Basis of preparation

> Response to economic benchmarking RIN 2013-14

1. Contents

Purpose

The Economic Benchmarking Regulatory Information Notice (Economic Benchmarking RIN) requires Essential Energy to prepare a Basis of Preparation. By this, the AER mean that for every variable in the Templates, Essential Energy must explain the basis upon which we prepared information to populate the input cells. The Basis of Preparation must be a separate document (or documents) that Essential Energy submits with its completed Templates. The AER will publish Essential Energy's Basis of Preparation along with the Templates.

This document is Essential Energy's Basis of Preparation in relation to the Audited Information required to be submitted to the AER on 31 October 2014.

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.

To do this, the AER recommended that Essential Energy structures its Basis of Preparation with a separate section to match each of the worksheets titled '3.1 Revenue' to '3.7.4 Weather Stations' in the Templates.

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

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

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

1	Demonstrate how the information provided is consistent with the requirements of the Notice
2	Explain the source from which Essential Energy obtained the information provided
3	Explain the methodology Essential Energy applied 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: (i) why an estimate was required, including why it was not possible for Essential Energy to use Actual Information;

	(ii) 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.
5	For Variables that contain Financial Information (Actual or Estimated) the relevant Basis of Preparation must explain if accounting policies adopted by Essential Energy have Materially changed during any of the Regulatory Years covered by the Notice: (i) the nature of the change; and (ii) the impact of the change on the information provided in response to the Notice. 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 Templates. In relation to providing an audit opinion or making an attestation report on the Templates presented by Essential Energy, an auditor or assurance practitioner shall provide an opinion or attest by reference to Essential Energy's Basis of Preparation.

Structure of this document
The document is structured as follows:

- We outline our general approach to developing our response to the RIN. We identify key systems used to provide data, note issues relating to data quality, and make comments on the reliability of the data for economic benchmarking purposes.

- We set out our response to worksheets 3.1 to 3.7.4, in accordance with the AER's instructions. We note that Worksheet 1 requires no input material.

General approach

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

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

Essential Energy has explained the reliability of the information, and set out where caution should be applied by the AER in the application of the data to economic benchmarking models. We note that this issue has been raised with the AER in consultations relating to this notice.

1.1 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.

1.2 Data quality issues

In previous consultations on the RIN, we have raised significant concerns with providing historical data in the form required by the AER. We continue to raise our concerns in relation to the detailed templates for economic benchmarking purposes and have outlined in this Basis of Preparation where caution should be applied by the AER in the application of the data to economic benchmarking models.

1.3 Approaching our 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 our systems, we would have a reasonable excuse under section **28(5)** of the NEL not to comply with that element of the notice. We have strong doubts that a RIN can require a business to prepare information by way of estimate that cannot be reasonably derived from information currently held in its systems.

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

Despite this, Essential Energy has prepared and included the estimated data using 'best estimates' given the resources and time available to complete the detailed templates.

1.4 Recognition by AER that 'best estimates' are not robust

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

1.5 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 on the basis which Essential Energy considers provides 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 variations have been identified and explained.

1.6 Reliability of applying data to economic benchmarking

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

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

Worksheet 3.1 – Revenue

3.1.1 Revenue grouping by chargeable quantity, and

3.1.2 Revenue grouping by customer type or class

Compliance with requirements of the notice

This section contains data on the revenue allocated to the Regulated Network business as shown in the respective year's regulatory returns as per the requested groupings. The revenue has been determined on an 'as billed' basis.

Source of information

Total revenue amounts have been sourced from the Annual Regulatory Accounts with the inclusion of the miscellaneous and monopoly fees and emergency response works.

The Finance Gross Margin report including accruals has been used to prorate the total revenue into the requested chargeable quantity and customer type line items.

The Finance Gross Margin report including Accruals is provided by Finance as part of the end of year Board report and is subject to statutory audit.

Revenue for Connection Services DREV0111 relates to revenue from Miscellaneous and Monopoly Services (MMS) and is sourced from data used to compile the Annual Regulatory Accounts.

Revenue for SLUOS DREV0112 (Alternative Control) is sourced from the audited Annual Regulatory Accounts.

Revenue from other sources DREV0113 relates to Emergency Recoverable Works (ERW) and is sourced from data used to compile the Annual Regulatory Accounts.

Revenue from Other Customers DREV0206 relates to MMS and ERW income and is linked to the tables above.

Methodology and Assumptions

Total revenue from SLUOS is taken from the Annual Regulatory Accounts.

The Finance Gross Margin report including Accruals is provided by Finance as part of the end of year Board report and is subject to statutory audit.

The Finance Gross Margin report provides Distribution consumption at a segment level.

The categories requested in Table 3.1.1 are not provided in either the Regulatory Accounts or the Finance Gross Margin report, therefore these have been prorated on 2012-13 dollars.

The following tables below show how the total revenue amounts from the Annual Regulatory Accounts have been apportioned using data from the Finance Gross Margin report into the RIN template, for Table 3.1.1 and Table 3.1.2.

Table 3.1.1

Variable Code	Variable	Standard Control Services	Alternative Control Services
DREV0101	Revenue from Fixed Customer Charges	Total Reg Accounts prorated to 2013 proportion	n/a
DREV0102	Revenue from Energy Delivery charges where time of use is not a determinant	Total Reg Accounts prorated to 2013 proportion	n/a
DREV0103	Revenue from On–Peak Energy Delivery charges	Total Reg Accounts prorated to 2013 proportion	n/a
DREV0104	Revenue from Shoulder period Energy Delivery Charges	Total Reg Accounts prorated to 2013 proportion	n/a
DREV0105	Revenue from Off–Peak Energy Delivery charges	Total Reg Accounts prorated to 2013 proportion	n/a
DREV0106	Revenue from controlled load customer charges	Total Reg Accounts prorated to 2013 proportion	n/a
DREV0107	Revenue from unmetered supplies	Total Reg Accounts prorated to 2013 proportion	
DREV0108	Revenue from Contracted Maximum Demand charges	Total Reg Accounts prorated to 2013 proportion	n/a
DREV0109	Revenue from Measured Maximum Demand charges	Total Reg Accounts prorated to 2013 proportion	n/a
DREV0110	Revenue from metering charges	n/a	n/a
DREV0111	Revenue from connection charges	Sourced from data used to compile the annual regulatory accounts	n/a
DREV0112	Revenue from public lighting charges	n/a	SLUOS charges as reported in annual regulated accounts
DREV0113	Revenue from other Sources	Sourced from data used to compile the Annual Regulatory Accounts	n/a

Table 3.1.2

Variable Code	Variable	Standard Control Services	Alternative Control Services
DREV0201	Revenue from residential Customers	Reg Accounts proportioned to Finance Gross Margin – Residential incl Controlled Load	n/a
DREV0202	Revenue from non-residential customers not on demand tariffs	Reg Accounts proportioned to Finance Gross Margin – Business Continuous Business TOU <100 MWH Business TOU >100 MWH	n/a
DREV0203	Revenue from non-residential low voltage demand tariff customers	Reg Accounts proportioned to Finance Gross Margin – Low Voltage Demand	n/a
DREV0204	Revenue from non-residential high voltage demand tariff customers	Reg Accounts proportioned to Finance Gross Margin – Industrial (incls High Voltage, Subtransmission, Site Specific, Inter Distributor Transfers)	n/a
DREV0205	Revenue from unmetered supplies	Reg Accounts proportioned to Finance Gross Margin – Streetlighting	n/a
DREV0206	Revenue from Other Customers	Revenue from Miscellaneous and Monopoly fees and Emergency Recoverable Works	n/a

Use of estimated information

As the Finance Gross Margin report and the previous years Economic Benchmarking RIN were used to prorate the total revenue figures from the Annual Regulatory Accounts into individual line items, the information is considered to be estimated.

Material accounting policy changes

n/a

Reliability of information

The total revenues provided in these tables are considered to be reliable, however the splits into different categories are based on assumptions and estimates and caution should be used when using this for benchmarking or decision making purposes.

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

Compliance with requirements of the notice

Essential Energy has reported the penalties or rewards of incentive schemes in this table.

Revenues reported in Table 3.1.3 reflect the effect on revenues of incentive schemes in the year that the penalty or reward is applied.

Source of information

Data has been sourced from the incentive scheme payments which Essential Energy has received.

Methodology and Assumptions

This table requires data about the payments received by Essential Energy under the EBSS, STPIS, and other schemes. As the EBSS and STPIS schemes are yet to commence for Essential Energy, there is no amount to report. The only incentive scheme applicable to Essential Energy at this time is the DMIS, which provides the company with an allowance of $600,000 annually. As such, no methodology was required to arrive at this amount.

Use of estimated information

As the data provided in this table is factual, it was not necessary to estimate any information.

Material accounting policy changes

n/a

Reliability of information

The data provided in this table is considered to be reliable.

Worksheet 3.2 – Opex

3.2.1.1 Current opex categories and cost allocations

Compliance with requirements of the notice

This section contains data on various opex categories allocated to the Regulated Network business.

Source of information

Data has been sourced from previous Annual Regulatory Accounts and budgets.

Methodology and Assumptions

The data is the same as the figures in Table 3.2.1.2A.

Use of estimated information

Refer to methodology and assumptions section mentioned above.

Material accounting policy changes

Refer to methodology and assumptions section mentioned above.

Reliability of information

The data was sourced from the Annual Regulatory Accounts and is therefore considered to be reliable.

3.2.1.2 A, B & C Historical opex categories and cost allocations

Compliance with requirements of the notice

This section contains data on various opex categories allocated to the Regulated Network business as shown in the regulatory returns.

Essential Energy has reported its historical Opex categories in accordance with the Opex activities within the Annual Reporting Requirements.

Source of information

Data has been sourced from the Annual Regulatory Accounts.

Methodology and Assumptions

The data for all opex categories was sourced from the Annual Regulatory Accounts.

The data contained within the Alternative Control Services section of the Other Network Maintenance Costs line was sourced from the Public Lighting opex section of the Annual Regulatory Accounts.

Use of estimated information

There has been no use of estimated information in the opex categories mentioned above. Where figures greater than zero have been entered, the numbers are linked

back to other data in the EB RIN, which is ultimately sourced from opex figures disclosed in the Annual Regulatory Accounts.

Material accounting policy changes

Essential Energy has not undertaken any material changes in accounting policies.

Reliability of information

The data used for the compilation of this expenditure was sourced from the Annual Regulatory Accounts and is therefore considered to be reliable.

3.2.2.1 Opex consistency - current cost allocation approach

Compliance with requirements of the notice

Essential Energy believes there are no material differences in either our cost allocation approach or method of preparation of the Annual Regulatory Accounts. Therefore this table replicates Table 3.2.2.2.

3.2.2.2 Opex consistency - historical cost allocation approaches

All rows except for those relating to Metering and Connection Services, see next section.

Compliance with requirements of the notice

This section contains data on various opex categories allocated to the Regulated Network business as shown in the regulatory returns.

Essential Energy has reported Opex in accordance with the requirements of the Cost Allocation Approach and the Annual Regulatory Accounts that were in effect.

Source of information

Data has been sourced from other tables in the Economic Benchmarking RIN, namely, Table 3.2.1.2A Historical opex categories and cost allocations.

Methodology and Assumptions

Opex for Network Services
It was assumed that all of Network Services expenditure was already captured in Table 3.2.1.2A Historical opex categories and cost allocations. As such, this row is equal to the Total Opex row in that table, less any expenditure captured in the remainder of Table 3.2.2.2 (including any expenditure contained in the Alternative Control Services section of Table 3.2.2.2).

Opex for Public Lighting
The data in this row is equal to the data in the Alternative Control Services section of the Other Network Maintenance Costs row in Table 3.2.1.2 Historical opex categories and cost allocations, which solely comprises public lighting costs.

