Hours Between the Different Labour Categories in the RIN

1. The HR dashboard lists employee ID and job family. The Pay register lists employee ID and payroll cost. Using the employee IDs, the data from these two files was combined to provide a split of employee job family and their associated costs.
2. This data was pivoted to produce an April 2014 split of staff numbers and payroll costs. The split of payroll costs by job family as a percentage of total payroll costs was then established, e.g. admin staff comprised 14% of the total payroll figure for April.
3. The job family data was then required to be aligned to the RIN classifications. Some classifications were straight one-for-one and others required splitting. The table below indicates how the job family data was aligned to the major RIN classifications:

Job Family	RIN Classification
Admin	Support staff
Management	Executive manager
	Senior manager
	Manager
Non Trade	Intern, junior staff, apprentice
Prof Spec	Professional
Technical	Professional
Trades	Semi professional

4. The split of management costs between the three different RIN classification categories was completed using the Management classification split file. This compiled job family with position description.

- Firstly, anomalies in pay were removed from the data, e.g. redundancy payments
- Any Managers beginning with the title *'*GM*'* or *'*Group*'* or *'*Chief*'* were assumed to be Executive managers.
- Any Managers beginning with the title *'*Manager [***]*'* or Group Manager were assumed to be Senior Managers.
- All other Managers were considered to be a *'*Manager*'*.

5. This data was manipulated to summarise the total breakdown percentage of management labour costs into the three separate management categories required for the RIN. These percentages could then be used to apportion the total Management cost percentage derived in step 3 into the three categories required.
6. The data was also used to count the number of Managerial staff for 2013/14 as the number derived in step 2 above is overstated as it includes redundant staff/positions.
7. However, an additional split was required to extract the Network Direct cost categories used in the RIN. The following four classifications required additional separation into the eight categories shown:

RIN Classification	Network & Corporate OHDs RIN Classification	Direct Network Costs RIN Classification
Intern, junior staff, apprentice	**Intern, junior staff, apprentice**	**Apprentice**
Professional	**Professional**	**Skilled non electrical worker**
Semi professional	**Semi-professional**	**Skilled electrical worker**
Support staff	**Support staff**	**Unskilled worker**

8. The results of these steps were summarised into a final cost split by the RIN classifications in the table above. This took the cost weighting for 2014 into account and the total ASLs.

ASL Numbers

1. The total year end FTE breakdown by labour category and cost type was obtained from HR . The year-end FTEs for the Network business were taken from the calculations in Table **2.6.2**. It was assumed that the average Network FTEs (ASLs) is the average of the 2012/13 and 2013/14 year end Networks employee FTE numbers. The year-end FTE numbers were then assumed to be representative of the average ASL number and were apportioned to match the derived average Networks ASL total.
2. Year-end agency data was assumed to be the ASL level for the Labour hire line.

Total Labour Cost

1. The 2013/14 labour cost component of corporate overheads, network overheads and direct network costs was then extracted from the COGNOS reporting tool.
2. Using the ratios derived above for ASLs by labour group and category, the labour costs could then be established.
3. The Employee and Labour Hire splits on the 2.11 Labour sheet were used to apportion the costs between the two lines, i.e. it is assumed that employees and Labour hire have the same costs.

Average Productive Work Hours per ASL

- It is assumed that Corporate and Network support labour is all productive time. These staff do not report time against projects so the total hours for the Corporate and Network divisions were considered to be productive labour hours.
- Additional productive time for networks support was taken from the COGNOS reporting tool.
- Direct network labour hours were also taken from the COGNOS reporting tool. These are hours directly related to projects and are therefore considered productive.
- The productive hours per ASL was then calculated by apportioning the relevant total productive hours by the split of ASL staff for that category and then dividing by the ASLs to give the appropriate productive hours per ASL. Because of the assumption that all hours are to be split based on ASLs, this has meant each labour category within the labour groups has the same productive work hours.

Stand Down Occurrences

Data for the 2014 year regarding stand down occurrences was obtained from HR. The position title and division were taken to be the drivers for the classification of occurrences. The resulting data was then pivoted to give the number of stand down instances by Labour group and category.

Use of Estimated Information

The information in this table is considered to be all estimated.

Essential Energy has used estimated information for calculating annual labour costs, ASLs, average labour costs and hours.

