TasNetworks
Delivering your power

Distribution Economic Benchmarking RIN, 2015-16

Basis of preparation

CONTACT

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Introduction

This Basis of Preparation (BoP) represents part of the response of Tasmanian Networks, ABN 24 167 357 299 (TasNetworks), to the Regulatory Information Notice (RIN) issued in November 2013 by the Australian Energy Regulator (AER), under Division 4 of Part 3 of the National Electricity (Tasmania) Law, for the purposes of collecting information for economic benchmarking.

The information and explanatory material included in this BoP relate to TasNetworks' activities as Tasmania's licensed Distribution Network Service Provider (DNSP) during the 2015-16 Regulatory Year (referred to throughout this document as the current reporting period).

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Definitions and Interpretation

In this document and TasNetworks' response to the RIN, unless otherwise noted:

'**TasNetworks**' refers to Tasmanian Networks Pty Ltd, acting in its capacity as a licensed Distribution Network Service Provider in the Tasmanian jurisdiction of the National Electricity Market.

AER	Australian Energy Regulator
Aurora	Aurora Energy Pty Ltd, acting in its capacity as the licensed DNSP in Tasmania prior to 1 July 2014.
DM	TasNetworks' Electronic Document Management System
DNSP	Distribution Network Service Provider
Navision	TasNetworks' financial system
OTTER	Office of the Tasmanian Economic Regulator
RIN	Regulatory Information Notice
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SDW	Spatial Data Warehouse
TasNetworks	Tasmanian Networks Pty Ltd
Transend	Transend Networks Pty Ltd
WASP	Works, Assets, Solutions and People, TasNetworks' program-of-work management system

Worksheet 3.1 Revenue

Table 3.1.1 Revenue Grouping by Chargeable Quantity

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. Revenues were dissociated into Standard Control Services and Alternative Control Services, and then further apportioned according to the definitions associated with the variables.

(b) Information sources

The data for all of the variables in this table, except variable DREV0113, is sourced from TasNetworks' market and billing systems.

The data for variable DREV0113 is sourced from TasNetworks' market and billing systems and additionally from the revenue associated with the movement in unbilled energy reported within TasNetworks' Annual Reporting RIN.

(c) Methodology and assumptions

DREV0101

This variable relates to revenue derived from network tariff fixed daily charge components, and includes the following network tariffs:

- TAS31 – General Network – Residential
- TAS22 – General Network – Business
- TAS34 – General Network – Business, Nursing Homes
- TASCURT – General Network – Business, Curtilage
- TAS41 – Uncontrolled Energy
- TAS61– Controlled Energy
- TAS63 – LV Controlled Energy
- TAS75 – LV Irrigation – TOU
- TAS82 – LV kVA Demand
- TASSDM – HV kVA Specified Demand
- TAS101 – LV PAYG
- TAS94 – LV TOU – Business
- TAS93 – LV TOU – Residential
- TASCUS1 – Specific Customer Calculation – Negotiated Tariff
- TASCUS3 – Customer Calculation – Negotiated Tariff
- TASCUS4 – Customer Calculation – Negotiated Tariff
- TAS15 – Business HV – Specified Demand (>2.0MVA)

DREV0102

This variable relates to revenue derived from network tariffs comprised of energy charging parameters where charges do not vary based on time of use, and includes the following network tariffs:

- TAS31 – General Network – Residential
- TAS22 – General Network – Business
- TAS34– General Network – Business, Nursing Homes
- TASCURT – General Network – Business, CurtilageTAS41– Uncontrolled Energy
- TASUMS - Small LV Unmetered
- TAS82 – LV kVA Demand
- TAS101 – LV PAYG

DREV0103, DREV0104, DREV0105

A uniform time of use period assumption has been applied for the purposes of table completion. Various tariffs have different time periods in respect to peak, shoulder and off-peak, however for consistency the time periods outlined in the table below have been applied consistently across the network tariffs and years.

- TAS15 – Business HV – Specified Demand (>2.0MVA)
- TAS75 – LV Irrigation – TOU
- TAS93 – LV TOU – Residential
- TAS94 – LV TOU – Business
- TASSDM – HV kVA Specified Demand

Table 1. TasNetworks Time of Use Periods

Time Period	Tariff Rate
Week Day (07:00 – 22:00) (Monday – Friday)	Peak
Weekend Day (07:00 – 22:00) (Saturday and Sunday)	Shoulder
Any Day (22:00 – 24:00) (Monday – Sunday)	Off-Peak
Any Day (0:00 – 07:00) (Monday – Sunday)	Off-Peak

DREV0106

This variable relates to revenue derived from network tariffs for controlled load, and includes the following network tariffs:

- TAS61 – Controlled Energy
- TAS63 – LV Controlled Energy

DREV0107

This variable relates to revenue derived from network tariffs for unmetered supplies, and includes the following network tariffs:

- TASUMS – Small LV Unmetered; and
- TASUMSSL – Street Lighting.