Opex for amounts payable for easement levy or similar direct charges on DNSP
Essential Energy has no such amounts.

Opex for transmission connection point planning
Essential Energy has no such amounts.

Use of estimated information

There has been no use of estimated information in the opex categories mentioned above. Where figures greater than zero have been entered, the numbers are linked back to other data in the EB RIN, which is ultimately sourced from opex figures disclosed in previous RINs.

Material accounting policy changes

Essential Energy have not undertaken any material changes in accounting policies around the items reported in Table 3.2.2.2 over the period requested.

Reliability of information

The totals used for the compilation of this expenditure were ultimately sourced from the RIN, and are therefore considered to be reliable. However, the split into the different categories is based on assumptions and estimates so caution should be used when using it for benchmarking or decision making purposes.

3.2.2.2 Metering and Connection Service expenditure

Compliance with requirements of the notice

This section contains data on metering and connection operating expenditure allocated to the Regulated Network business.

Essential Energy has reported Opex in accordance with the requirements of the Cost Allocation Approach and the Annual Regulatory Accounts.

Source of information

Data has been sourced from workpapers (mainly trial balances) used in preparation of the Annual Regulatory Accounts.

Methodology and Assumptions

The methodologies applied to estimate opex for metering and connection operating expenditure was extracting data from the annual regulatory trial balances at a departmental level or at a project type level.

For metering, operating expenditure data was extracted for departments containing “meter” or “M-R” (meter reading). In addition data was extracted for operating expenditure project types not in these departments which contained “meter” or “MTR” and were not related to contestable activities.

For connections, operating expenditure data was extracted on departments containing “conn” (connections) and operating project types containing “conn”.
Data was extracted from the annual trial balance.

Use of estimated information

Essential Energy has used estimated information for the proportion of costs relating to connection service activities that would be included as part of project type 11105 Non-Routine Meter Reading. This is based upon an analysis of PTJs in Energy with volumes multiplied by estimated hours.

Material accounting policy changes

Essential Energy has not undertaken any material changes in accounting policies.

Reliability of information

Most of the data used for the compilation of the metering service and connection service expenditures was sourced from regulatory account work files for the respective years, and is therefore considered reliable. However records are not kept historically for reporting expenditure solely related to metering and connection services. Therefore these amounts are based on assumptions and estimates so caution should be used when using this information for benchmarking or decision making purposes.

3.2.4 Opex for high voltage customers

Compliance with requirements of the notice

This section contains data on the opex that would have been incurred by Essential Energy, had it owned the transformer assets owned by its high voltage customers.

Source of information

Information on the number of high voltage customers connected to the Essential Energy network was sourced from an Excel database maintained by Essential Energy's HV Network Connections Group and validated by way of a HV customer report from Essential Energy's customer management system Energy/Peace.

Historical maximum monthly demand was extracted from Essential Energy's metering database 'EDDIS' which in turn supplies data for the network billing function.

HV customer connection dates were sourced from signed Customer Connection Agreements stored in Essential Energy's document database 'Objective' (copies also located in the HV Connection Group shared drive).

Methodology and Assumptions

HV customer data includes maximum kVA per connection customer.

As no data is held on private customer high voltage assets the following assumptions were made to develop an asset base for estimating costs:

1. Customers with a demand over 5,000kVA and/or a connection voltage of 66kV or above have a zone substation to reduce voltages to distribution level, typically 11kV, excluding generators.

2. Customers with a demand less than 5000kVA and connection voltage of less than 66kV have no zone substation to reduce voltages for connection to distribution substations.

3. The number of zone substations as per assumption 1 above is one per connection.

4. The number of distribution substations is one per 500kVA of demand or part thereof.

5. No allowance has been made for overhead or underground circuits or switchgear as there is no basis on which to determine this.

Whilst there is no detail of the asset types, condition or required maintenance a simple estimate of an assumed annual maintenance cost has been developed for the quantities that were derived in the assumptions above. This estimate is of direct costs only, and excludes overhead costs.

Internal costing estimates, covering Labour, Fleet, Materials and Travel costs were used to estimate the costs of sites falling under and over 5MVA. Maintenance and running costs for HV sites over 5 MVA are significantly higher than for those which are under 5 MVA. As this covered only direct costs, overhead costs have been excluded.

Reference was made to a workpaper file used in the compilation of the 2013 Economic Benchmarking RIN, which analysed project costs for the 2013 financial year. A vlookup formula was applied to the Max kVA column in the data, to pull the appropriate level of costs against each HV site.

The rationale for showing direct costs only and excluding overhead costs is that Essential Energy should only be reflecting the incremental costs to the business.

Use of estimated information

A very high level estimate has been used to prepare the table of costs. This table of costs has been applied to an assumed asset base in circumstances where the quantity, type, age nor condition of the components is known to Essential Energy. The type of equipment used by each HV site was estimated based on maximum demand and the costs associated with each site was estimated based on estimates of Essential Energy's own running costs for such equipment.

Material accounting policy changes

Essential Energy has not undertaken any material changes in accounting policies.

Reliability of information

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

The data used for the compilation of this expenditure is highly unreliable and it is not advised that it can be used for any purpose with any degree of certainty. It should not be used for the purposes of any benchmarking activity. Essential Energy cannot report with any level of accuracy, on the equipment owned by its high voltage customers, or the operating and maintenance costs of equipment which it does not own or manage.

Worksheet 3.2.3 – Provisions

3.2.3 Provisions

Compliance with requirements of the notice

This section contains data on provisions allocated to the Regulated Network business as shown in the 2014 Economic B RIN.

Essential Energy has performed the following:

- reported financial information on provisions for Standard Control Services in accordance with the requirements of the Cost Allocation Approach and the Annual Regulatory Accounts that were in effect for the current Regulatory Year
- reported financial information for each of its individual provisions
- specified the name of the provision and added Variable codes for line items
- reported provisions in accordance with the principles and policies within the Annual Reporting Requirements for the current Regulatory Year

Financial information on provisions reconcile to the reported amounts for provisions in the Annual Regulatory Accounts. Immaterial differences in opening and closing values were noted due to the rounding of numbers.

Source of information

Data has been sourced from workpapers used in the preparation of the 2014 statutory financial statements, and workpapers used in the preparation of the 2014 Annual Regulatory Accounts.

Methodology and Assumptions

The sign convention applied is consistent with the Annual Regulatory Accounts where provision values are expressed as negatives, with provision increases expressed also as negatives.

The methodology and assumptions employed for 2014 are similar to those applied in the previous Economic Benchmarking RIN. The Regulated Network portion of the movement in the respective provision was estimated, and an estimated component relating to capital expenditure was calculated on labour related provisions.

The assumption has been applied that a portion of the increase in employee related provisions (employee entitlements, worker's compensation, and defined benefit superannuation) directly feeds through into capital projects from the labour overhead process. This process allocates various labour overheads (eg. leave provision increases, superannuation expense, etc) across operating expenditure and capital expenditure. No allowance has been made for any indirect form of capital allocation of the operating expenditure component of these provisions. For 2014 other provision types, as a general rule, would have had increases/decreases applied against an account range within mostly corporate departments (eg. 130 General Counsel). The corporate allocation process would then have shifted these costs within operating expenditure with no direct capital impact. For the purpose of the 2014 return, and similar to labour on costs, no allowance has been made for any indirect capital allocation process.

For the 2014 Economic Benchmarking RIN data on the increase in the provision over time (interest unwinding) and the effect of any change in discount rate have been split out for employee entitlements and the defined benefit superannuation provision. In reference to the defined benefit superannuation provision this data has been provided by the actuary for the EISS which is the major component of this provision. The employee entitlement data has been estimated by the senior commercial accountant responsible for payroll.

Use of estimated information

- Where the provision does not relate wholly to the Regulated Network, Essential Energy has used estimated information for the Regulated Network business' share of provision movements, and the component of provision increases/decreases in the employee related provisions directly transferred to capital projects.

  An approach consistent with that applied in the 2011 to 2013 Economic Benchmarking RINs was adopted to derive the required movement data. This methodology has been subject to external audit in those years and has been carried on for 2014. Please note that for 2014 Essential Energy is not required to provide a regulatory balance sheet.
- The component of labour related provisions estimated to have been directly transferred to capital projects as part of the labour overhead allocation process is based upon the rate of labour overheads transferred to capital from the 2014 Board Labour report.

Material accounting policy changes

Essential Energy has undertaken a change in accounting policy during 2014 relating to a change in AASB119 Employee Benefits. This change has resulted in a higher expense being recognised than in prior years, with a corresponding opposite impact upon actuarial gains/losses in other comprehensive income. The net impact upon total comprehensive income, and the provision balance itself, is nil.

Reliability of information

Data used for the initial provision tables has been sourced from workpapers that support both the statutory accounts and the Annual Regulatory Accounts for 2014. Therefore the information provided in this table is considered to be reliable.

Worksheet 3.3 – Assets (RAB) Standard Approach

3.3.1 Regulatory Asset Base Values,

3.3.2 Asset Value Roll Forward,

3.3.3 Total Disaggregated RAB Asset Values, and

3.3.4 Asset Lives – estimated residual service life

Compliance with requirements of the notice

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

Essential Energy has:

- Reported its RAB assets in line with the asset input categories for economic benchmarking.
- Separated the Network Services component of Standard Control services to extract Metering Services.
- Reported its RAB values in accordance with the standard approach in section 4.1.1 and the assets (RAB) Financial Reporting Framework in box 7 of the Economic Benchmarking RIN for DNSPs Instructions and Definitions document.
- Included Substation land in the Substation categories.
- Reported 0s in the Alternative Control Services RAB tables as the AER has not developed a RAB for these services and Metering Types 5&6 do not become part of the Alternative Control RAB until the beginning of 2014-15.
- Reported capital contributions as DRAB13 .
- No dual function assets.
- Reconciled the data between tables 3.3.1 and 3.3.2.
- Reported an Easements value as this data has been previously recorded.
- Used an average of the opening and closing RAB values for each category in completing Table 3.3.
- Reported asset lives in accordance with the category definitions provided in Chapter 9.
- Calculated asset lives by weighting the lives of individual assets within that category.

Source of information

In this section, we explain the source from which Essential Energy obtained the information provided.

There are five main sources used to obtain the information for the RAB workings:

1. The workings from the 2009-13 RAB calculations have been used to determine the opening RAB values and estimated service life of new assets.
2. The System assets Fixed Asset Register (FAR) as at 30 June 2014. This contains the depreciated cost base at that date. It has been used to determine the percentages to disaggregate RAB categories in the RFMs that could not be directly apportioned. It has been assumed that the asset splits in the FAR are consistent with the asset splits in the RAB. The rates for 2014 were compared to the rates used for 2009-13 (based on the 2013 FAR) and found to be materially consistent. On this basis, the 2014 FAR derived rates have been used for 2014.
3. 2014 Regulatory Accounts and associated capex workpapers have been used to derive the 2014 additions data.
4. The AER Roll Forward Model (RFM) for the period 2009-2014 (as lodged with the SRP) with updated actuals capex spend for 2014 (based on the data provided from items 3 above) and an updated 2014 CPI rate of 2.45% (previously 2.5%) calculated in accordance with AER requirements.
5. The Metering Pricing Scenarios v4.1 workbook was used to determine the adjustment amount related to Meters when working out the Network Services figures.

Methodology and Assumptions

In this section we explain the methodology Essential Energy applied to provide the required information, including any assumptions Essential Energy made.