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 in the table for benchmarking or decision making purposes.

Table 2.11.2 Extra Descriptor Metrics for Current 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

- COGNOS cubes
- The ASL numbers derived in Table **2.11.1**

Methodology & Assumptions

- It has been assumed that the payroll split calculated at the end of April 2014 is representative of the year end 2013/14 staff split.
- The total average staff level is assumed to be the average of the 2012/13 and 2013/14 year end regulated Networks staff numbers derived in Table 2.6.2.
- Ordinary and overtime hours have been apportioned between the categories within each labour group based on the proportionate share of ASLs. This has the effect of giving each labour group within each labour category the same productive hourly Ordinary and Overtime labour hours.
- The Employee and Labour Hire ASLs have been used to apportion labour costs between the Employees and Labour Hire, i.e. it is assumed that employees and Labour hire have the same costs.
- It is assumed that Corporate support labour is all productive time, i.e. they do not form part of the overtime hours or costs. It is also assumed that Network overhead related Executive and Senior Managers do not receive overtime, so they too have been excluded from the overtime workings.

Average Productive work hours per ASL

This data was linked to the relevant column in Table 2.11.1 less the productive work hours per ASL overtime calculated below. This means that when the Ordinary Work Hours per ASL and Overtime Work Hours per ASL are added together, the total equals the Average Productive Work Hours per ASL reported in table 2.11.1

Average Productive work hours hourly rate

This column was completed after deriving the results of the overtime hours per ASL and overtime hourly rates per ASL below:

1. The Project cube data was pivoted to provide a split between overtime and ordinary costs for direct network labour costs and networks overheads labour costs.
2. Corporate overheads labour costs are all considered to be ordinary time as these staff do not generally receive overtime. It is also assumed that Network overhead related Executive and Senior Managers do not receive overtime.
3. After completing the overtime steps below, the difference between total labour cost per category and ASL and the associated overtime cost was assumed to be the ordinary labour time cost. This was then divided by the relevant number of ASLs to give the average hourly rate.

Average productive work hours per ASL Overtime

1. The COGNOS cube data was used to provide a split between overtime and ordinary hours for direct network labour costs and networks overheads labour costs.
2. Corporate overheads are all considered to be ordinary time as these staff do not generally receive overtime. It is also assumed that Network overhead related Executive and Senior Managers do not receive overtime.
3. The overtime hours were then apportioned by labour and ASL category using the ratios derived above – though for Networks related overheads, Executive and Senior Managers were excluded from the calculations.
4. Because of the assumption that all hours are to be split based on ASLs, this has meant each labour category within the labour groups has the same productive work hours.

Average productive work hours hourly rate overtime

1. The overtime hours for each labour category were derived from the COGNOS cube and apportioned using the 2013/14 calculated ASL numbers.
2. The COGNOS cube data was then used to derive the total overtime time labour costs by the three labour categories required. NB. As noted above, Corporate OHDs are assumed to have no overtime. It is also assumed that Network overhead related Executive and Senior Managers do not receive overtime.
3. These costs were then apportioned using the 2013/14 average ASL levels for each category – though for Networks related overheads, Executive and Senior Managers were excluded from the calculations - any overtime dollars for these staff have been assumed to relate to Manager overtime.

4. The derived costs could then be divided by the average productive work hours per ASL- overtime to give the average productive work hours hourly rate per ASL overtime.

Use of Estimated Information

The information in this table is considered to be all estimated.

Essential Energy has used estimated information for calculating annual labour costs, ASLs, average labour costs and hours.

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 in the table for benchmarking or decision making purposes.

Worksheet 2.12 - 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 Financial 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.
- Emergency response sourced from Table 2.9.1 of the Category Analysis RIN. No major storms were noted for 2013/14.
- 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 Financial 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.
- All PeopleSoft data has been reconciled to the Annual Financial 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 the data in the table for benchmarking or decision making purposes.

Worksheet 4.1 - Public Lighting

Table 4.1.1 - Descriptor Metrics over 2013/14 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 on 1/7/2014 as part of the end of financial year inventory report through COGNOS Report Studio using a materialised view created for the Streetlight Business Unit.
- This data was filtered to exclude Metered 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 lights are the responsibility of the owner for maintenance and replacement, and the energy consumption is not calculated using the Type7 Unmetered Billing System. As such not all metered lights have been captured in the Wasp database.