DREV0108

This variable relates to revenue received as a result of excess or additional demand network charges (tariff components). TasNetworks' demand-based network tariffs include a charging parameter for excess or additional demand, demand over and above a specified or contract level is charged at a different rate. TasNetworks' demand-based network tariffs include the following:

- TASSDM – HV kVA Specified Demand
- TAS15 – HV kVA Specified Demand (>2.0 MVA)
- TASCUS1 – Customer Calculation – Negotiated Tariff
- TASCUS4 – Customer Calculation – Negotiated Tariff

DREV0109

This variable relates to revenue derived from network demand-based network tariffs (excludes revenue received as a result of excess or overrun demand charges). TasNetworks demand-based network tariffs include:

- TAS82 – LV kVA Demand
- TASSDM– HV kVA Specified Demand
- TAS15– HV kVA Specified Demand (>2.0 MVA)
- TASCUS1 – Specific Customer Calculation – Negotiated Tariff
- TASCUS3 – Specific Customer Calculation – Negotiated Tariff
- TASCUS4 – Specific Customer Calculation – Negotiated Tariff

DREV0110

This variable relates to revenue received from daily metering charge components associated with the following network tariffs:

- TAS31 – General Network - Residential
- TASCURT – General Network – Business, Curtilage
- TAS82 – LV kVA Demand
- TAS22 – General Network - Business
- TAS34– General Network – Business, Nursing Homes
- TAS94 – LV ToU Business
- TAS61 – Controlled Energy
- TAS63 – Controlled Energy
- TAS41 – Uncontrolled Energy
- TAS93 – LV ToU - Residential
- TAS75 – LV Irrigation (ToU)
- TAS101 – LV PAYG

DREV0111

This variable relates to revenue received from connection charges. TasNetworks receives no revenue from connection charges.

DREV0112

This variable relates to revenue received from the provision of public lighting services and contract lighting services.

Values for this variable were sourced from TasNetworks' metering and billing systems.

DREV0113

This variable relates to revenue received from "other" sources:

- Revenue derived from the provision of fee based services (special services) and quoted services was captured in TasNetworks' financial systems, no data manipulation was required
- The movement in unbilled energy was as reported in TasNetworks' Annual Reporting RIN

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.1.2 Revenue Grouping by Customer Type or Class

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. Revenues were dissociated into Standard Control Services and Alternative Control Services, and then further apportioned according to the definitions associated with the variables.

(b) Information sources

The data was sourced from:

- TasNetworks' market and billing systems
- TasNetworks' Annual Reporting RIN

(c) Methodology and assumptions

DREV0201

This variable relates to revenue from residential customers, which incorporates both Standard Control Services and Alternative Control Services.

All data for variable DREV0201 is sourced from TasNetworks' market and billing systems.

Standard Control Services

The following tariffs are applicable to residential consumers:

- TAS31 – General Network Residential
- TAS41 – Uncontrolled Energy
- TAS61 – Controlled Energy
- TAS63 – Controlled Energy
- TAS93 – LV ToU Residential

The following tariffs are available to both residential and non-residential customers:

- TAS41 – Uncontrolled Energy
- TAS61 – Controlled Energy
- TAS63 – Controlled Energy

TasNetworks' billing systems captures the installation type of each connection as part of the market standing data. The installation type categorises each connection point as one of:

- Residential
- Industrial
- Commercial

For those tariffs available to both residential and non-residential customers, revenue was apportioned according to the installation type classification at a NMI level.

Alternative Control Services

The primary tariff and NMI installation type was used to ensure that only revenue relating to residential customers is included in DREV0201.

DREV0202

This variable relates to revenue from non-residential customers, which incorporates both Standard Control Services and Alternative Control Services.

All data for variable DREV0202 is sourced from TasNetworks' market and billing systems.

Standard Control Services

Revenue received via the following residential tariffs:

- TAS22 – General Network – Business
- TAS34 – General Network – Business, Nursing Homes
- TASCURT – General Network – Business, Curtilage
- TAS41 – Uncontrolled Energy
- TAS61– Controlled Energy
- TAS63 – LV Controlled Energy
- TAS75 – LV Irrigation – TOU
- TAS101 – LV PAYG
- TAS94 – LV TOU – Business

The following tariffs are available to both residential and non-residential customers:

- TAS41 – Uncontrolled Energy
- TAS61 – Controlled Energy
- TAS63 – Controlled Energy

TasNetworks' billing systems captures the installation type of each connection as part of the market standing data. The installation type categorises each connection point based as either:

- Residential
- Industrial
- Commercial

For those tariffs available to both residential and non-residential customers, revenue has been apportioned according to the installation type classification at a NMI level.

Alternative Control Services

Revenue received for the provision of metering services to non-residential customers only, the primary tariff and NMI installation type has been used to ensure only revenue relating to residential customers has been included in DREV0202.

DREV0203

This variable relates to revenue from non-residential LV customers on demand tariffs, which incorporates both Standard Control Services and Alternative Control Services.

All data for variables DREV0203 is sourced from TasNetworks' market and billing systems.

Standard Control Services

The following demand tariffs are applicable to non-residential LV customers:

- TAS82 – LV KVA Demand

Alternative Control Services

The primary tariff and NMI installation type was used to ensure that only revenue relating to non-residential customers is included in DREV0203.

DREV0204

This variable relates to revenue from non-residential HV customers on demand tariffs, which incorporates both Standard Control Services and Alternative Control Services.

All data for variables DREV0204 is sourced from TasNetworks' market and billing systems.

Standard Control Services

The following demand tariffs are applicable to non-residential HV customers:

- TASSDM – HV kVA Specified Demand
- TAS15 – HV kVA Specified Demand (>2.0 MVA)
- TASCUS1-4 - Individual Network Tariff Calculations

Alternative Control Services

The primary tariff and NMI installation type was used to ensure that only revenue relating to non-residential customers is included in DREV0204.

Please note that many of these sites have contestable (unregulated) metering.

DREV0205

This variable relates to revenue from unmetered supplies, which incorporates both Standard Control Services and Alternative Control Services.

All data for variables DREV0205 is sourced from TasNetworks' market and billing systems

The applicable network tariffs are:

- TASUMS – Small LV Unmetered
- TASUMSSL – Street lighting

DREV0206

This variable relates to revenue from "other" customers, which incorporates only Alternative Control Services.

All data for variables DREV0206 is sourced from TasNetworks' market and billing systems, and TasNetworks Annual Reporting RIN.