Main assumptions are:

- FAR splits at 30 June 2014 are representative of the RAB asset splits for assets requiring disaggregation.
- The calculated regulatory period end adjustments to capex, i.e. the difference between actual and forecast net capex and the return on difference of net capex have been included in the RAB addition amounts.
- Any Emergency Spares, WIP, equity raising costs, deferred depreciation and RAB adjustments have been treated as Other assets with long lives. This provided the simplest means of reconciling back to the RFM.
- Movement of Metering assets from the Meter category when calculating the Network Services amounts does not impact on the estimated service life of new Meter assets or the estimated residual service life of Meter assets.
- The 2014 closing RAB values are the forecast results *before* the movement of Metering type 5&6 assets to Alternative Control, i.e. the 2014 closing Standard Control value will not match the 2015 opening Standard Control value without also adding in the 2015 opening Alternative Control RAB forecast.
- Capex spend for 2014 has been assumed to have occurred evenly throughout the year in terms of calculating asset lives, i.e. 2014 additions have a remaining useful life equal to the estimated service life of new assets less half a year.

Scope of services

Standard Control and Alternative Control numbers

Up to the end of the 2014 financial year, all of EE's RAB is related to Standard Control. There is no Alternative Control RAB. As a result, there are 0s entered for all of the Alternative Control cells.

Approach for deriving Network Services numbers

As specified in section 9 of the AER Economic Benchmarking Instructions and Definitions for Essential Energy, Metering services **do** form part of the Standard Control data, but *have been excluded from the Network Services* numbers. Fee based and quoted services costs are already excluded from Essential Energy's RAB values, therefore no adjustment was required for these costs in establishing the Network Services numbers.

In establishing the adjustment to be made for Metering, the opening RAB values for Meters, Other has been taken from the 2009-13 workings. The percentages derived in calculating the 2013/14 metering RAB for the SRP have been used to apportion the 2014 values. This equates to 84% of the previous AER asset category "Customer metering and load control" and 1.4% of total non-system assets. The Meters, Other asset items with long lives and Other asset items with short lives compilation rows have been reduced by these percentages as follows:

Meters

- All RAB values were reduced by 16% to extract the 84% related to metering.

Other long life assets

- The opening RAB value was rolled forward from the closing 2013 value.
- The closing RAB value was worked out from the Metering Pricing Scenarios v4.1 model (see the RFM page – sum of RAB adj, deferred depreciation, emergency spares and 98.6% of each of FF&E, Buildings, Land, Other non-system assets and Equity raising costs).
- The Standard Control components for inflation addition, straight line depreciation and disposals related to FF&E, Land, Buildings and Other non-system assets per the RFM were reduced by 1.4%.
- Additions were then calculated as the adjustment figure. NB. This is because of the slight change in the non-system percentage related to metering assets (previous years were based on 1.7%, thus, the opening RAB is slightly understated).

Other short life assets

- The opening RAB value was rolled forward from the closing 2013 value.
- The closing RAB value was worked out from the Metering Pricing Scenarios v4.1 model (see the RFM page – sum of Communications and 98.6% of each of IT and Motor Vehicles).
- The Standard Control components for inflation, straight line depreciation, and disposals related to IT and Motor vehicles per the RFM were reduced by 1.4%.
- Additions were then calculated as the adjustment figure. NB. This is because of the slight change in the non-system percentage related to

metering assets (previous years were based on 1.7%, thus, the opening RAB is slightly understated).

The resulting implied closing RAB value for metering assets was then checked to the Metering Pricing Scenarios model to ensure the values were consistent.

Table 3.3.1 Regulatory asset base values

This table is a summation of the asset data contained in Table 3.3.2 Asset value roll forward.

There are no reconciling items.

Table 3.3.2 Asset value roll forward

As for the 2009-13 data, some RAB financial information was able to be directly allocated to a group of RAB assets – these classes are summarised below. For these assets, the amounts from the RAB tables in the RFM were used to complete the data tables. These were completed after the 2014 capex additions, disposals and capital contributions amounts from the Annual Regulatory Accounts were linked to 2014 in the RFM. More data on how the additions were calculated is contained in the section below under the heading ADDITIONS.

Table 3.3.1 RAB categories that have been directly apportioned

OLD RAB category	New RAB category	Assumptions
Customer metering and Load Control	Meters	Assumed load control is part of Meters category
Communications	Other assets with short lives	
Land	Other assets with long lives	
Easements	Easements	
Emergency spares	Other assets with long lives	Assumed to be a long life asset as standard life is >10 years*
Work in progress	Other assets with long lives	Assumed to be a long life asset as standard life is >10 years* Have not apportioned WIP as is a simpler method and avoids reconciling amounts.
IT systems	Other assets with short lives	
Furniture, fittings, plant & equipment	Other assets with long lives	Assumed to be a long life asset as standard life is >10 years*
Motor vehicles	Other assets with short lives	Assumed to be a short life asset as standard life is <10 years*
Buildings	Other assets with long lives	
Land	Other assets with long lives	Land is assumed to not depreciate
Other non-system assets	Other assets with long lives	Assumed to be a long life asset as standard life is >10 years*

OLD RAB category	New RAB category	Assumptions
RAB adjustments		Assumed to be a long life asset as standard life is >10 years* Have not apportioned adjustments as is a simpler method and avoids reconciling amounts.
Deferred depreciation		Assumed to be a long life asset as standard life is >10 years* Have not apportioned deferred depreciation as is a simpler method and avoids reconciling amounts.
Equity raising costs		Assumed to be a long life asset as standard life is >10 years* Have not apportioned equity raising costs as is a simpler method and avoids reconciling amounts.

* In line with section 9 of the AER Economic Benchmarking Instructions and Definitions for Essential Energy.

Table 3.3.2 RAB categories that required disaggregation

Old RAB categories	New AER categories
Low voltage lines and cables Distribution lines and cables Sub transmission lines and cables	Overhead network assets <33kV Underground network assets <33kV Overhead network assets 33kV and above Underground network assets 33kV and above
Substations Transformers Land related to Substations	Distribution substations including transformers Zone substations including transformers

Disaggregating the RAB values for these items

A breakdown of the System Assets Fixed Asset Register by asset class as at 30 June 2014 was obtained. As in the previous year, this allowed the existing asset classes to be mapped to the new RAB categories.

Similarly to the development of the prior year data, the depreciated replacement cost by new RAB category could be determined using the ratios to establish the proportion by which the old RAB categories in the RFMs required splitting to “extract” the new RAB category breakdown. These rates, summarised in the Pivot of FAR 2014” sheet, have been used to determine the 2014 RAB amounts for the categories requiring disaggregation.

OPENING VALUE

- The 2014 opening RAB values were rolled forwards from the 2013 closing values.

INFLATION ADDITIONS

- As described above, the ratios summarised in the "Pivot of FAR 2014" sheet were used to split the relevant inflation addition amounts in the RFM into the new RAB categories.

STRAIGHT LINE DEPRECIATION

- Once again, the ratios have been used to split the relevant straight line depreciation amounts in the RFMs into the new RAB categories.

REGULATORY DEPRECIATION

- The sum of the inflation addition and the straight line depreciation equals the regulatory depreciation.

ADDITIONS

- Additions data for *system assets* was sourced from regulatory capex working papers. These workpapers have the annual system capex broken down into project types and each project type has been aligned to a new RAB category as in the 2009-13 years. This allows additions to be restated under these new categories. The additions workings are contained in the workbook "GLOBAL CAPEX model May 2014 v0.1.xlsx" on the sheet called "INPUT – CURRENT PERIOD".
- The numbers in the GLOBAL CAPEX file are net of customer contributions.
- The additions data for the *non-system* categories were sourced from the relevant RFM.
- The resulting dollars by asset category were then inflated by (1+ vanilla5 WACC rate)^0.5 as per the RFM models.
- These base figures have been adjusted by any associated amounts related to the Difference between actual and forecast net capex and the Return on difference in net capex.
- The additions numbers are *net* of customer contributions.

DISPOSALS

- The ratios have been used to split any disposals on the Input pages in the RFMs. All disposal values have been multiplied by (1+ vanilla5 WACC rate)^0.5 as per the RFM models.

CLOSING RAB VALUE

Once all the above items had been established the closing forecast 2014 RAB value could be easily calculated. The calculated closing RAB values were cross checked to the relevant closing RAB values in the RFM to ensure accuracy.

CAP CONS

The RAB additions noted in the category tables are exclusive of capital contributions. However, Essential Energy has received capital contributions and, as requested, the 2014 amount has been reported accordingly. The value has been taken directly from the RFMs.

Table 3.3.3 Total disaggregated RAB asset values

This table is a direct feed of the average opening and closing RAB values by asset category derived in Table 3.3.2.

Table 3.3.4.1 Asset Lives – estimated service life of new assets

The standard life of assets remains unchanged. This is consistent with the Input pages of both RFMs. The 2014 standard lives equal the 2013 standard lives.

Table 3.3.4.2 Asset Lives – estimated residual service life

For the disaggregated asset categories and Meters:

- The 2013 pivot table of average asset age and depreciated replacement costs by RIN category (based on sheet "7. Asset Installation" in the 2013 Annual RIN) was copied into a new sheet. Sheet 7 is no longer included in the Annual RIN.
- The average age of each asset type was reduced by one year to "roll forward" the asset age to 2014.
- The depreciated replacement cost was then similarly reduced by the decrease in asset age.
- A new line was added to each category for the 2014 asset additions.
- The relevant estimated service life for new assets from Table 3.3.4.1 was taken as the new addition's useful life. This amount was reduced by half a year as it is assumed that capex spend occurred evenly throughout the year. This figure became representative of the new addition's average age at the end of 2014.
- The additions amounts from Table 3.3.2 were taken as the new capex spend for the year. This amount was then reduced by dividing it by the relevant estimated service life for new assets and multiplying it by the average asset age calculated above, i.e. the capex amount was reduced by half a year of asset life.
- The weighted average asset age for each category could then be calculated.
- The estimated residual service life for each category was then calculated by taking the estimated service life of new assets and subtracting the average asset age as calculated above.
- An assumption has been made that the estimated residual service life of assets in the Meters category for the Network Services columns is the same as for the Standard Control Services columns, i.e. the movement of Metering assets from the previous Metering & Load Control category does not change the overall residual service life of the remaining assets.
- Whilst substation land is included in the RAB values for Substations, it has been assumed to have an indefinite life. As such, it has not formed part of the residual life calculations.

For Other long life assets and Other short life assets:

- The proportionate opening RAB values and additions amounts for each asset class were taken from the RFM. This allowed implied proportions to be established for the carried forward amount and additions amounts. These proportions were then multiplied by the 2013 carried forward residual life (rolled forward a year) and the standard asset life to give an estimated residual life for each asset class.
- The proportion of each asset class to the implied closing RAB was then used to calculate a weighted average life for the entire asset group.

NB. This calculation has changed since the initial Economic Benchmarking calculations which were done on NET additions, i.e. including disposals, and were therefore understating the residual life of

the asset class as less “new” assets were being included in the calculation. The adjustments are immaterial on an overall level.

Use of estimated information

As described above, all 2014 RAB information is estimated.
Given that the RAB rolls forward from year to year, as soon as one year contains estimated data, the following year necessarily contains estimates.

There was no other source of data available for this RAB exercise other than what was utilised.

The assumptions made for each row are included in the section above.

Material accounting policy changes

Essential Energy has not undertaken any material changes in accounting policies.

Reliability of information

Essential Energy considers the data on the *3.3. Assets (RAB)* sheet to be unreliable. This is due to the number of estimates in the data and the various assumptions that had to be made to extract this data to the level required.

In addition, based on an SKM valuation undertaken as at 30 June 2007, Essential Energy’s RAB values are significantly lower than what its assets are actually worth.

As a result of all these factors, Essential Energy considers the RAB values to be a very unreliable measure if used in any benchmarking comparisons.

Worksheet 3.4 – Operational Data

3.4.1 Total energy delivered

Compliance with requirements of the notice

This section contains the total energy delivered by Essential Energy to the customer based on the customer's metered consumption as per their invoice and relevant financial year.