Methodology & Assumptions

The individual device types were counted from the year-end inventory report.

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 using COGNOS Report Studio. The pole volume data was supplied by Asset Strategy Development.
- GSL Breaches, Payments & Customer Complaints volume data was obtained from the Customer Affairs Business Unit. The data was extracted from the CMS database for 2013/14.
- 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 performed by contractors
Non-Routine Maintenance/Replacement	Work performed by Essential Energy
Public Lighting	Installed Type 7 Unmetered lights that are billed through Unmetered Billing System

Light Installation Volume

- Volumes were extracted from the WASP Asset History for 2013/14.
- The streetlight data was categorised between major and minor road using the wattage assumption above.

Light Replacement Volume

- Volumes were extracted from the WASP Work Task records for 2013/14.
- The streetlight data was categorised between major and minor road using the wattage assumption above.

Light Maintenance Volume

Volumes were extracted from WASP Work Task records for 2013/14.

- The streetlight data was categorised between major and minor road using the wattage assumption above.

Number of Poles Installed

The 2013/14 WASP extract was used to determine gifted poles (lights installed), volumes underlying OPEX and CAPEX failures and replacements (light replacements) and poles inspected (light maintenance). This data relates only to dedicated streetlight columns.

Quality of Supply

Mean Days

- This number was derived from extracted WASP work task data for 2013/14 where Reported By = Streetlight Web Interface to arrive at the number of customer reported faults.
- The days to repair were taken from a WASP COGNOS report and excludes weekends and public holidays.
- Calculation = total days to repair divided by total number of customer reported faults.

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.

Total Cost

Cost data was calculated as part of the financial data compilation described in section 3 Financial Data.

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 2013/14 were obtained from WASP work task records for 2013-14.
- Routine material costs were sourced from procurement Contract 10/2008 Period 4 1/9/2012 to 30/6/2013. These costs have not had any CPI increases applied to them as they were contract rates.
- Non-routine task material costs were taken from SLUOS Construction Charge Calculation Model V1.12 20071204 and have had annual CPI increases applied for each year until 2013/14. The CPI % rates used are:

2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
2.33%	4.35%	1.82%	2.85%	3.39%	1.75%

- OPEX data from PeopleSoft was used in the determination of internal labour costs.
- Unit labour rates negotiated with contractors dated 20/6/2011 were used as the standard rate for all bulk replacements and bulk maintenance.

Methodology & Assumptions

Main assumptions for this table are:

- Unit labour rate was calculated by taking 2013/14 total OPEX less Nightvision, Contract OPEX and total calculated material costs and dividing by the total work tasks performed. This gave a resulting work task rate of $232.67 (includes overheads) for non-routine Maintenance and Replacement work tasks
- A contractor maintenance labour rate of $33.61 per work task was used for bulk maintenance. This is based on the unit labour rate negotiated with contractor dated 20/6/2011.
- A contractor replacement labour rate of $115.45 per work task was used for bulk replacement costs.
- Bracket data is not collected in the current asset management system, so there is no reference to costs within this data.
- An average pole replacement cost of $5,390.33 was advised by Asset Strategy Development for the 2013/14 year.
- An average pole inspection cost was advised as $47 by Network Development Maintenance Programs.
- Non-routine material costs were sourced from SLUOS Construction Charge Calculation Model V1.12 2007/12/04. The standard luminaire raw cost was used. Costs were increased by CPI each year as described in the Source of Information section above.
- Routine material costs were sourced from Contract 10/2008 Period 4 1/9/2012 to 30/6/2013.
- Where materials costs were not available, costs of similar size materials was used.

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 2013/14 were extracted from WASP.
- The routine or non-routine material costs for each light type were noted.
- The associated labour rate was then applied to each light type and work task.

- The average unit cost by lamp type could then be calculated across all Replacement Work Tasks.
- A weighted average unit replacement cost by lamp type could then be determined.

Light Maintenance

- Maintenance Work Task records by light type and road type for 2013/14 were extracted from WASP.
- The routine or non-routine material costs for each light type were noted.
- The associated labour rate was then applied to each light type and work task.
- The average unit cost by lamp type could then be calculated across all maintenance work tasks.
- A weighted average unit maintenance cost by lamp type could then be determined.