(d) Estimated information

Not applicable, there was no estimated information.

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

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN.

(b) Information sources

2015-16 tariff approval model.

(c) Methodology and assumptions

- DREV0301 – There are no EBSS outcomes affecting revenue during the current regulatory control period because it is the first regulatory control period under the AER's EBSS scheme
- DREV0302 – STPIS revenue adjustments occurred in the current reporting period
- DREV0303 – There is no S-Factor for TasNetworks
- DREV0304 – There is no S-Factor true up applicable to TasNetworks
- DREV0305 – There are no other incentive scheme amounts applicable to TasNetworks

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 3.2 Opex

Table 3.2.1 Opex Categories

Table 3.2.1.1 Current Opex Categories and Cost Allocations
Table 3.2.1.2A Historical Opex Categories and Cost Allocations

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, showing actual reported values and historical values as if changes had not been made.

(b) Information sources

The expenditure data reported was sourced from:

- WASP
- TasNetworks' Financial Systems
- the audited Statutory Accounts

(c) Methodology and assumptions

Information was extracted from the audited Statutory Accounts. No assumptions were necessary in the preparation of the worksheet.

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(d) Estimated information

Not applicable, there is no estimated information.

Table 3.2.2 Opex Consistency

Table 3.2.2.1 Opex Consistency – Current Cost Allocation Approach
Table 3.2.2.2 Opex Consistency – Historical Cost Allocation Approaches

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN.

(b) Information sources

The expenditure data reported has been sourced from:

- WASP
- TasNetworks' Financial Systems
- the audited Statutory Accounts

(c) Methodology and assumptions

Table 3.2.2.1

Information was extracted from the audited Statutory Accounts. No assumptions were necessary in the preparation of the worksheet.

Table 3.2.2.2

Information was extracted from the audited Statutory Accounts. No assumptions were necessary in the preparation of the worksheet.

(d) Estimated information

Not applicable, there is no estimated information.

Table 3.2.4 Opex for High Voltage Customers

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN.

(b) Information sources

The expenditure data reported has been sourced from:

- WASP
- TasNetworks' Financial Systems
- TasNetworks' audited Statutory Accounts

(c) Methodology and assumptions

Not applicable, this data is estimated.

(d) Estimated information

An estimate is required because TasNetworks does not have actual information relating to this variable.

Total opex for high voltage customers was calculated by sourcing the number of high voltage customers and transformers in high voltage connections.

This total number is then multiplied by an estimated cost per transformer which was sourced from TasNetworks' Senior Asset Engineer, based on unit rates compiled within the Planning Team, and asset repair costs incurred during the year.

Worksheet 3.2.3 Provisions

Table 3.2.3 Provisions

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN:

- All relevant input cells have been populated
- All data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business
- Explanations have been provided in this Basis of Preparation for the allocation of Provisions

Provisions tables have been completed for the following provision accounts that TasNetworks holds:

- **Long Service Leave** - Employees are entitled to three months long service leave after ten years of service. Provision is calculated based on percentage probability based on employee's years of service
- **Annual Leave** - Provision for employee's entitlement to 20 days annual leave per annum
- **RBF** - Retirement Benefits Fund Defined Benefits Superannuation – TasNetworks has current and former employees who are members of a defined benefits superannuation scheme. The scheme is unfunded so TasNetworks has a provision on the balance sheet for the liability
- **SAF** - Superannuation accumulation fund – TasNetworks' employees who are not part of the defined benefits superannuation are part of an accumulation fund. TasNetworks has an obligation to pay the superannuation to the individual employee's superannuation company. The provision represents the superannuation which will be payable on the annual leave and long service leave provisions when they are paid out, plus any superannuation that has been set aside but is yet to be transferred to the individuals superannuation company
- **Public Holidays** - Provides for public holiday entitlements. Nil balance at year end
- **Sick Leave** - Provides for five days sick leave per annum per employee. Nil balance at year end
- **Time Bank** - TasNetworks allows employees to work overtime and claim time in lieu instead of overtime pay. The provision represents the amount of time in lieu that is outstanding
- **Workers compensation** - TasNetworks has workers compensation insurance. The provision is the amount payable (or receivable) from the insurance company at any point in time
- **Restructuring** - A provision for restructuring costs is required where a restructure is committed to but the payments have yet to be made
- **Payroll Tax** - TasNetworks has an obligation to pay payroll tax. The provision represents the payroll tax which will be payable on the annual leave and long service leave provisions when they are paid out

(b) Information sources

The information provided was extracted from the Corporate provisions worksheet that is contained in the Annual Regulated Accounts, which contains the allocation of provision balances and movements to the Distribution Business for each of the provision types.

(c) Methodology and assumptions

The relevant data was extracted from the Regulated Accounts. The data source is the Corporate provisions tables contained within the annual regulated accounts.

Provisions were split into Standard Control Services, Alternative Control Services and Unregulated Services using the same methodology as applied in previous regulatory years.

To populate the tables the following calculations were made:

- **Allocation across forms of control**: To allocate the provisions balances across the forms of control, the percentage spend methodology has been applied for each year. This process allocates the provisions balances and movements across the forms of control based on the portion of total spend (opex and capex) for each year
- **Allocation between opex and capex**: The provisions balances and movements have been allocated between opex and capex using labour dollars as the driver. The capex and opex portions are allocated based on the proportion of total labour dollars for both Network and Network services Businesses. This methodology is consistent with the methodology used in the current pricing determination

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 3.3 Assets (RAB)

Table 3.3.1 Regulatory Asset Base Values,
Table 3.3.2 Asset Value Roll Forward
Table 3.3.3 Total Disaggregated RAB Asset Values

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. The variables rely on historical information recorded in TasNetworks' audited Statutory Accounts and information submitted to the AER by TasNetworks in response to the AER's Annual Reporting RIN for the current reporting period.