Source of information

Total energy delivered has been sourced from the Finance Gross Margin report and includes Accruals. The Weighted Average Price Cap (WAPC) for 2013-14 is not available due to invoice data not being finalised for the period until at least March 2015. The Finance report takes into account the invoice data that is still outstanding through the accrual process.

Methodology and Assumptions

Table 3.4.1 shows total energy delivered as reported in the Finance Gross Margin report and includes Accruals. Data for the 2013-14 year has not been audited.

The Finance Gross Margin report including Accruals is provided by Finance as part of the end of year Board report and is subject to statutory audit.

Table 3.4.1

Variable Code	Variable	Tariffs included
DOPED01	Total energy delivered	Sum of single and ToU consumption for all tariffs **(Links refer to 'FY14 GM Result')**

Use of estimated information

The accrual process is an estimate of outstanding invoices for the period , however this is as provided to the Board and audited so is considered reliable.

Material accounting policy changes

n/a

Reliability of information

The data provided in this table is considered to be reliable.

3.4.1.1 Energy grouping - delivery by chargeable quantity

Compliance with requirements of the notice

This section contains the total energy delivered by Essential Energy to the customer based on the customer's metered consumption as per their invoice and relevant financial year.

Source of information

Total energy delivered has been sourced from the Finance Gross Margin report and includes Accruals. The Weighted Average Price Cap (WAPC) for 2013-14 is not available due to invoice data not being finalised for the period until at least March 2015. The Finance report takes into account the invoice data that is still outstanding through the accrual process.

Data for the 2013-14 year has not been audited to date.

Methodology and Assumptions

Data provided in Table 3.4.1, DOPED01, was sourced from the Finance Gross Margin report and includes Accruals.

The Finance Gross Margin report including Accruals is provided by Finance as part of the end of year Board report and is subject to statutory audit.

The Finance Gross Margin report provides the Distribution consumption at a segment level.

Peak, shoulder and off- peak periods relate to Essential Energy's own charging periods and are not split out in the Finance Gross Margin report, therefore have been prorated on the 2013-14 years split. History shows there is minimal movement between previous years.

Table 3.4.2

	2011	2012	2013
Energy Delivery at On-peak times	16.1%	16.0%	16.0%
Energy Delivery at Shoulder times	34.3%	33.7%	33.3%
Energy Delivery at Off-peak times	49.6%	50.3%	50.7%

The table below shows how data has been aggregated from the Finance Gross Margin report into the RIN template.

Table 3.4.3

Variable Code	Variable	Segments included
DOPED0201	Energy Delivery where time of use is not a determinant	Residential Continuous and Business Continuous
DOPED0202	Energy Delivery at On-peak times	Residential TOU, Business TOU <100 MWH, Business TOU >100 MWH, Low Voltage Demand, Industrial (incls High Voltage, Subtransmission, Site Specific, Inter Distributor Transfers) – Prorated based on 2012/13 split
DOPED0203	Energy Delivery at Shoulder times	Residential TOU, Business TOU <100 MWH, Business TOU >100 MWH, Low Voltage Demand, Industrial (incls High Voltage, Subtransmission, Site Specific, Inter Distributor Transfers) – Prorated based on 2012/13 split

DOPED0204	Energy Delivery at Off-peak times	Residential TOU, Business TOU <100 MWH, Business TOU >100 MWH, Low Voltage Demand, Industrial (incls High Voltage, Subtransmission, Site Specific, Inter Distributor Transfers) – Prorated based on 2012/13 split
DOPED0205	Controlled load energy deliveries	Controlled Load 1 and Controlled Load 2
DOPED0206	Energy Delivery to unmetered supplies	Streetlighting

Use of estimated information

The accrual process is an estimate of outstanding invoices for the period, however this is as provided to the Board and audited so is considered reliable.

Material accounting policy changes

n/a

Reliability of information

The data provided in this table is considered to be reliable.

3.4.1.2 Energy - received from TNSP and other DNSPs by time of receipt, and

3.4.1.3 Energy - received into DNSP system from embedded generation by time of receipt

Compliance with requirements of the notice

This section contains the total energy input into Essential Energy's network and as measured by the Bulk Supply points.

Source of information

Data has been sourced from an internal reporting system, EDDIS Cognos cube for 2013-14.

Methodology and Assumptions

Data was extracted from the Internal EDDIS Cognos cube report at a half hourly level and aggregated to total Bulk Supply point. This includes internal categories of BSP, cross border and TUOS pass through.

Based on the Essential Energy definition of Peak, Shoulder and Off Peak, as seen in table 3.4.4 below, the half hourly data was aggregated into Peak, Shoulder and Off Peak buckets in Excel to determine the totals to report in the table.

Table 3.4.1.2 is not total network load as the generation load has not been added back on.

Off peak readings in the spreadsheet exclude Public holidays and DST as this is how the majority of our small customers are billed, as detailed below.

Table 3.4.4 Essential Energy Time Periods

Peak	7am to 9am and 5pm to 8pm on weekdays
Shoulder	9am to 5pm and 8pm to 10pm on weekdays
Off Peak	all other times

The EDDIS Cognos cube also contains the embedded generation data and this was extracted along with the Bulk Supply point data and calculated in the same spreadsheet for Table 3.4.1.3.

Table 3.4.1.3 also includes residential embedded generation. This information is only available through the invoicing of customers and was derived through Finance SBR (Subsequent Billing Report) Accrual process, due to the WAPC tables not being available. Due to the impact of NSW and QLD solar bonus schemes and the significant increase in export GWh since its inception in 2010, the solar units are required to provide total purchase units.

Use of estimated information

All information for these tables was based off actual metered information from the EDDIS Cognos cube at the time of extraction.

Material accounting policy changes

n/a

Reliability of information

The data provided is considered reliable.

3.4.1.4 Energy grouping - customer type or class

Compliance with requirements of the notice

This section contains the total energy delivered by Essential Energy to the customer based on the customer's metered consumption as per their invoice and relevant financial year.

Source of information

Total energy delivered has been sourced from the Finance Gross Margin report and includes Accruals. The Weighted Average Price Cap (WAPC) for 2013-14 is not available due to the invoice data not being finalised for the period until at least March 2015. The Finance report takes into account the invoice data that is still outstanding through the accrual process.

Methodology and Assumptions

Data provided in Table 3.4.1.1 was sourced from the Finance Gross Margin report and includes Accruals.

The Finance Gross Margin report including Accruals is provided by Finance as part of the end of year Board report and is subject to statutory audit.

The Finance Gross Margin report provides the Distribution consumption at a segment level.

The table below (3.4.5) shows how data has been aggregated from the Finance Gross Margin report into the RIN template.

Table 3.4.5

Variable Code	Variable	Segments included
DOPED0501	Residential customers energy deliveries	Sum of all Residential tariffs including Controlled load tariffs
DOPED0502	Non-residential customers not on demand tariffs energy deliveries	Business Continuous, Business TOU <100 MWH, Business TOU >100 MWH, Low Voltage Demand, Streetlighting
DOPED0503	Non-residential low voltage demand tariff customers energy deliveries	Low Voltage Demand
DOPED0504	Non-residential high voltage demand tariff customers energy deliveries	Industrial (incls High Voltage, Subtransmission, Site Specific, Inter Distributor Transfers)
DOPED0505	Other Customer Class Energy Deliveries	n/a

Use of estimated information

The accrual process is an estimate of outstanding invoices for the period , however this is as provided to the Board and audited so is considered reliable.

Material accounting policy changes

n/a

Reliability of information

The data provided in this table is considered to be reliable.

3.4.2.1 Distribution customer numbers by customer type or class

Compliance with requirements of the notice

This section contains the average number of customers by required grouping. The average was determined by calculating the average of the numbers at the start of the regulatory period and the end of the regulatory period, as requested in the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER. This is different to Essential Energy's process which determines total billed days for the financial year and divides by the days in the year.

Note that there are no unmetered connections in Essential Energy's data that has not been reported in the customer numbers. It appears that none of Essential Energy's unmetered customers have a National Meter Identifier (NMI) for them to be excluded in the total count.

Source of information

Data has been sourced from an internal reporting system and existing query, Cognos - tariff count, which extracts data from the billing system Energy/Peace.

Methodology and Assumptions

The Tariff count query provides the number of connected premises by tariff class, month and financial year.

In order to determine the tariff class required to be reported the spreadsheet was linked to the internal Annaj tables which determines Network Description and relevant grouping.

Certain criteria and exclusions are required to ensure the correct categories are met. These are:

- All export tariffs are removed
- All zero network code tariffs are removed as these are pre-existing retail customers
- Gas tariffs are removed, network code 500+
- Tariff 23000 is removed as this is a Remote Metering Fee
- Only Anytime and Peak Energy tariffs are included as these are the primary tariffs and will not result in duplicate premises being counted.

The following table (3.4.6) shows the internal groupings aligned with requested Customer type in Table 3.4.2.1.

Table 3.4.6

Internal Groupings	**Requested Customer Type**
HV Demand	High voltage demand tariff customer numbers
LV Business continuous	Non-residential customers not on demand tariff customer numbers
LV Controlled Load 1	Excluded
LV Controlled Load 2	Excluded
LV Demand	Low voltage demand tariff customer numbers
LV Residential Continuous	Residential customer numbers
LV Residential TOU	Residential customer numbers
LV TOU over 100 MWh/yr	Non-residential customers not on demand tariff customer numbers
LV TOU under 100 MWh/yr	Non-residential customers not on demand tariff customer numbers
Site Specific	High voltage demand tariff customer numbers
Sub transmission	High voltage demand tariff customer numbers

A count is determined for the first month of the regulatory year and also for the last month of the regulatory year to then calculate the average number of Distribution Customers as per the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER.

The above count has then been used to pro rata the total for each year as provided in Table 3.4.2.3 into the requested variables.

Unmetered customers have been extracted from the Energy/Peace system through Cognos.

The guidance also required de-energised customer numbers. Unfortunately these numbers are not accounted for in this report. The de-energised numbers have been provided through another system PowerOn Fusion. These numbers have been included in the table under the header 'Other Customer Numbers' (DOPCN0106).

Use of estimated information

All information for this table was based off information from the billing system, Energy.

Material accounting policy changes

Essential Energy has not undertaken any material changes in accounting policies.

Reliability of information

These reports were set up solely for the ability to report for Table 3.4.2.1.

The information provided in these tables is based on assumptions and estimates and caution should be used when using it for benchmarking or decision making purposes.

3.4.2.2 Distribution customer numbers by location on the network

Compliance with requirements of the notice

Essential Energy has reported customer numbers in accordance with the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER.

Source of information

Data has been 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). To that information has been added the unmetered account information which came from Table 3.4.2.1 (DOPCN0105)

Methodology and Assumptions

The data has been collected and collated in line with the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER. The unmetered account numbers have been obtained from Table 3.4.2.1 (DOPCN0105) and added onto the total number of customers for each year (DOPCN02). They have then been prorated across the feeder classes (DOPCN0202, DOPCN0203 & DOPCN0204).

Customers are attached to distribution substations in PowerOn Fusion. This data is updated nightly from Peace. Essential Energy has a trace that pulls back the customer numbers from each distribution substation and also the network connectivity. This links

the distribution substations to a feeder segment and then to a distribution feeder. Feeders are categorised based on the guidance issued by the AER.

A count is determined at the start of the regulatory year and also at the end of the regulatory year to then calculate the average number of Distribution Customers as per the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER.

The spreadsheet used to collate data is named: “AP&R - economic RIN data file v2”.

Use of estimated information

All information for this table was based off information from the billing system, Energy.

Material accounting policy changes

Essential Energy has not undertaken any material changes in accounting policies.