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 demonstrates 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 the year 2013/14 has been produced through queries of 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 in the table for benchmarking or decision making purposes.

Table 4.2.2 - Cost Metrics

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

1. 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.
2. Reports and budgetary information from PeopleSoft. This data was aligned to the Annual Financial RIN based on mapping provided by SMEs.

Methodology & Assumptions

Meter Purchase

- Financial reports from PeopleSoft have been used for 2013/14. This data was aligned to the Annual Financial 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 2013/14 is based on financial reports from PeopleSoft and queries from the EDDIS database for the number of jobs completed. This data was aligned to the Annual Financial RIN based on mapping provided by SMEs.

Meter Investigation and Special Meter Reading

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

Scheduled Meter Readings

- Information for 2013/14 is based on financial reports from PeopleSoft and queries conducted by the Meter Reading team. This data was aligned to the Annual Financial 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 installed, this work is carried out 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 2013/14 is based on financial reports from PeopleSoft and queries from the EDDIS database for the number of jobs completed. This data was aligned to the Annual Financial 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 2013/14 is estimated based on volume of work orders that have been issued to the field for meter enquiries. Work orders have been removed that related to load control activities. Costs have been estimated by applying a nominal hourly rate.

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 Financial RIN based on mapping provided by SMEs.

Other Items

- All other cells were left as zeroes as no work was conducted in these categories.

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 estimated 2013/14 costs and where possible actual volumes for each of the Ancillary Service Fees it has charged.

Source of Information

- The reporting for the 2013/14 period was extracted from Essential Energy's Yambay (Power on Fusion) dispatch system.
- Expenditure was sourced from PeopleSoft Financials and COGNOS.
- The labour, plant, and stores requirement for each fee type was estimated from information provided by field based subject matter experts.
- The fee classification of each PTJ is listed in the table below. Two PTJ types have been included in the Metering Services section of the RIN and have been removed from the volumes reported in this table.
    - 'Check Meter (Enquiry)'; and
    - 'Non-chargeable Check read'.
- For the remaining fee-based services, Essential Energy has not maintained a practice of keeping detailed accounting records of the input costs associated with Miscellaneous Service Fees. The estimated costs and volumes provided in this response have been based on the revenue billed, supplemented by limited data from Essential Energy's secondary systems, and the business knowledge of subject matter experts who are involved in providing those services. Essential Energy was able to extract some additional volume data from the Contestable Works Management system (over and above that provided in the Reset RIN response that accompanied the Substantive Regulatory Proposal), and this data has been incorporated into this response.

Methodology & Assumptions

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

Service Sub-Category	PTJ Type	Fee Calculation
De-energisation - Disconnection/ Reconnection - Disconnection Completed	DNP Disconnect Visit B2B Disc Non Pay/Fuse	20 minutes on site plus travel - uplifted to cover re-energisation
De-energisation - Disconnection/ Reconnection - Technical Disconnect	Temporary Disconnect Reconnect	20 minutes on site plus travel - uplifted to cover re-energisation
De-energisation - Disconnection/ Reconnection - Pillar/Pole - Disconnection Completed	DNP Poletop Disconnect At Pole B2B Final Read/Disc at Pole B2B Disc Non Pay/Pole	1 hour plus travel (2 employees) - uplifted to cover re-energisation
De-energisation - Disconnection/ Reconnection - Vacant Property reconnect/disconnect	Final + Main Switch Final + Pull Fuse NW Final + Pull Fuse Vacant De-Energise Use on Inactive mtr B2B De-energise B2B Final Read/Fuse	20 minutes on site plus travel - uplifted to cover re-energisation