(b) Information sources

The information is sourced as follows:

- Unless otherwise noted, actual values reconcile to values previously reported as part of the RAB roll forward underpinning the revenue calculation for the current Determination
- Current Annual Reporting RIN

(c) Methodology and assumptions

The values in this table were calculated as the average of the opening and closing RAB values for the relevant Regulatory Year.

DRAB0201, DRAB0301, DRAB0401, DRAB0501, DRAB0601, DRAB0701, DRAB1001, DRAB1101

Actual values reconcile to values previously reported as part of the RAB roll forward underpinning the revenue calculation for the current Determination (with forecasts replaced with actuals).

Capex additions reported in the current reporting period reconciles with the value reporting as part of the current Annual Reporting RIN.

DRAB0901

RAB value consistent with the RAB Framework.

Easements

The following orange easement variables have had zero entered:

- DRAB0801 - Opening value
- DRAB0802 - Inflation addition
- DRAB0805 - Actual additions (recognised in RAB)
- DRAB0806 – Disposals
- DRAB0807 - Closing value for easements asset value

Inflation addition (DRAB0102 variables)

Inflation addition was applied in a manner consistent with the AER's roll forward model.

CPI was applied consistent with that reported within TasNetworks' Regulated Accounts and Annual Reporting RIN. The opening asset value is multiplied by CPI.

Straight line depreciation (DRAB0103 variables)

Straight line depreciation was calculated based on the average remaining asset lives and standard remaining lives (for capex additions). The methodology for calculation of weighted average remaining lives and standards is consistent with that outlined in the Instructions and Definitions, that is, based on RAB value.

Disposals (DRAB0106)

This value represents proceeds from sale as reported in the Annual RIN.

Closing values (DRAB0107 variables)

These variables are calculated from the DRA0101 – DRA0106 values.

Table 3.3.3 Total Disaggregated RAB Asset Values

These variables are calculated as the average of the opening and closing RAB values for the relevant Regulatory Year for the other assets with long lives asset class.

Table 3.3 Asset Classification

Asset classes have been classified into the Benchmarking RIN reporting asset classes based on the definitions provided.

The following asset classes have been included in the for "other" asset items with long lives:

- Distribution Switching Stations (Ground) - Includes HV switching stations and switching points relating to underground assets (Standard Control and Network Services)
- Non-System Property - Property associated with depots and facilities, excludes property associated with substations and power line access (Standard Control and Network Services)
- HVST Service Connections - Service connection assets for high voltage sub transmission connected customers (Standard Control)
- HV Service Connections - Service connection assets for high voltage connected customers (Standard Control)
- HV Metering CA Service Connections - Includes voltage and current transformer, associated wiring, meter panel, meter isolation switches, fuses and circuit breakers for HV meter installations (Standard Control)
- HV/LV Service Connections - Service connection assets for customers who are supplied at high voltage and metered at low voltage (Standard Control)
- Business LV Service Connections - Includes the overhead service conductor, service fuses and associated connections/fittings used to connect domestic LV installations to the network at a voltage of 415 volts or lower (Standard Control)
- Business LV Metering CA Service Connections - Includes LV current transformers and associated wiring, meter panel, meter isolation switches, fuses and circuit breakers for business LV metering installations (Standard Control)
- Domestic LV Service Connections - Includes the overhead service conductor, service fuses and associated connections/fittings used to connect domestic LV installations to the network at a voltage of 415 volts or lower (Standard Control)
- Domestic LV Metering CA Service Connections - Includes LV current transformers and associated wiring, meter panel, meter isolation switches, fuses and circuit breakers for domestic LV metering installations (Standard Control)
- Voltage Regulators on Distribution Feeders - Includes voltage regulators for HV feeder either pole or ground mounted (Standard Control and Network Services)
- Street lighting (Alternative Control Services only)

The following asset classes have been included in the for "other" asset items with short lives:

- Emergency Network Spares - Includes other system assets for example, spare parts that are not part of inventory, such as mobile generators and emergency substations (Standard Control)
- SCADA - SCADA system and Control Centre IT systems and facilities (Standard Control)
- Motor Vehicles - Non-network capital expenditure directly attributable to the purchase, replacement, and maintenance of motor vehicle assets, excluding mobile plant and equipment (Standard Control, Network Services and Alternative Control Services)
- Minor Assets - Includes all minor assets and typically includes field services tools and equipment and IT assets (hardware) (Standard Control, Network Services and Alternative Control Services)
- Spare Parts - Includes other system assets which form inventory (Standard Control, Network Services and Alternative Control Services)
- NEM Assets - Includes assets relating to NEM entry and FRC (Standard Control, Network Services and Alternative Control Services)

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.3.4 Asset Lives

Table 3.3.4.1 Asset Lives – Estimated Service Life of New Assets
Table 3.3.4.2 Asset Lives – Estimated Residual Service Life

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. The variables rely on historical information recorded in TasNetworks' audited Statutory Accounts and information submitted to the AER by TasNetworks in response to the AER's Annual Reporting RIN for the current reporting period.

(b) Information sources

The information was sourced from the following:

- TasNetworks' Economic Benchmarking Assets models updated for the current regulatory control period
- TasNetworks' Regulated Accounts for the current reporting period

(c) Methodology and assumptions

The asset classes used are the same as the asset classes that are used to describe TasNetworks' Regulatory Asset Base.