Reliability of information

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

3.4.2.4 Unmetered Supply

Compliance with requirements of the notice

There are no unmetered connections in Essential Energy's data that has not been reported in the customer numbers. It appears that none of Essential Energy’s unmetered customers have a National Meter Identifier (NMI) for them to be excluded in the total count.

Source of information

Data has been sourced from an internal reporting system and existing query, Cognos - tariff count, which extracts data from the billing system Energy/Peace.

Methodology and Assumptions

Unmetered customers have been extracted from the Energy/Peace system through Cognos, as per Table 3.4.2.1.

Use of estimated information

All information for this table was based off information from the billing system, Energy.

Material accounting policy changes

Essential Energy has not undertaken any material changes in accounting policies.

Reliability of information

These reports were set up solely for the ability to report for Table 3.4.2.1.

The information provided in these tables is based on assumptions and estimates and caution should be used when using it for benchmarking or decision making purposes.

3.4.3 System Demand, and

3.4.3.1 – 3.4.3.5 System Demand

Compliance with requirements of the notice

The AER nominate time periods that are based on financial years. However, the Essential Energy definition differs from the AER definition. An example of how Essential Energy defines a time period is that 2008-09 includes the summer period of 2008-09 and the winter period of 2009 (say from October 2008 to September 2009). For forecasting purposes the AER definition does not work and should be disregarded. A practical example of why it does not work is that a system peak occurred on 19 July 2011 but the next system peak occurred on 18 January 2013. Clearly the dates meet the financial year requirement, i.e. 2011-12 and 2012-13, however from a seasonal perspective, they miss the periods of summer 2011-12 and winter 2012. Clearly it would be negligent of an organisation or individual not to consider all seasonal data in forecasting.

The AER definition of a zone substation is “a substation on a distribution network that transforms any voltage above 33kV to levels at or below 33kV but above 1kV”. Only forecast demands from zone substations that meet the AER definition have been included.

Source of information

The vast majority of historical zone substation demand data is sourced from demand meters (via IMDR) and from SCADA (via TrendSCADA). Of the small remainder of zone substations, the vast majority of information is sourced directly from data stored on individual reclosers with only a handful of zone substations having maximum demand indicators or no data recording devices whatsoever. Those individual zone substation demands are shown in Table 5.4 of the Category Analysis RIN.

For DOPSD0107 and DOPSD0207, the transmission connection point data was obtained from demand meters.

Methodology and Assumptions

Essential Energy does not use weather adjusted demands. Therefore all values provided in the table are not weather adjusted.

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

- **DOPSD0101 and DOPSD0201** – in Table 3.4.3 have been calculated from Table 5.4 of the Category Analysis RIN.
- **DOPSD0107 -** sourced from raw data obtained from transmission connection points.
- **DOPSD0207 and DOPSD0210** – have been calculated based on the average network power factor over the last ten years.

- **DOPSD0110** – the Coincident Raw System Annual Maximum Demand has been sourced from the Annual Regulatory Accounts and from raw data obtained from transmission connection points.

- **For DOPSD0104 and DOPSD0204** – in Table 3.4.3 have been calculated from Table 5.4 of the Category Analysis RIN.

- **For DOPSD0301** – is calculated from DOPSD0104 and DOPSD0204.

- **DOPSD0302-DOPSD0311** – have been calculated based on historical power factors for each network voltage level.

Use of estimated information

Where data has not been recorded, historical data is used to estimate the expected loads and power factors seen for the current year.

Material accounting policy changes

n/a

Reliability of information

As per the methodology and assumptions section above.

3.4.3.6 – 3.4.3.7 Demand supplied (for customers charged on this basis) – MW & MVA measure

Compliance with requirements of the notice

This section contains the total energy delivered by Essential Energy to the customer based on the customer's metered consumption as per their invoice.

Source of information

Data has been sourced from the billing system as per what was invoiced to the relevant customer.

Methodology and Assumptions

All data provided came from Invoice data from the Billing system.

The tables below (3.4.7 and 3.4.8) show how the data has been aggregated into the RIN templates.

Table 3.4.7

Variable Code	Variable	Tariffs included
DOPSD0401	Summated Chargeable Contracted Maximum Demand MW	Essential Energy does not have contracted Demand
DOPSD0402	Summated Chargeable Measured Maximum Demand MW	Sum of the Demand billed in MW for all CRNP tariffs

Table 3.4.8

Variable Code	Variable	Tariffs included
DOPSD0403	Summated Chargeable Contracted Maximum Demand MVA	Essential Energy does not have contracted Demand, however Essential Energy do have Capacity Biller tariffs which are based on the Max KVA for the prior 12 months, these tariffs are recorded here.
DOPSD0404	Summated Chargeable Measured Maximum Demand MVA	Sum of the Demand billed in MVA for all relevant Demand tariffs

Use of estimated information

All information for this table was based off actual invoiced information.

Material accounting policy changes

n/a

Reliability of information

The data provided in this table is considered to be reliable.

Worksheet 3.5 – Physical Assets

3.5.1.1 – 3.5.1.2 Overhead and underground network length of circuit at each voltage

Compliance with requirements of the notice

The Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER requires the circuit length of every in service overhead and underground sub transmission and distribution circuit to be determined for the 2013-14 financial year. For Tables 3.5.1.1 and 3.5.1.2, this 'circuit length' has been determined by considering each circuit (regardless of voltage) as a separate entity. This is different to route length used in Table 8.3, which, in effect, disregards the number of circuits that span between two poles. The file 'Route length examples.jpg' demonstrates the difference between circuit length (used for these tables) and route length (used for Table 8.3).

Final connections to the mains have been excluded (i.e. overhead service lines and underground service cables), as well as overhead lines and underground cables for public street lighting.

Source of information

Overhead line & underground cable data (ie 'Cables') were exported from the GE Smallworld GIS using FME and saved as MapInfo files.

Methodology and Assumptions

The MapInfo files were then analysed using FME. The FME Workbench filtered out all cables that were not owned by Essential Energy & Service Status was ignored. Any LV cables that had an LV Service Type of 'Service' were considered as Service; any that had an LV Service Type of 'Consumer Mains' or Sub-mains' were ignored. The Nominal Length attribute on the cable was used for the length of each cable. The results were then summarised.

The Category ANalysis RIN definition of 'Route Line Length' & 'Circuit Line Length' specifically says not to include service lines, therefore overhead and underground service lines has been excluded.

Figures obtained from the GIS are assumed to be 'actual', even though it is acknowledged that the data may have been incomplete or duplicated.

Although services are excluded, it is worth noting here that a service that goes to a premise is not shown going to the premise, but to a Service Point object instead (a Service Point is an object that approximately marks the location of one or more premises). In urban areas, Service Points are generally drawn centred and six metres in from the front boundary of the land parcel, and is therefore not the actual point of attachment of the service. Consequently, reporting the length of services is not accurate.

Use of estimated information

Material accounting policy changes

Essential Energy has not undertaken any material changes in accounting policies.

Reliability of information

The data that has been used for the quantities in Tables 6.1.1 and 6.1.2 has primarily come from Essential Energy's GIS, GE Smallworld systems. The accuracy of the information presented in the tables was directly affected by the accuracy of the data in the GIS at the time. Contributing factors to accuracy are listed below.

Data Quality:
The quality of the cable information stored in the GIS has been steadily increasing over many years, however the following points describe some of the known data quality issues:

- Data quality checks regularly highlight data quality issues, however certain issues cannot be resolved without field visits, which in many cases are not warranted due to the nature of the issue and the distance needed to be travelled;
- There is further work to do to identify LV that has been incorrectly called LV service, particularly with underground. This may significantly increase the length of LV mains & decrease the length of LV services;
- There is further work to do to capture services that go from the LV mains to the Smallworld Service Point;
- Some underground cables may be missing or drawn in the incorrect location, and may not be detected because it is difficult to know exactly where they are.

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

3.5.1.3 – 3.5.1.4 Estimated overhead and underground network weighted average MVA capacity by voltage class

Compliance with requirements of the notice

Essential Energy has provided estimated typical or weighted average capacities for each of the listed voltage classes under normal circumstances taking account of limits imposed by thermal or by voltage drop considerations as relevant. Further detail has been provided in the subsequent subheadings to address compliance requirements.

Source of information

Essential Energy's information regarding Tables 3.5.1.3 and 3.5.1.4 was obtained from the following sources;

- Smallworld – Specifically for Tables 3.5.1.3 and 3.5.1.4 data was sourced on;
    - feeder lengths
    - feeder phase lengths (i.e. single phase, three phase or SWER)
    - feeder linkages to fault level information
    - feeder first segment conductor type
    - feeder underground and overhead lengths
    - feeder voltage
- Sincal -– Specifically for Tables 3.5.1.3 and 3.5.1.4 data was sourced on;
    - fault levels
- CE Subtransmission Feeder Ratings Version U Draft.xlsx – Specifically for Tables 3.5.1.3 and 3.5.1.4 data was sourced on;

    - feeder section lengths
    - feeder section ratings
    - underground and overhead lengths
    - feeder voltage
- Operational Manual: Standard Overhead Conductor: Current Rating Guide CEOM7011– Specifically for Tables 3.5.1.3 and 3.5.1.4 data was sourced on;
    - Conductor and Cable ratings
- Tables 3.5.2.1 and 3.5.2.2 of Essential Energy's Economic Benchmarking RIN (Distribution transformer total installed capacity and Zone substation transformer capacity)

Methodology and Assumptions

Background:
It should be noted that, as the outcome of this table is a km capacity, the methods used below determine the capacity of the line with respect to the line only.
Example; A feeder is connected to a Zone Substation breaker with a rating of 100A, the feeder is made up of 3 segments, 2 segments with a thermal capacity of 200A, 10km in total, 1 segment with a thermal capacity of 150A 5km in total. There are no voltage constraints on the feeder capacity.

Under the weighted average capacity methodology the feeder capacity is calculated as;

(200 x 10 + 150 x 5) / 15 = 183A, even though the surrounding infrastructure is not capable of supplying this level of current.

Methodology Part 1;
For the subtransmission network relatively accurate information is held on feeder sections which includes;

- Region
- Area
- Feeder Number
- From Sub/Tee
- Section Number
- To Sub/Tee
- Operating Voltage (kV)
- Is this the Minimum conductor on the feeder section?
- Summer Day Rating
- Winter Day Rating
- Summer Day Emergency Rating (1.0 m/s wind)
- Winter Day Emergency Rating (1.0 m/s wind)
- Wind and Ambient Temperature Condition
- Alias in ENMAC
- Conductor
- Design Temperature of Line Section (degrees C)
- Section Length (km)
- Construction Type
- Configuration
- Year Line Section Constructed
- OHEW type
- OHEW Dist (km)
- Summer Ambient Temp C
- Winter Ambient Temp C
- Summer Wind Average (m/s)

- Winter Wind Average (m/s)
- Summer Day (A)
- Winter Day (A)
- Summer Day (MVA)
- Winter Day (MVA)
- Diam (mm)
- Rdc 20C (ohm/km)
- 0C k (m Rac/Rdc)
- Coeffic dc resist
- Summer Day (A)
- Winter Day (A)
- Summer Day (MVA)
- Winter Day (MVA)

Derivation of ratings for Subtransmission Feeders

- Overhead conductor ratings are calculated using formulas defined in ESAA D(b)5-1988.
- Underground cable ratings are defined by the cable manufacturer.