Service Sub-Category	PTJ Type	Fee Calculation
Re-energisation - Disconnection/Reconnection - Disconnection Completed (Re-en)	Re-En after DNP B2B Re-en after DNP Re-En Aft Illegal Co	No fee calculated - uplift included in de-energisation fee to cover re-energisation
Re-energisation - Disconnection/Reconnection - Pillar/Pole - Disconnection Complete (Re-en)	Reconect Poletop New Conn-Reconn (Service)	No fee calculated - uplift included in de-energisation fee to cover re-energisation
Re-energisation - Reconnection/Disconnection outside of business hours	Re-en After Hours Re-en After DNP A/Hrs B2B Re-en After Hours	20 minutes on site plus travel (using overtime labour rates)
Re-energisation - Vacant property reconnect/disconnect (Re-en)	NW Re-energisation Re-Energisation B2B Re-energise B2B Re-en Read Req	No fee calculated - uplift included in de-energisation fee to cover re-energisation
Site Visit - Disconnection - site visit		15 minutes plus travel Wasted visits associated with: 'De-energisation - Disconnection/Reconnection - Disconnection Completed', 'Re-energisation - Disconnection/Reconnection - Disconnection Completed (Re-en)' and 'De-energisation - Disconnection/ Reconnection - Technical Disconnect'
Site Visit - Disconnection/Reconnection - Pillar/Pole - site visit		15 minutes plus travel Wasted visits associated with: 'De-energisation - Disconnection/ Reconnection - Pillar/Pole - Disconnection Completed' and 'Re-energisation - Disconnection/Reconnection - Pillar/Pole - Disconnection Complete (Re-en)'
Wasted Visit - Reconnection/Disconnection outside of business hours		Fee charged at same rate as completing 'Re-energisation - Reconnection/Disconnection outside of business hours'
Wasted Visit - Move in Move out reads & special reads (wasted visit)		Fee charged at same rate as completing 'Move-in Move-out read & Special Read'
Wasted Visit - Vacant Property reconnect/disconnect (wasted visit only)		15 minutes plus travel Wasted visits associated with: 'De-energisation - Disconnection/ Reconnection - Vacant Property reconnect/disconnect' and 'Re-energisation - Vacant property reconnect/disconnect (Re-en)'

Service Sub-Category	PTJ Type	Fee Calculation
Off Peak Conversion	Check Tariff (Enquiry) HW Ch CL1 to CL2 HW Ch CL2 to CL1 HW Ch CL2r to Dubbo HW Ch CL3 to CL2 Nth HW Ch CL3 to CL1 Nth B2B Change Controlled Load B2B ChangeTariff	10 minutes plus travel Re-programming only
Move-in Move-out read & Special Read	Final Read-Leave Conn (new Cust) Special reading-Elect Chargeable Check read B2B Checkread B2B 915 Special Read B2B Check Read Final Reading Only Final + New Occupant Retailer Churn	10 minutes plus travel
Meter Test	B2B Meter Test	2 hours and 30 minutes plus travel (two visits) Usually remove meter and send for testing
Other Wasted Visits		15 minutes plus travel Wasted visits associated with: 'Off Peak Conversion' 'Meter Test'

- For 2013/14 the wasted visit volumes were calculated using the 'Completion Status' from Yambay. PTJs with an 'Incomplete' status were counted as wasted visits.
- Travel time was estimated using 2012/13 volumes. Total project hours were taken from two project types - Non Routine Meter Reads (11105) and Metering and Load Control (11100). Estimated labour hours (provided by subject matter experts) were applied to each PTJ type and the remainder (total actual project hours - estimated project hours) divided against the total volume of PTJs to provide an average travel time of 27 minutes per PTJ.
- To calculate the expenditure for each service subcategory, the volumes were converted into labour hours (based on labour estimates including travel). The labour hours totals for each subcategory were then represented as a percentage of total estimated hours. These percentages were applied to the total expenditure for Non-Routine Meter Reads and Metering & Load Control project types, to provide an estimated expenditure for each subcategory.
- 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.
- Subject matter experts, who are familiar with the work associated with each service, have made general assumptions around the average time required to complete each service. In addition, the estimators have made allowance for average material and direct costs per service (including fleet where travel is involved). In the case of fleet costs, the estimate is based on the organisations standard fleet rate per labour hour.

Use of Estimated Information

The data in this table is mostly estimated information as noted in the methodology 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 data in this table has been prepared in accordance with the requirements of the Notice.

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:

- Essential Energy and Private owned poles have been included. Private assets are included as these are private poles that EE 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 two methods.
  - Those In-Service poles that have had a 'Pole – Reinstate' work task recorded against them
  - Those poles with a 'Staked Pole' attribute.
- 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.
- The Age of a Staked Pole is determined by the age of the staking, not the installation date of the pole.
- 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		Fibre Composite

- 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	LV
Street Light Column	Blank	LV
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).