The standard asset lives applied to each asset class are consistent with TasNetworks' submissions to the AER's current Distribution Determination. Where asset categories comprise a number of asset classes, consistent with the AER's instructions, the asset lives for the whole category were calculated by weighting the lives of individual asset classes within that category on the basis of replacement cost (as per option 2 described in the AER's Instructions and Definitions document).

The asset replacement costs used to derive weighted ages, weighted average useful lives and weighted average residual service lives for each category of asset reflect the Optimised Replacement Cost of the period additions to each asset class reported in TasNetworks' Regulated Accounts for the current reporting period.

In order to estimate residual asset lives, for each class of asset a weighted average end of year age was calculated. For assets commissioned prior to and including 1998 within each asset class, an estimate of the consolidated residual life of those assets was applied (refer Section e – Estimated Information below). The weighted average age of each asset class reflects the age of those assets as at the end of the year.

The average age for each asset class was weighted on the basis of the proportional contribution to the total cumulative replacement cost of that asset class. The estimated residual service life for a given asset class was calculated by subtracting the weighted average age of that asset class from the relevant standard asset life.

It is noted that where the period additions to an asset class are, at the end of any given regulatory year, of an age that exceeds the estimated service life of new assets in that asset class, rather than ascribe a negative residual service life to that asset class, the estimated residual service life of the assets in question was deemed to be nil. This was done to reflect that, while a negative residual service life may indicate the extent to which an asset is theoretically overdue for replacement, in practice the assets in question simply have no residual service life remaining, and the use of negative residual service lives would distort calculations of collective residual service lives.

Where an Asset Category is comprised of a single asset class, the standard operating life of that class of asset was deemed to be the estimated service life of new assets for the corresponding Asset Category, and the estimated residual service life applying to that asset class for a given regulatory year was also applied to the Asset Category in question.

In cases where an Asset Category comprises a number of asset classes, the weighted average asset ages, useful lives and residual service lives of each asset class making up the Asset Category, which have been calculated separately as described above, were themselves averaged in order to derive an average useful asset life and estimated residual service life for the Asset Category as a whole. This was done by weighting each asset class' average age, useful life and estimated residual service life on the basis of the optimised replacement cost of each asset class as a percentage of the combined replacement cost of the Asset Category in question.

As part of the AER's determination process the metering standard and average remaining lives were adjusted. These adjustments are reflected in the RAB roll forward model applied for completion of the current Benchmarking RIN Template.

(d) Asset Classification

Asset classes have been classified into the Benchmarking RIN reporting asset classes based on the definitions provided.

The following asset classes have been included in the for "other" asset items with long lives:

- Distribution Switching Stations (Ground) - Includes HV switching stations and switching points relating to underground assets (Standard Control and Network Services)
- Non-System Property - Property associated with depots and facilities, excludes property associated with substations and power line access (Standard Control and Network Services)
- HVST Service Connections - Service connection assets for high voltage sub transmission connected customers (Standard Control)
- HV Service Connections - Service connection assets for high voltage connected customers (Standard Control)
- HV Metering CA Service Connections - Includes voltage and current transformer, associated wiring, meter panel, meter isolation switches, fuses and circuit breakers for HV meter installations (Standard Control).
- HV/LV Service Connections - Service connection assets for customers who are supplied at high voltage and metered at low voltage (Standard Control)
- Business LV Service Connections - Includes the overhead service conductor, service fuses and associated connections/fittings used to connect domestic LV installations to the network at a voltage of 415 volts or lower (Standard Control)

- Business LV Metering CA Service Connections - Includes LV current transformers and associated wiring, meter panel, meter isolation switches, fuses and circuit breakers for business LV metering installations (Standard Control)
- Domestic LV Service Connections - Includes the overhead service conductor, service fuses and associated connections/fittings used to connect domestic LV installations to the network at a voltage of 415 volts or lower (Standard Control)
- Domestic LV Metering CA Service Connections - Includes LV current transformers and associated wiring, meter panel, meter isolation switches, fuses and circuit breakers for domestic LV metering installations (Standard Control)
- Voltage Regulators on Distribution Feeders - Includes voltage regulators for HV feeder either pole or ground mounted (Standard Control and Network Services)
- Street lighting (Alternative Control Services only)

The following asset classes have been included in the for "other" asset items with short lives:

- Emergency Network Spares - Includes other system assets for example, spare parts that are not part of inventory, such as mobile generators and emergency substations (Standard Control)
- SCADA - SCADA system and Control Centre IT systems and facilities (Standard Control)
- Motor Vehicles - Non-network capital expenditure directly attributable to the purchase, replacement, and maintenance of motor vehicle assets, excluding mobile plant and equipment (Standard Control, Network Services and Alternative Control Services)
- Minor Assets - Includes all minor assets and typically includes field services tools and equipment and IT assets (hardware) (Standard Control, Network Services and Alternative Control Services)
- Spare Parts - Includes other system assets which form inventory (Standard Control, Network Services and Alternative Control Services)
- NEM Assets - Includes assets relating to NEM entry and FRC (Standard Control, Network Services and Alternative Control Services)

(e) Estimated information

An approximation has been made for the 'replacement cost' and 'remaining life' of all assets commissioned prior to and including 1998 (the earliest year for which asset and replacement cost data is available). The 'replacement cost' and 'remaining life' applied in the calculation for all the pre 1998 (inclusive) assets are therefore weighted averages. The replacement cost data applied to these assets incorporates some historic adjustments that were made by the jurisdictional regulator at the establishment of the RAB to arrive at a desired revenue outcome and enshrined in the RAB values when passed to the AER. The methodology has continued to apply these estimates to ensure consistency with the treatment in the determination.