Assumptions under Methodology Part 1;

- All subtransmission feeders are to be treated as summer constrained and therefore summer ratings have been used, as the minority of winter constrained feeders will have an insignificant effect on the results.
- All subtransmission feeders are to be treated as thermally constrained, as the minority of voltage constrained subtransmission feeders will have an insignificant effect on the results.
- Some subtransmission feeder section ratings or lengths were unavailable and hence were not used in the calculations, it has been assumed that the minority of feeders with missing data will not have a significant effect on the results

Methodology Part 2;

Relatively poor information is kept on HV feeders and their ratings, particularly when considering the non-uniform rating of HV feeders along their length. For the derivation of the “weighted average MVA capacity” on HV feeders for a given voltage the following data was obtained;

- the maximum fault level along the feeder has been taken from Sincal simulations
- the minimum fault level along the feeder has been taken from Sincal simulations
- the length of the three phase, single phase, and SWER feeder sections for both overhead and underground have been obtained from Smallworld
- the first conductor in the feeder has been taken from Smallworld

Derivation of ratings

The following calculations were performed on the forementioned data to determine the rating of each feeder;

- Averaging the minimum and maximum fault levels, to determine the average fault level along the feeder (as an alternative to determining the fault level along every finite section of the HV feeder)
- Taking the voltage based rating for all available HV feeders as 10% of the averaged fault current (if a single phase to earth fault results in a voltage of zero at the location of the fault, 10% of the single phase to earth fault will result in a

10% reduction in voltage – a 10% reduction in voltage being approximately the limit for HV feeders)
- Taking the thermal rating for all available HV feeders as the rating of the first conductor out of the substation based on the conductor type and a 50 degree Celsius rating
- Taking the voltage based rating for all available SWER sections as 10% of the averaged fault current on the SWER section (if a single phase to earth fault results in a voltage of zero at the location of the fault, 10% of the single phase to earth fault will result in a 10% reduction in voltage – a 10% reduction in voltage being approximately the limit for HV feeders)
- Taking the actual rating for the feeder as the minimum of the thermally based rating and the voltage based rating

Assumptions under Methodology Part 2;
- The fault current is a reasonable surrogate for determining maximum current based on voltage, however large variations in the X/R ratio of the fault away from unity will see true current carrying capacity vary according to the power factor of the load.
- HV feeders have a linear reduction in fault level.
- All HV feeders have a 50 degree Celsius rating, whilst this is most likely not the case, Essential Energy believes it to be a reasonable assumption based on the limited data available.

Methodology Part 3;
LV Feeder ratings are virtually non-existent and many LV feeders will be voltage constrained, however a methodology to deliver the voltage based current capacity of all LV feeders in the given timeframe was not available.
LV Feeder ratings are hence based solely on the thermal rating of the conductors used.

Assumptions under Methodology Part 3;
- All LV feeders have a 50 degree Celsius rating, whilst this is most likely not the case, Essential Energy believes it to be a reasonable assumption based on the limited data available.
- The conductor information available is a reasonable sample of the available LV feeder stock.
- The conductors have been assumed to be three phase unless further information was available.

Methodology and Assumptions Part 4;
Calculation of “weighted average MVA capacity”
The “weighted average MVA capacity” for a given voltage is determined by assigning a weight to the rating of the feeder section based on the feeder section length divided by the total feeder length for each voltage class and construction type (overhead and underground).

“Weighted average MVA capacity” of the current year compared to previous years

The asset data used to construct the weighted average MVA capacity is highly variable due to the large amount of unknown conductors and ratings within Essential Energy’s network and the process of continual data improvement. Variations in fault data and asset data may have large impacts on the weighted average MVA capacity, in most cases this error in data will have substantially greater impact than the sum of the

network upgrades during the year in question, i.e. the percentage error is considered to be greater than the actual change in value being measured.

Use of estimated information

Almost all data involved in the “weighted average MVA capacity” with the exception of feeder lengths can be considered to be estimated, these estimations include;

Subtransmission feeder ratings
While subtransmission feeder ratings are calculated based on known conductor types and widely used industry principles, the weather parameters used in those calculations are based on area wide assumptions and hence feeder ratings can be considered as best estimates.

HV feeder ratings
HV feeders do not have uniform ratings along their length for two main reasons; firstly HV feeders consist of different conductor types and phasing along their length and hence have different thermal ratings along their length, secondly HV feeders can have, and in Essential Energy’s network the majority will have, considerable voltage drop along the length of the feeder, hence even if maximum thermal rating could be delivered, it would not be at voltages required under our license conditions.

On the surface the most consistent method to estimate HV feeder ratings based on voltage constraints would be to scale the simulated loads along each feeder until a voltage constraint occurs and define the feeder rating as the current under those simulated conditions. This method however fails to deliver the installed “strength” or “capacity” of the network, as the results are skewed by the placement, original size and scaling of the simulated loads which may have small relative inaccuracies in the original modelling, but when multiplied can lead to large inaccuracies. Another issue with the use of this method is that it will not necessarily give a whole of feeder capacity; rather it will define the capacity of the feeder by the weakest link in the feeder, which may or may not have any influence on the actual capacity of the feeder depending on where any growth occurs.

The alternative method used by Essential Energy to formulate the HV feeder ratings as required by the RIN removes some of the reliance on the simulated loads, instead focusing largely on the installed “strength” or “capacity” of the network. This has been achieved by using the average fault level across the available HV feeders, removing any need to rescale loads, with the added benefit of being more easily repeated and with greater consistency. Note that the loading on the feeder is still a contributing factor to the fault level due to the effect on the starting voltage at the time of simulated fault.

This method of using fault current or short circuit current to determine network strength is used in Australian standards such as AS/NZS 61000.3.6:2001 in reference to permitted harmonic thresholds of particular electronic devices.

Material accounting policy changes

n/a

Reliability of information

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

3.5.2.1 Distribution transformer total installed capacity

Compliance with requirements of the notice

The information provided reports a breakdown of transformer capacity of distribution transformers owned by Essential Energy, high voltage customers, and spare transformers owned by Essential Energy that are not currently in use. This is in line with the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER.
Data for private HV transformer capacity was sourced from maximum demand records from the 2013-14 fiscal period.

Source of information

This data has been obtained from:

- Current Distribution Transformer MVA extracted from the WASP system as reported in Table 3.5.2.1 in the Economic Benchmarking RIN.
- The 2014-15 and 2015-16 programs maintained by the Distribution Planning Group.
- The data for HV customers has been sourced from metering data (linked to a National Metering Identifier) held by our Network Connections group.

Methodology and Assumptions

1. Determine the current Distribution Transformer Capacity values.
    a. This was determined as part of the Economic Benchmarking RIN. Refer to Table 6.2.1 of this Basis of Preparation document. The 2013-14 Financial Year values were used as base values.

2. Forecast MVA to be added for Distribution Transformers
    a. The program for planned distribution works in 2014-15 and 2015-16 and the budget for 2014-15 to 2018/19 was obtained.
    b. The program was reviewed for any projects involving Distribution Transformer replacements, upgrades or new planned works.
    c. The additional MVA added was determined for 2014-15 and 2015-16 and years 2016-17 to 2018-19 were determined by projecting forward the figures from 2014-15 and 2015-16 and aligning with budget levels from 2014-15 to 2018-19.

3. Accredited Service Provider (ASP) installations were forecasted based on previous growth trends.

4. The additional MVA from steps 2 and 3 were then added to the base values determined in step 1 to arrive at the final Distribution Transformer Capacities for each year for items DPA0501, DPA0502 and DPA0503.

5. Data for HV customers includes both HV demand (808.662 MVA) and generation (304.056 MVA) customers

- **DPA0501 – Distribution transformer capacity owned by utility including Cold Spares**

  SQL Logic:

  1. Distribution transformer capacity owned by utility (not including Cold Spares)
     - Only Substation Sites with an Owner = 'Essential Energy'
     - Only Substation Sites with a Service Status = 'In Service' (Out of Service have been classified as Cold Spares)
     - Excludes Substation Sites with a Substation Type = 'Isolator' or 'Step Up/Down' (this leaves all Distribution Substation Sites)
     - Excludes Substation Sites with a SWER Primary Votage (6.35kV, 12.7kv, 19.1kV), therefore excluding SWER Isolators in conjunction with the above item.
     - 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
     - MVA was calculated as kVA (derived if necessary as per above)/1000 and summed for each year.
     - 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).
       - if Transformer 'Date Manufactured' is not available then it was classified as <1950

  2. Cold Spares (added to item (1) once determined)
     - All Substations Sites with an Owner = 'Essential Energy' and a Service Status = 'Out of Service'
       plus
       All Transformers with a parent of the Transformer Store or the Contractor Evaluation

Store (these are transformers in stores waiting to be evaluated or waiting to be used in the network)

- For 'Out of Service Substation Sites', kVA has been obtained from the Substation Site's 'Total KVA'. If this is not available, then kVA has been derived as follows:
  - 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
- For Transformers in Stores, kVA has been obtained from the Transformer 'KVA'. If this is not available, then kVA has been estimated to be 63kVA.
- Excludes Substation Sites with a Substation Type = 'Isolator' or 'Step Up/Down' (this leaves all Distribution Substation Sites)
- Excludes Substation Sites and Transformers with a SWER Primary Votage (6.35kV, 12.7kv, 19.1kV), therefore excluding SWER Isolators in conjunction with the above item.
- MVA was calculated as kVA (derived if necessary as per above)/1000 and summed for each year.
- For 'Out of Service Substation Sites', the year has been obtained from the Substation Site's 'Date Constructed'. If this is not available, then Year has been derived as follows:
  - if Substation Site 'Date Constructed' is blank, then use most recent 'Date Manufactured' from the Substation Site's associated children Transformer(s).
  - if Transformer 'Date Manufactured' is not available then it was classified as <1950
- For Transformers in Stores, the year has been obtained from the Transformer 'Date Manufactured'. If this is not available, then the Year has been classified as <1950

- **DPA0502 – Distribution transformer capacity owned by High Voltage Customers**

  Data for private HV transformer capacity was sourced from maximum demand records from the 2013-14 fiscal period. The data has been sourced from metering data (linked to a National Metering Identifier) held by our Network Connections group.

  Data includes both HV demand (808.662 MVA) and generation (304.056 MVA) customers.

This value is estimated as it uses the maximum demand rather than the actual transformer capacity. As Essential Energy does not own the HV transformers, there is only very limited data on them (hence the use of the maximum demand value).

The maximum demand value should be reliable, however it is not an accurate representation of the private HV transformer capacity. It is expected that the actual capacity would be at least 20% higher than the maximum demand, and possibly much greater than this.

This is a different methodology to what has been provided previously so numbers may vary.

- **DPA0503 – Cold spare capacity included in DPA0501**

  SQL Logic:

  - All Substations Sites with an Owner = 'Essential Energy' and a Service Status = 'Out of Service'
    plus
    All Transformers with a parent of the Transformer Store or the Contractor Evaluation Store (these are transformers in stores waiting to be evaluated or waiting to be used in the network)
  - For 'Out of Service Substation Sites', kVA has been obtained from the Substation Site's 'Total KVA'. If this is not available, then kVA has been derived as follows:
    - 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
  - For Transformers in Stores, kVA has been obtained from the Transformer 'KVA'. If this is not available, then kVA has been estimated to be 63kVA.
  - MVA was calculated as kVA (derived if necessary as per above)/1000 and summed for each year.
  - For 'Out of Service Substation Sites', the year has been obtained from the Substation Site's 'Date Constructed'. If this is not available, then Year has been derived as follows:
    - if Substation Site 'Date Constructed' is blank, then use most recent 'Date Manufactured' from the Substation Site's associated children Transformer(s).
    - if Transformer 'Date Manufactured' is not available then it was classified as <1950
  - For Transformers in Stores, the year has been obtained from the most recent asset movement date for when the Transformer was moved into the 'Transformer' or 'Contractor Evaluation Store' if available. If this is not available, then the Year has been determined as follows:

- If no asset movement record into a relevant store, then use the Transformer 'Date Manufactured'.
- if Transformer 'Date Manufactured' is not available then it was classified as <1950

Use of estimated information

The base MVA figures use estimated information as detailed in this Basis of Preparation document for Table 3.5.2.