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 WASP 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] as determined below:

Distribution Transformers

- Only Substation Sites with an Owner = 'Essential Energy'
- All Transformers that are currently in use (In Service)

- Includes SWER Isolators and Step Up/Down Transformers. This varies to table 3.5 Physial 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 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 Substation Site's 'Date Constructed'. If this is not available, then Year has been derived as follows (note this has only been required in 2% of cases):
    - if Substation Site 'Date Constructed' is blank, then use most recent 'Date Manufactured' from the Substation Site's associated children Transformer(s).
    - 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.
- Pole and Kiosk mounted Transformers > 22kV have been recorded under the 'Other' category.

Zone Substation Auxiliary Transformers

- ZS Auxiliary Transformers with a Service Status indicating it is in service or will be in future ('In Service','Not Applicable','Out of Service','System Spare','Under Construction','Under Repair').
- 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.

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 was only performed 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 was only performed 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.

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.

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 three 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. 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 three 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'.
- Operational 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'
- 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/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/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).
- Fuses greater than 11 kV have been reported under the 'Other' category.

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 was only required in < 0.05% of cases.
- Year has been obtained from the ZS Circuit Breaker's 'Year of Manufacture'. If this is not available, then Year has been derived as follows (this was required 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. Estimate the number of Fuses/Switches that are part of Substations and not discretely recorded in WASP

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

Pole mounted Substation Sites:

i. The quantity of pole mounted Substation Sites was determined from WASP. It was determined there are approximately 128,500.

ii. 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.

iii. The estimated quantity of fuses for overhead/pole mounted Substation Sites was determined by multiplying step 1 and 2:

- LV Fuses = 1.5 x 128,500 = 192,750
- HV Fuses = 1 x 128,500 = 128,500

iv. The profile of Primary Voltage for existing pole mounted Substation Sites was determined from WASP as follows:

Voltage	Count	Percentage	Maping
11kV	86928	67%	<= 11kV
12.7kV	3490	3%	>11 and <=22kV
19.1kV	5235	4%	>11 and <=22kV
22kV	33522	26%	>11 and <=22kV
33kV	1342	1%	>22 and <=33kV

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

v. These percentages were applied to the estimated counts in step 3 to determine the quantities per voltage group:

- LV Fuses
  - LV = 100% x 192,750 = 192,750
- HV Fuses
  - <=11kV = 67% x 128,750 = 86,095
  - >11kV and <=22kV = 32% x 128,750 = 41,120
  - >22kV and <=33kV = 1% x 128,750 = 1,285

vi. All of these were categorised as 'Fuse'.

Ground Mounted/Enclosed Substation Sites:

i. The quantity of ground mounted/enclosed Substation Sites was determined from WASP. It was determined there are approximately 6,250.

ii. 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.

iii. The estimated quantity of fuses for ground mounted/enclosed Substation Sites was determined by multiplying step 1 and 2:

- LV Fuses = 4 x 6,250 = 25,000
- HV Fuses = 2 x 6,250 = 12,500

iv. 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

Category	Count	Percentage
Circuit Breaker	**2378**	**10.93%**
11kV	1	0.00%
LV	2377	10.93%
Fuse	**19376**	**89.07%**
22kV	7	0.03%
LV	19369	89.04%
(blank)		**0.00%**
(blank)		0.00%
Grand Total	**21754**	**100.00%**

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

HV Switchgear

Category	Count	Percentage
Circuit Breaker	**10352**	**24.84%**
11kV	6814	16.35%
22kV	1089	2.61%
33kV	51	0.12%
6.35kV	10	0.02%
LV	2377	5.70%
(blank)	11	0.03%
Fuse	**27971**	**67.12%**
11kV	7988	19.17%
22kV	502	1.20%
33kV	103	0.25%
LV	19373	46.49%
(blank)	5	0.01%
Operational Switch	**3351**	**8.04%**
11kV	1973	4.73%
22kV	1372	3.29%
LV	2	0.00%
(blank)	4	0.01%
(blank)		**0.00%**
(blank)		0.00%
Grand Total	**41674**	**100.00%**