While the Category Analysis template 5.2.1 specifically details Asset Age Profile of certain assets, this information has not been incorporated into the Asset Lives calculations on the basis of the following:

1. Category Analysis template data 5.2.1 contains estimated asset data
2. Replacement cost information is not held against this asset data other than the total cost established in 1998 as noted above
3. The inclusion of asset count data in the calculation of asset lives, as has been applied by TasNetworks, does not change the derived asset life due to the RIN Asset Categories (excluding Metering and Other assets with long and short lives) comprising RAB asset classes all with the same useful life. In this case, the methodology applied does comply with the weighted average asset life calculation detailed by the AER

The useful life of Metering Assets and Other Assets with Long and Short Lives represents an estimate as the category comprises some RAB asset classes with varying useful lives.

Worksheet 3.4 Operational Data

Table 3.4.1 Energy Delivery

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. It is the total energy delivered to customers, as measured at the customers' premises.

(b) Information sources

As for Table 3.4.1.1

(c) Methodology and assumptions

The total energy delivered is the sum of variables DOPED0201 – DOPED0206.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.4.1.1 Energy Grouping – Delivery by Chargeable Quantity

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. It is the total energy delivered to customers, as measured at the customers' premises, categorised according to the RIN.

(b) Information sources

The data for all variables in this table was sourced from TasNetworks' market and billing systems.

(c) Methodology and assumptions

General: Time Periods for Time of Use Tariffs

The time periods used in TasNetworks' Time of Use Tariffs are shown in Table 1.

DOPED0201

This variable is the sum of the total energy delivered as measured at the customer connection point for the following network tariffs:

- TAS31 – General Network – Residential
- TAS22 – General Network – Business
- TAS34– General Network – Business, Nursing Homes
- TASCURT – General Network – Business, Curtilage
- TAS41 – Uncontrolled Energy
- TAS61 – Controlled Energy
- TAS63 – LV Controlled Energy
- TAS82– LV kVA Demand
- TAS101 – LV PAYG

DOPED0202, DOPED0203, DOPED0204

Data was extracted for each time period from TasNetworks' market and billing systems for the following time of use tariffs:

- TAS75 – LV Irrigation (ToU)
- TASSDM – HV kVA Specified Demand
- TAS94 – LV ToU - Business
- TAS93 – LV ToU - Residential
- TAS15 – HV kVA Specified Demand (>2.0MVA)
- TASCUS1-4 – Individual Network Tariff Calculation

Reporting methodology relating to Energy Delivery at Off-peak times has been improved to better reflect reporting requirements.

DOPED0205

This variable is the sum of the total energy delivered as measured at the customer connection point for the following controlled energy tariffs:

- TAS61 – Controlled Energy
- TAS63 - LV Controlled Energy

DOPED0206

This variable is the sum of the total energy delivered as measured at the customer connection point for the following unmetered supply tariffs:

- TASUMS – Small LV Unmetered
- TASUMSSL – Street Lighting

(d) Estimated information

Not applicable, there was no estimated information.

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

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. It shows the energy received into the distribution network from the TNSP.

(b) Information sources

Information for DOPED0301, DOPED0302, DOPED0303, and DOPED0304 is sourced from TasNetworks' metering and billing system. The time periods used in TasNetworks' Time of Use Tariffs are shown in Table 1.

This is a change in methodology from prior years to provide greater granularity of energy usage in time of use periods.

(c) Methodology and assumptions

The variable DOPED0304 is total energy received into the distribution network as reported at the connection points with the transmission network.

(d) Estimated information

Not applicable, there was no estimated information.

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

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. The energy received into the distribution network from embedded generators is categorised into residential and non-residential sources, and then further categorised into the time periods in which the generation occurred.

(b) Information sources

Data for this table is sourced from TasNetworks' market systems.

(c) Methodology and assumptions

General

The time of use periods are shown in Table 1.

Registered generator consumption data are excluded from this information.

DOPED0401, DOPED0402, DOPED403

These variables are the summed reported energy received from interval-metered, non-residential embedded generators by time of receipt.

DOPED0404

This variable reports the summed energy received from basic-metered, non-residential embedded generation, which is not captured in the variables DOPED0401, DOPED0402 and DOPED403.

DOPED0405, DOPED0406, DOPED0407

These variables are the summed reported energy received from interval-metered, residential embedded generators by time of receipt.

DOPED0408

This variable reports the summed energy received from basic-metered, residential embedded generation, which is not captured in the variables DOPED0405, DOPED0406 and DOPED407.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.4.1.4 Energy Grouping – Customer Type or Class

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. It shows the energy delivered to customers according to categories given in the RIN.

(b) Information sources

The data used to calculate the values for this table was sourced from TasNetworks' market systems:

(c) Methodology and assumptions

DOPED0501

Total energy delivered as recorded against the following residential tariffs:

- TAS31 – General Network Residential
- TAS41 – Uncontrolled Energy
- TAS61 – Controlled Energy
- TAS63 – Controlled Energy
- TAS93 – LV ToU Residential
- TAS101 – LV PAYG

The following tariffs are available to both residential and non-residential customers:

- TAS41 – Uncontrolled Energy
- TAS61 – Controlled Energy
- TAS63 – Controlled Energy

TasNetworks' billing systems captures the installation type of each connection as part of the market standing data. The installation type categorises each connection point based as either:

- Residential
- Industrial
- Commercial

For those tariffs available to both residential and non-residential customers, total energy has been apportioned according to the installation type classification at a NMI level.

Import tariff consumption has been allocated to residential customers as the geographical locations suggest the export consumption would be used by residential customers.