The added MVA figures are based on estimated future planned distribution transformer replacements/installations and will not take into account asset replacement due to unexpected failures or changes in funding allocations.

The value for HV customers is estimated as it uses the maximum demand rather than the actual transformer capacity. As Essential Energy does not own the HV transformers, there is only very limited data on them (hence the use of the maximum demand value).

Material accounting policy changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported in Table 3.5.2.1 over the period requested.

Reliability of information

These figures are based on estimated future planned distribution transformer replacements/installations and will not take into account asset replacement due to unexpected failures or changes in funding allocations. The base figures used for the distribution transformer capacity are dependent on the accuracy of the data within the WASP database as well as assumptions made as per this Basis of Preparation document for table 3.5.2.

3.5.2.2 Zone substation transformer capacity

Compliance with requirements of the notice

The information provided reports on the transformer capacity of distribution Zone substation transformers owned by Essential Energy. The data is broken down according to transformation steps as well as those that are not currently in use. This is in line with the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER. Further detail has been provided in the subsequent subheadings to address compliance requirements.

Source of information

This data has been obtained from:

- Current Zone Substation Transformer MVA extracted from the WASP system as reported in Table 3.5.2.2 in the Economic Benchmarking RIN.
- A list of Zone Substations Transformers planned for refurbishment/replacement due to asset condition/age, maintained by the Zone Substation Maintenance Group.

- A list of new Zone Substations planned or plans for the augmentation/upgrade of existing Zone Substations due to growth/capacity, maintained by the Subtransmisison Planning Group.

Methodology and Assumptions

1. Determine the current Zone Substation Transformer Capacity values.
    a. This was determined as part of the Economic Benchmarking RIN. Refer to this Basis of Preparation document for Table 6.2.2. The 2013 values were used as base values.

2. Forecast MVA to be added Zone Substation Transformers planned for refurbishment / replacement due to asset condition / age
    a. The PIP (Portfolio Investment Plan) was obtained which contains a list of Power Transformers planned for replacement or refurbishment due to asset condition or age.
    b. The PIP was reviewed for any projects involving Transformer upgrades and the additional MVA added was determined for each year.

3. Forecast MVA to be added for new Zone Substations planned or plans for the refurbishment / upgrade of existing Zone Substations due to growth/capacity driving by the Subtransmission Planning Group:
    a. The PIP (Portfolio Investment Plan) was obtained which contains a list of the major project / program of works planned for the following regulatory period was obtained.
    b. The PIP was reviewed for any projects involving Zone Substation Transformer replacements and the additional MVA added was determined for each year.

- **DPA0601 – Total installed capacity for first step transformation where there are two steps to reach distribution voltage**
- **DPA0602 – Total installed capacity for second step transformation where there are two steps to reach distribution voltage**
- **DPA0603 - Total zone substation transformer capacity where there is only a single step transformation to reach distribution voltage**
- **DPA0605 - Cold spare capacity of zone substation transformers included in DPA0604**

SQL Logic:

- All ZS Power Transformer assets where the Owner <> ‘Private (all others should be Essential Energy owned)
- All ZS Power Transformers with a Service Status of - ‘In Service’
- Excludes ZS Power Transformers with a Type of:
    - ‘Regulators’, ‘SWER Isolators’
      (Results in only Power Transformers)
- 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 (not this this has occurred in <1% of cases):
  - if ZS Power Transformer 'Year of Manufacture' is blank, then use the year from the 'Date Installed' attribute on the ZS Power Transformer.

An extract of these ZS Power Transformers has been reviewed by the Subtransmission Planning group and Zone Substation Engineering group who are familiar with the configuration of Essential Energy's network and transformer usage. Each transformer within the extract was tagged with a usage being:

'1' = DPA0601, those transformers which are the first step of a two step transformation to distribution voltage, eg; Coleambally 132/33kV (25MVA) as first step.

'2' = DPA0602, those transformers which are the second step of a two step transformation to distribution voltage, eg; fFollowing on from Coleambally 132/33kV, those 33/11kV transformers which take 33kV supply from the Coleambally 33kV busbar are tagged as 2.

'3' = DPA0603, those transformers which are one step transformation to distribution voltage. Those transformers generally taking primary side supply from a TransGrid busbar and transforming straight to distribution voltage, eg; Boronia St 33/11kV takes supply from TransGrid 33kV busbar.

'Spare' = DPA0605, those transformers that are deemed to be out of service, in store or on a site where physical movements are required to utilize the transformer.

'Ignore' = generally transformers that step up from one distribution voltage to another distribution voltage. Correction of some of the listed spares which are to be scrapped were ignored. Transformers that are a 'third' step, eg; Tamworth TransGrid 66kV busbar generally supplies 66/11kV transformers , thus one step. It also supplies 33/11kV transformers via a 66/33kV transformation at Quirindi (this step is ignored) and 33/11kV transformers are one step.

'Gen' = transformers used to transform from generator terminals to generator output, no distribution usage.

Neither those tagged with 'Ignore' or 'Gen' were counted.

The results from this SQL query and the mappings/updates made by the Subtransmission Planning and Zone Substation engineering in an Excel spreadsheet have then been used to group into the appropriate RIN categories.

The total capacity for 2014 was then determined by summing up the total MVA installed for that particular year and every year prior and grouped by the RIN categories above for input into the template for items DPA0601, DPA0602, DPA0603 and DPA0605.

- **DPA0604 - Total zone substation transformer capacity**

This is the total of DPA0601, DPA0602, DPA0603 and DPA0605.

Use of estimated information

- Essential Energy has used the 'Date Installed' when there is no 'Year of Manufacture' for the ZS Power Transformer as per the logic detailed above. This was only performed in <1% of cases. This date would still be reasonable.
- 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.
- A Subtransmission Planning Officer knowledgeable in these Zone Substations and Power Transformers has reviewed and overridden the 1st and 2nd step transformation MVAs if required. This is not recorded in the WASP database and the accuracy of the data is dependent upon his knowledge and the accuracy of the Zone Substation Manuals referenced.

It is assumed that going forward the majority of augmentations will be refurbishment / asset condition replacements.

The base MVA figures use estimated information as detailed in this Basis of Preparation document for Table 3.5.2.2.

The added MVA figures are based on estimated future planned zone substation transformer replacements/installations and will not take into account asset replacements due to unexpected failures or changes in funding allocations.

Material accounting policy changes

Essential Energy has not undertaken any material changes in accounting policies around the items reported in Table 3.5.2.2 over the period requested.

Reliability of information

These figures are based on estimated future planned zone substation transformer replacements/installations and will not take into account asset replacements due to unexpected failures or changes in funding allocations. The base figures used for the current zone substation transformer capacity are dependent on the accuracy of the data within the WASP database and the Zone Substation Manuals as well as assumptions made as per this Basis of Preparation document for Table 3.5.2.2.

3.5.3 Public lighting

Compliance with 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. This is in line with the Economic Benchmarking RIN Instructions and Definitions guidance issued

by the AER. Further detail has been provided in the subsequent subheadings to address compliance requirements.

Source of information

This data has been obtained from:

- Current Public Lighting luminaire and pole figures extracted from the WASP system as reported in Table 3.5.3 in the Economic Benchmarking RIN.
- Forecasts for future years based on a growth trend of 1.71% per annum for luminaires and 3.4% per annum for public lighting poles.

Methodology and Assumptions

1. Determine the current Public Lighting values.
    a. This was determined as part of the Economic Benchmarking RIN. Refer to the Basis of Preparation for Table 6.3 for the Economic Benchmarking RIN. The 2013 values were used as base values.

2. Determine the average growth rate for Public Lighting Luminaires and Public Lighting Poles over the past 8 years (as reported in the Economic Benchmarking RIN) as follows:

    Public Lighting Poles:

    a. The growth rate for each year from 2006 to 2014 was determined (([Total for Year 2] - [Total for Year 1])/[Total for Year 1])*100

    E.g. for 2010:
    (([Total for 2011] - [Total for 2010])/[Total for 2010])*100

    b. The growth rate for each of the 8 years was averaged which resulted in an average growth rate of 3.4% per annum for Public Lighting Poles. (Growth Rate 06-07 + Growth Rate 07-08….+ Growth Rate 13-14)/8

    Public Lighting Luminaires:

- **DPA0701 – Public Lighting Luminaires**

    Historical SQL Logic for 2013-14:

    - All Streetlights regardless of Owner
    - Only Streetlights with a Service Status = ‘In Service’
    - Streetlights with a Lighting Category = ‘Quarantined’ were excluded
    - Assets with a category of ‘Nightwatch Light’ were excluded

- **DPA0702 – Public Lighting Poles**

    Historical SQL Logic for 2013-14:

    - All Streetlights regardless of Owner
    - Only Streetlights with a Service Status = ‘In Service’
    - Streetlights with a Lighting Category = ‘Quarantined’ were excluded

- Assets with a category of ‘Nightwatch Light’ were excluded
- Count each pole once regardless of the number of streetlights attached.

Use of estimated information

The base/current Public Lighting figures do not use estimated information as detailed in this Basis of Preparation document for Table 3.5.3.

Material accounting policy changes

Essential Energy have not undertaken any material changes in accounting policies around the items reported in Table 3.5.3 over the period requested.

Reliability of information

The figures used as a base for current Public Lighting Poles and Luminaires are dependent on the accuracy of the data within the WASP database and the estimations and made as per thisBasis of Preparation document for Table 3.5.3.

Worksheet 3.6 – Quality of services

3.6.1.1 – 3.6.1.2 Inclusive & Exclusive of MEDs

Compliance with requirements of the notice

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

The data for 2013-14 has been collected and collated in line with the definitions.
Customer numbers include active NMI's with an active or inactive account. This is the way data has been collected and stored since PowerOn Fusion went live in November 2012.

The Tmed threshold for 2013-14 was used.

Source of information

In this section, we explain the source from which Essential Energy obtained the information provided.

Data is 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: "AP&R - economic RIN data file v2".

Methodology and Assumptions

The data has been collected and collated in line with the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER.
The Threshold for Major Event Days (TMED) for 2013-14 was applied as per the definition.

Use of estimated information

Not applicable as actual information has been provided.

Material accounting policy changes

n/a

Reliability of information

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

3.6.2 Energy not supplied

Compliance with requirements of the notice

This section contains an estimate of the energy that was not supplied as a result of Customer Interruptions as per the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER.

Source of information

Data has been sourced from reported Planned customer minute off-supply and Unplanned customer minutes off-supply.

Methodology and Assumptions

As provided in the 2013-14 Annual Regulatory Accounts.

Based on the information available the estimated kWh were determined by calculating an average kWh use per minute for the financial year, based on the total consumption divided by the total number of customers divided by the number of minutes in a year. This average kWh use per minute was then applied to the recorded Total Planned and Unplanned customer minutes off supply.

Use of estimated information

All information for these tables was based on an aggregate network level and a best estimate.

Material accounting policy changes

n/a

Reliability of information

The 2014 GWh supplied were as reported in the 2013-14 Annual Regulatory Accounts.

3.6.3 System losses

Compliance with requirements of the notice

This section contains the proportion of energy that is lost in distribution of electricity from the transmission network to Essential Energy customers.

Source of information

Result is formula driven and data utilised in Table 3.6.3 came from Table 3.4.1.2 and Table 3.4.1.3 for Electricity imported and Electricity delivered was Table 3.4.1.

Methodology and Assumptions

The methodology used in this section was as provided in the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER. Refer to Formula 2 as below.

System losses = (electricity imported – electricity delivered)/ (electricity imported) x 100

The electricity imported is the sum of the Energy received from the TNSP plus the Energy received into the DNSP system from embedded generation.

Use of estimated information

The calculation is based on tables that have been provided. Please refer to Table 3.4.1, 3.4.1.2 and 3.4.1.3.