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

v. 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 25,000 = 2,750
  - LV Fuse = 89% x 25,000 = 22,250

- HV Switchgear
  - <=11kV Circuit Breaker = 35% x 12,500 = 4,375
  - <=11kV Fuse = 41% x 12,500 = 5,125
  - <= 11kV Operational Switch = 10% x 12,500 = 1,250
  - >11kV and <=22kV Circuit Breaker = 5% x 12,500 = 625
  - >11kV and <=22kV Fuse = 3% x 12,500 = 375
  - >11kV and <=22kV Operational Switch = 6% x 12,500 = 750

vi. 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 current 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 are considered part of Substation Sites and are not discretely recorded in WASP as follows has been entirely estimated based on knowledge of the network and existing data in WASP.

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:

- All streetlights regardless of owner.
- Only streetlights with a Service Status = 'In Service'
- Streetlights with a Lighting Category = 'Quarantined' were excluded
- Streetlights with a Lighting Category = 'Traffic Route Lighting' 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 asset’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.
- Staked Poles that are Streetlight Poles have been deducted from the 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.

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.

Regulators

Compliance with Requirements of the Notice

The information provided shows the number of Essential Energy owned Regulator 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 & Assumptions

SQL Logic:

- Only Essential Energy assets included.
- Only In Service assets included.
- Includes assets categorised in WASP as ‘Regulator Sites’
- Age is determined from ‘Date Constructed’ attribute.
- If ‘Date Constructed’ is blank then the age is determined from the parent pole’s ‘Date Installed’ attribute.
- Those assets that do not have a ‘Date Constructed’ or a parent pole ‘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, ‘Unknown’, ‘6.35kV’, ‘66kV’, ‘110kV’ or ‘132kV’ then the asset’s maintenance area primary voltage is used instead (determined from Smallworld data).

Use of Estimated Information

Essential Energy has used some estimated information for:

- The asset’s age when there is no ‘Date Constructed’ for that asset. The estimation uses the parent pole’s ‘Date Installed’ which gives a fairly accurate estimation. Those assets that do not have a ‘Date Constructed’ or a parent pole ‘Date Installed’ have been prorated across the existing asset 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.

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.

Reactors

Compliance with Requirements of the Notice

The information provided shows the number of Essential Energy owned Reactor 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 & Assumptions

SQL Logic:

- Only Essential Energy assets included.
- Only In Service assets.
- Includes assets categorised in WASP as 'Reactor Sites'.
- Age is determined from 'Date Constructed' attribute.
    - If 'Date Constructed' is blank then the age is determined from the parent pole's 'Date Installed' attribute.
    - Those assets that do not have a 'Date Constructed' or a parent pole 'Date Installed' have been prorated across the existing asset age profile.
- All assets are assumed to be 'SWER' voltage.
- '25' kVAr is assumed if the 'kVAr' attribute on the Reactor Site was blank.

Use of Estimated Information

Essential Energy has used some estimated information for:

- The asset's age when there is no 'Date Constructed' for that asset. The estimation uses the parent pole's 'Date Installed' which gives a fairly accurate estimation. Those assets that do not have a 'Date Constructed' or a parent pole 'Date Installed' have been prorated across the existing asset age profile.
- All assets are assumed to be 'SWER' voltage.
- '25' kVAr is assumed if the 'kVAr' attribute on the Reactor Site was blank.

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.

Zone Substation Power Transformers

Compliance with Requirements of the Notice

The information provided shows the number of distribution Zone Sub Power Transformers owned 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:

- All ZS Power Transformer assets owned by Essential Energy.
- All ZS Power Transformers with a Service Status of 'In Service'.
- Excludes ZS Power Transformers with a Type of 'Regulators' or 'SWER Isolators'.
- 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 then they were prorated across the existing asset age profile.

Use of Estimated Information

- Essential Energy has used estimated information when there is no 'Year of Manufacture' for the ZS Power Transformer as per logic detailed above. This was only performed in <1% of cases. The methodology used to estimate the date in these instances is considered to provide a reasonable approximation. Those assets that do not have a 'Year of Manufacture' or 'Date Installed' have been prorated across the existing asset age profile.
- Essential Energy has used estimated information when there is no 'Maximum Rating (MVA)' for the ZS Power Transformer as per the logic detailed above. This was only performed in <1% of cases. The methodology used to estimate the MVA in these instances is considered to provide a reasonable approximation and was determined using averages and most common MVA by Power Transformer Type.