DOPED0502

The whole of the energy for the following tariffs was summed to calculate this variable:

- TAS22 – General Network – Business
- TAS34 – General Network – Business, Nursing Homes
- TAS41 – Uncontrolled Energy
- TASCURT – General Network – Business Curtilage
- TAS75 – LV Irrigation (ToU)
- TAS61 – Controlled Energy
- TAS63 – Controlled Energy
- TAS94 – LV ToU Business

The following tariffs are available to both residential and non-residential customers, so the energy was apportioned:

- TAS41 – Uncontrolled Energy
- TAS61 – Controlled Energy
- TAS63 – Controlled Energy

TasNetworks' billing systems captures the installation type of each connection as part of the market standing data, categorised as one of:

- Residential
- Industrial
- Commercial

For those tariffs available to both residential and non-residential customers, total energy was apportioned according to the installation type classification at a NMI level, and added to the previously obtained value for unshared tariffs.

Import tariff consumption that has been allocated to non-residential customers not on demand is based on geographical locations and the likelihood that it has been used by other users is low.

DOPED0503

For this variable, the value was calculated by summing the total energy delivered for the following non-residential low voltage demand based tariffs:

- TAS82 – LV kVA Demand

DOPED0504

For this variable, the value was calculated by summing the total energy delivered for the following non-residential high voltage demand based tariffs:

- TASSDM – HV kVA Specified Demand
- TAS15 – HV kVA Specified Demand (>2.0 MVA)
- TASCUS1-4 - Individual Network Tariff Calculations

DOPED0505

For this variable, the value was calculated by summing the total energy delivered for the following network tariffs:

- TASUMS – Small LV Unmetered
- TASUMSSL – Street lighting

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.4.2 Customer Numbers

Table 3.4.2.1 Distribution customer numbers by customer type or class
Table 3.4.2.2 Distribution customer numbers by location on the network
Table 3.4.2.3 Distribution customer numbers by TasNetworks feeder categories

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN in that the average number of active NMIs in TasNetworks network in the current reporting period is provided.

(b) Information sources

Data to calculate the values of the variables in these tables were extracted from:

- the Spatial Data Warehouse

- Bravo (NMI consumption data storage, and service order management systems)
- GenTrack (customer and NMI management system)
- the Meter Data Management System (MDMS)

(c) Methodology and assumptions

General

Queries were run to extract a count of NMIs at the beginning and the end of financial year by:

- relevant tariffs
- feeders
- reliability areas

These queries excluded NMIs on the Bass Strait Islands and NMIs with a status of 'Extinct'.

Table 3.4.2.1

Tariffs were classified into relevant RIN categories. The small volumes of NMIs with invalid tariffs were redistributed proportionally across the rest of the population.

Table 3.4.2.2 & 3.4.2.3

Feeders were classified into the relevant RIN categories. The small volumes of NMIs (mostly UMS NMIs) with unknown feeders were redistributed proportionally across the rest of the population.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.4.2.4 Unmetered Supply

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, unmetered customer numbers are counts of NMIs where calculations are made for delivery of annual energy.

(b) Information sources

Data to calculate the values of the variables in these tables was extracted from:

- the Spatial Data Warehouse
- Bravo
- GenTrack
- the Meter Data Management System (MDMS)

(c) Methodology and assumptions

General

- Queries were run to extract a count of active NMIs at the beginning and the end of financial year by relevant tariffs and averaged
- feeders
- reliability areas

These queries excluded NMIs on the Bass Strait Islands and NMIs with a status of 'Extinct'.

TasNetworks does not have any unmetered customers that do not have NMIs.

The small volumes of NMIs (mostly UMS NMIs) with unknown reliability areas were redistributed proportionally across the rest of the population.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.4.3 System Demand

Table 3.4.3.1 Annual System Maximum demand Characteristics at the Zone Substation – MW Measure

Table 3.4.3.2 Annual System Maximum demand Characteristics at the Transmission Connection Point – MW Measure

Table 3.4.3.3 Annual System Maximum demand Characteristics at the Zone Substation Level – MVA Measure

Table 3.4.3.4 Annual System Maximum demand Characteristics at the Transmission Connection Point – MVA Measure

Table 3.4.3.5 Power Factor Conversion between MVA and MW

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN.

DOPSD0101, DOPSD0104, DOPSD0107, DOPSD0110, DOPSD0201, DOPSD0204, DOPSD0207, DOPSD0210

The information provided about raw system annual maximum demands for the zone substation level and for all transmission connection points reports the amount of electricity transported through the network that has been taken from transmission connection points.

DOPSD0102, DOPSD0103, DOPSD0105, DOPSD0106, DOPSD0108, DOPSD0109,DOPSD0111, DOPSD0112, DOPSD0202, DOPSD0203, DOPSD0205, DOPSD0206, DOPSD0208, DOPSD0209, DOPSD0210, DOPSD0211

The information provided about weather adjusted system annual maximum demands for the zone substation level and for all transmission connection points has been determined in accordance with the definitions provided in the RIN.

DOPSD0301, DOPSD0302, DOPSD0306, DOPSD0308, DOPSD0309, DOPSD0310, DOPSD0307

The information provided about power factor conversion between MVA and MW has been determined in accordance with the definitions provided in the RIN.

(b) Information sources

DOPSD0101, DOPSD0104, DOPSD0107, DOPSD0110, DOPSD0201, DOPSD0204, DOPSD0207, DOPSD0210

All historical data is sourced from the transmission metering and SCADA at connection points.

DOPSD0102, DOPSD0103, DOPSD0105, DOPSD0106, DOPSD0108, DOPSD0109, DOPSD0111, DOPSD0112, DOPSD0202, DOPSD0203, DOPSD0205, DOPSD0206, DOPSD0208, DOPSD0209, DOPSD0210, DOPSD0211

All data is sourced from the latest distribution load forecast prepared by TasNetworks, which includes all historical data sourced from transmission metering and SCADA at connection points.