Material accounting policy changes

n/a

Reliability of information

The data provided is considered reliable.

3.6.4 Capacity utilisation

Compliance with requirements of the notice

This section follows the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER which defines the requirements as:

"Capacity utilisation is a measure of the capacity of zone substation transformers that is utilized each year. Essential Energy must report the sum of non-coincident Maximum Demand at the zone substation level divided by summation of zone substation thermal capacity. For the purpose of this measure, thermal capacity is the rated continuous load capacity of the zone substation (with forced cooling or other capacity improving factors included if relevant). This must be the lowest of either the transformer capacity or feeder exit capacity of the zone substation. Feeder exit capacity should similarly be the continuous rating."

Source of information

The result is formula driven and data utilised in Table 3.6.4 came from Table 3.4.3.3 and Table 3.5.2.2.

Methodology and Assumptions

Essential Energy has ignored feeder capacity and used:

Table 3.4.3.3 Non–coincident Summated Raw System Annual Maximum Demand divided by Table 3.5.2.2 Total zone substation transformer capacity.

Use of estimated information

The calculation is based on data in tables that have been provided. Please refer to Table 3.4.3.3 and 3.5.2.2.

Material accounting policy changes

n/a

Reliability of information

The calculation is based on data in tables that have been provided. Please refer to Table 3.4.3.3 and 3.5.2.2.

Worksheet 3.7 – Operating environment

3.7.1 Density factors

Compliance with requirements of the notice

This section has been completed as per the provided formulas in the Economic Benchmarking RIN Instructions and Definitions document issued by the AER.

Source of information

'Customer Density' sources information from Table 3.4.2.2 Total customer numbers and Table 3.7.3 Route line lengths.

'Energy Density' sources information from Table 3.4.1 Energy delivered and Table 3.4.2.2 Total customer numbers.

'Demand Density' sources information from Table 3.4.3.3 Annual system maximum demand, DOPS0201, and Table 3.4.2.2 Total customer numbers.

Methodology and Assumptions

The methodology used in this section was as provided in the Economic Benchmarking RIN Instructions and Definitions document issued by the AER.

Customer density is the total number of customers divided by the route line length of the network.

Energy Density is the total Mwh delivered to the customer divided by the total number of customers of the network.

Demand density is the non-coincident Maximum Demand at zone substation level, in kVA units, divided by the total number of customers of the network.

Use of estimated information

These calculations are based on tables that have been provided, please refer to Table 3.4.2.2, Table 3.7.3, Table 3.4.1 and Table 3.4.3.3.

Material accounting policy changes

n/a

Reliability of information

These calculations are based on data provided in tables, please refer to Table 3.4.2.2, Table 3.7.3, Table 3.4.1.2, Table 3.4.1.3 and Table 3.4.3.3.

3.7.2 Terrain factors

Compliance with requirements of the notice

This section has been completed as per the provided formulas in the Economic Benchmarking RIN Instructions and Definitions document issued by the AER.

Source of information

- WASP system
- Essential Energy Vegetation Cost Model
- Field survey 2011/12
- Smallworld system

Methodology and Assumptions

Rural proportion
Rural proportion is calculated as short rural feeder length plus long rural feeder length divided by the total route feeder length.

Urban and CBD vegetation maintenance spans
The number of in service poles (less one) classified as urban in the WASP system plus the number of Services with an Urban attribute in Smallworld multiplied by 21.6% that is the percentage of the urban Essential Energy network that is vegetated.

The percentage vegetated is an average based on a sample of all completed scoped urban maintenance areas for the 2013-14 financial year and is derived from the number of defects reported divided by the total number of spans in the maintenance area.

The clearing of re-growth (e.g. saplings) is required to slow down or stop new trees from reaching the maintenance space and subsequently requiring on-going pruning and expenditure. The 2011-12 field survey found that 85% pruned in a year are also cleared of regrowth in Essential Energy. With this re-growth prevention program in place the percentage of maintenance spans will remain constant.

Rural vegetation maintenance spans
The number of in service poles (less one) classified as rural in the WASP system plus the number of Services with an Urban attribute in Smallworld multiplied by 25.2% that is the percentage of the rural Essential Energy network that is vegetated.

The percentage vegetated is an average based on a sample of all completed rural scoped maintenance areas for the 2013-14 financial year and is derived from the number of defects reported divided by the total number of spans in the maintenance area.

The clearing of re-growth (e.g. saplings) is required to slow down or stop new trees from reaching the maintenance space and subsequently requiring on-going pruning and expenditure. The 2011-12 field survey found that 85% pruned in a year are also cleared of regrowth in Essential Energy. With this re-growth prevention program in place the percentage of maintenance spans will remain constant.

Total vegetation maintenance spans
Sum of Rural and Urban vegetation spans outlined in the previous two metrics.

Total number of spans
Total number of in service poles stored in the WASP system for 2013-14 financial year, less one.

Average urban and CBD vegetation maintenance span cycle
Total number of urban vegetation maintenance areas completed in the financial year divided by the total number of urban areas.

Average rural vegetation maintenance span cycle
Total number of rural vegetation maintenance areas completed in the financial year divided by the total number of rural areas.

Average number of trees per urban and CBD vegetation maintenance span
The vegetation density for all years is based on field survey data from the 2011-12 financial year. 30 vegetation maintenance areas were surveyed across the Essential Energy urban network with the sample made up of vegetation maintenance areas from each of the five vegetation maintenance Zones.

Average number of trees per rural vegetation maintenance span
The vegetation density for all years is based on field survey data from the 2011-12 financial year. 66 vegetation maintenance areas were surveyed across the Essential Energy rural network with the sample made up of vegetation maintenance areas from each of the five vegetation maintenance Zones.

Average number of defects per urban and CBD vegetation maintenance span
Total number of defects reported from all sources for vegetation stored in the WASP system for the 2013-14 financial year divided by the total number of maintenance spans for urban areas.

Average number of defects per rural vegetation maintenance span
Total number of defects reported from all sources for vegetation stored in the WASP system for the 2013-14 financial year divided by the total number of maintenance spans for rural areas.

Tropical proportion
The approximate number of vegetation maintenance spans in the hot humid summer and warm humid summer regions as defined by the below map.

http://reg.bom.gov.au/jsp/ncc/climate_averages/climate-classifications/index.jsp

Data source was the Essential Energy GIS, Smallworld.

Standard vehicle access
The total number of poles that have a Terrain Type in WASP of “Accessible” as entered by (for the most part) asset inspectors divided by the total poles in the network to get a percentage of standard access for the pole network (87%).

The remaining 13% was then applied to the total number of kilometres of line in the Essential Energy network and assumes that all spans are inaccessible if the pole is inaccessible.

Bushfire risk
Essential Energy has an annual bushfire mitigation aerial patrol program that is carried out across the entire rural network. On this basis all rural spans have been included as a bushfire risk.

Use of estimated information

This has been explained in the methodology and assumptions section above.

Material accounting policy changes

n/a

Reliability of information

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

3.7.3 Service area factors

Compliance with requirements of the notice

The Notice requires the route length of overhead lines and underground cables to be determined for the 2013-14 financial year. For Table 3.7.3, the route length disregards the number of circuits that span between two poles and uses the length of any one of the circuits as the route length.
Final connections to the mains have been excluded (i.e. overhead service lines and underground service cables), as well as overhead lines and underground cables for public street lighting.

Source of information

Overhead line and underground cable data (ie 'Cables') & pole data was exported from the GE Smallworld GIS using FME and saved as MapInfo files.

Overhead line route lengths:
The pole and cable data was analysed using FME to determine where Essential Energy owned overhead cable spans were shared by other circuits, and if so these circuits were reduced to a single circuit to represent the route length for each span. The highest voltage between the two poles was assigned the voltage of the span.

Underground cable route lengths:
The cable data was analysed using FME to determine where Essential Energy owned underground cables runs parallel to other underground cables. Where there are cables in parallel, the part of any cables that are in parallel except the one with the highest voltage are removed.

Methodology and Assumptions

The total route length was determined by summing the overhead line route lengths and the underground cable route lengths determined above.

The FME Workbench filtered out all cables that were not owned by Essential Energy and Service Status was ignored. Any LV cables that had an LV Service Type of 'Service' were considered as Service, any that had an LV Service Type of 'Consumer Mains' or Sub-mains' were ignored. The Nominal Length attribute on the cable was used for the length of each cable. The results were then summarised.

Figures obtained from the GIS are assumed to be 'actual', even though it is acknowledged that the data may be incomplete, incorrectly located or duplicated.

Overhead lines:
Overhead lines are generally drawn in Smallworld on top of each other, from one pole to the next, unless the line is the same voltage as another line. In those cases, one of the lines is drawn parallel to the other line. If there is a switch in the line, the line stops 2m short of the pole to allow for the switch. The methodology used to determine the route length of overhead lines was to determine where there are multiple lines between any 2 poles and if so, remove all but one of the lines. Lines drawn parallel to a line of the same voltage were snapped to the poles, and gaps for switches were also snapped to the pole.

The route length of overhead lines has reduced due to identifying overhead LV mains as LV services.

Underground cables:
Underground cables are generally drawn in side by side in the GIS. To determine the route length of underground cables, it was assumed that if part of a cable was drawn in parallel to part of another cable in the GIS (within a tolerance of 4m) it shared a trench, and therefore the route length was the length of only one of the cables in parallel. If a cable did not have another cable in parallel then that cable (or part thereof) was accepted as the route length.

The FME Workbench used to determine the route length of underground cables was unable to resolve cables in parallel which had the same voltage. If the Workbench could resolve this issue then the total route length would be less, but it would be extremely difficult to estimate. In addition, due to the way in which underground data has been captured in the GIS and the tolerance that has been used, there would be instances where cables have been inadvertently deemed as sharing a trench and others that have been inadvertently missed.

The route length of underground lines has reduced due to improvements made to the FME Workbench method used to determine route length.

Reduction in total
There has been an overall reduction in the route length from 180,641.0km in 2013 to 173,961.7km in 2014 due to the factors described above:

- Identifying overhead LV mains as LV services;
- Improvements made to the FME Workbench method used to determine route length.

Use of estimated information

As described above

Material accounting policy changes

n/a

Reliability of information

The data that has been used for the quantity in Table 3.7.3 has come from Essential Energy's GIS, GE Smallworld. The accuracy of the information presented in the tables was directly affected by the accuracy of the data in the GIS at the time. Contributing factors to accuracy are listed below.

Data Quality:

The quality of the cable information stored in the GIS has been steadily increasing over many years, however the following points describe some of the known data quality issues:

- Data quality checks regularly highlight data quality issues, however certain issues cannot be resolved without field visits, which in many cases are not warranted due to the nature of the issue and the distance needed to be travelled;
- There is further work to do to identify LV that has been incorrectly recorded as LV services, particularly with underground. This may significantly increase the length of LV mains (and likewise reduce the length of LV services);
- Some underground cables may be missing or drawn in the incorrect location, and may not be detected because it is difficult to know exactly where they are.

Worksheet 3.7.4 – Weather stations

Compliance with requirements of the notice

This section contains the weather station number, post code and suburb for all weather stations in Essential Energy's network area that are used for reporting. This is in line with the Economic Benchmarking RIN Instructions and Definitions guidance issued by the AER.

Source of information

Data has been sourced from an internal database that stores the information provided to Essential Energy daily as provided by The Bureau of Meteorology (BoM).

Methodology and Assumptions

For Table 3.7.4 the weather station identifier and description are as provided to Essential Energy by BoM. Based on the description provided by BoM, Essential Energy has determined the post code and suburb the weather station relates to.

Use of estimated information

All information for these tables is based on information as provided by BoM.

Material accounting policy changes

n/a

Reliability of information

All stations are as reported by BoM, therefore the data provided in this table is considered reliable.