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.

Line Fault Indicators

Compliance with Requirements of the Notice

The information provided shows the number of Essential Energy owned Line Fault Indicators 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:

- Only Essential Energy assets included.
- Only 'In Service' assets.
- Includes assets categorised in WASP as 'Line Fault Indicator Sites'.
- Age is determined from 'Date Constructed' attribute.
    - If 'Date Constructed' is blank then the age is determined from the parent pole's 'Date Installed' attribute.
    - Those assets that do not have a 'Date Constructed' or a parent pole '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, 'Unknown', '6.35kV', '66kV', '110kV' or '132kV' then the asset's maintenance area primary voltage is used instead (determined from Smallworld data).

Use of Estimated Information

Essential Energy has used some estimated information for:

- The asset's age when there is no 'Connection Date' for that asset. The estimation uses the parent pole's 'Install Date' which gives a fairly accurate estimation. Those assets that do not have a 'Date Constructed' or a parent pole 'Date Installed' have been prorated across the existing asset 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.

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 - 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 WASP database using SQL and grouping of data in Excel.

Methodology & Assumptions

- The total number of installs for 2013/14 was calculated by query from all meter movements processed through Secure Web forms portal. Total meters installed 44,564 made up of 38,137 meters installed by ASP's and 6,427 by Essential Energy.
- Total number of meter removals was calculated by taking the difference in year-end total meter count from the EDDIS database between 2013/14 and 2012/13 and also taking the number of meters installed into account. ie.
    - Meters removed = Meters installed -(Total meters 2013/14 - Total meters 2012/13) which gave 31,565
- 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 WASP database and the assumptions and estimations that have been used. Caution should be applied if using this data for benchmarking or decision making purposes.

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.

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.

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.

Use of Estimated Information

Information is based on actual data readings from each supply point.

Reliability of Information

The maximum demand information is considered reliable.

Worksheet 5.4 - MD & Utilisation-Spatial

Table 5.4 - 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 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:

The time period in table **5.4** was nominated as the 2013/14 financial year. However, for forecasting purposes Essential Energy defines the time period based on seasons. In order to provide the actual loads for 2013/14 the winter of 2013 and the summer of 2013/14 was used, which included loads from April 1st 2013 to March 31st 2014. 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 STS's and ZS's have reliable data recording devices. A minor number of the very small ZS's 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 sensitised visually to eliminate abnormal peaks to determine the true peak demand.
- **Coincident Maximum Demand**
  Raw adjusted maximum demand coincident with the total system peak is of little use in forecasting and planning for network constraints in the distribution network As such, Essential Energy has not previously recorded the coincident demand at the time of Essential Energy's system peak for its STS's or ZS's. The coincident demand for the 2013/14 year has been recorded while extracting the data.
- **Adjustments – Embedded Generation:**
  Only discrete embedded generation units that impact the demand of the STS's or ZS's are included in the table. Rooftop photovoltaic generation are not shown as their impact is included in the actual and forecast demand of the individual ZS's. 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 STS's or ZS's.

- **Weather Corrected MD:**
  Essential Energy has no weather corrected data for 50% POE or 10% POE. Therefore no weather corrected data has been included.
- **Date MD Occurred:**
  The date and time of the coincident and non-coincident peak demands were recorded during data extraction.
- **Winter/Summer Peaking:**
  Essential Energy defines the seasons as between 1st April and 30th September for winter, and 1st October to 31st March the next year for the summer period.

Use of Estimated Information

Refer to above methodology and assumptions section for the use of estimated information.

Reliability of Information

Most data for the 2013/14 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 (for 2013-14)

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 *'*Category Analysis RIN Table **6.3***'*.

The name of the spreadsheet containing the mapping of Essential Energy cause list to the AER RIN cause list is *'*Cause Mapping*'*.

Methodology & Assumptions

The data has been collected and collated in line with the Economic 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.

Sustained interruption has been assumed to be any interruption of one minute or greater duration, i.e. 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.

Use of Estimated Information

Not applicable as actual information has been used.

Reliability of Information

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