DOPSD0301, DOPSD0306, DOPSD0308, DOPSD0309, DOPSD0310

All data is sourced from the latest distribution load forecast prepared by TasNetworks, which includes all historical data sourced from transmission metering and SCADA at connection points.

DOPSD0302, DOPSD0307

All data is sourced from the latest distribution load forecast prepared by TasNetworks, which includes all historical data sourced from transmission metering and SCADA at connection points.

(c) Methodology and assumptions

DOPSD0101, DOPSD0104, DOPSD0107, DOPSD0110, DOPSD0201, DOPSD0204, DOPSD0207, DOPSD0210

Half hourly data were extracted from the metering and SCADA systems. Coincident and non-coincident maximum demands are extracted from this data set. Zone substations in Tasmania are substations with voltage levels between 33 kV and 11 kV. Coincident Raw System Annual Maximum Demand (DOPSD0104) is the summation of demand for all the zone substations when the total distribution demand is at its maximum.

The power factor is calculated as the average of all the half hourly measurements, and applied across the whole year when converting MW to MVA.

DOPSD0102, DOPSD0103, DOPSD0105, DOPSD0106, DOPSD0108, DOPSD0109, DOPSD0111, DOPSD0112, DOPSD0202, DOPSD0203, DOPSD0205, DOPSD0206, DOPSD0208, DOPSD0209, DOPSD0210, DOPSD0211

Half hourly data was extracted from transmission metering and SCADA systems. Coincident and non-coincident maximum demands are extracted from this data set. Annual system maximum demand characteristics at the zone substation level are taken from measurements at the transmission connection point and thus include losses in the 33 kV sub-transmission network.

Weather data was retrieved from appropriate Bureau of Meteorology weather stations around the state.

The weather correction process involves temperature sensitivity analysis at system level to determine the demand response to a change in temperature of one degree.

- The linear variation of daily maximum demand of each season against daily average temperature was taken as demand sensitivity to temperature
- The relationship between the temperature on the highest demand day and the average long term temperature at the temperature monitoring site was found, to determine the relativity to the 50 POE or 10 POE scenarios
- The 50 and 10 POE temperatures were derived from the long term seasonal minimum of daily average temperatures.
- The difference between average temperature of the maximum demand day and POE temperature was multiplied by the temperature sensitivity and added to the maximum demands to derive temperature corrected maximum demand

The power factor is calculated as the average of all the half hourly measurements and applied across the whole year when converting MW to MVA.

DOPSD0301, DOPSD0306, DOPSD0308, DOPSD0309, DOPSD0310

The power factor is calculated as the average of all the half hourly measurements by separating out into different voltage levels.

DOPSD0302, DOPSD0307

Data is not directly captured for the LV network or HV SWER lines because TasNetworks does not have systems in place to capture such detailed information. Consequently:

- The overall network power factor was used as a proxy for low voltage lines
- The network power factor for 22 kV was used as a proxy for SWER lines, because most of the SWER lines are operated at 22 kV

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.4.3.6 Demand Supplied (for Customers on this Basis) – MW Measure

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, reporting the demand associated with customers on a MW-based demand tariff.

(b) Information sources

DOPSD0401

Not applicable – there were no consumers in this category.

DOPSD0402

Not applicable – there were no consumers in this category.

(c) Methodology and assumptions

DOPSD0401

Not applicable – there were no consumers in this category.

DOPSD0402

Not applicable – there were no consumers in this category.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.4.3.7 Demand Supplied (for Customers on this Basis) – MVA Measure

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, reporting the demand associated with customers on a MVA-based demand tariff.

(b) Information sources

Data has been sourced from the TasNetworks' Market Systems.

(c) Methodology and assumptions

DOPSD0403

The data was extracted and summed for all demand steps of the following tariffs:

- TASSDM – HV kVA Specified Demand
- TAS15– HV kVA Specified Demand (>2 MVA)
- TASCUS1-4 – Individual Network Tariff Calculation

Included in the calculation were excess demand, overrun demand and allowable excess demand

DOPSD0404

The data was extracted and summed for all demand steps of the following tariffs:

- TAS82 – LV kVA Demand

Included in the calculation were excess demand, overrun demand and allowable excess demand

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 3.5 Physical Assets

Table 3.5.1 Network Capacities
Table 3.5.1.1 Overhead Network Length of Circuit at Each Voltage
Table 3.5.1.2 Underground Network Length of Circuit at Each Voltage

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN in that

- the total circuit length of TasNetworks-owned conductors and cables is provided, by voltage level; and
- The total of overhead and underground circuit lengths are equal to the applicable asset volumes currently in commission provided in Table 2.2.2 of the CA RIN, with the exception of sub transmission assets. Subs transmission asset categories do not fall into any of the asset group metrics specified in Table 2.2.2.

(b) Information sources

Data for these tables was extracted from the Asset History data warehouse.

(c) Methodology and assumptions

Queries were run on the HV_COND and LV_COND tables in the asset history data warehouse to extract into the Regulatory Reporting data warehouse a static view of conductors that were active in the system at the end of the financial year.

Queries were then run on these static data sets to determine lengths of conductor by voltage type.

HV Lines are only those owned by TasNetworks.

LV lines include all identified because the ownership information is incomplete.

Dual circuit network sections are counted as two separate lines.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.5.1.3 Estimated Overhead Network Weighted Average MVA Capacity by Voltage Class
Table 3.5.1.4 Estimated Underground Network Weighted Average MVA Capacity by Voltage Class

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, reporting a length-weighted overall circuit MVA rating based on thermal capacity, as specified.

(b) Information sources

Data for calculation of the parameters in these tables was obtained from:

- the Spatial Data Warehouse
- the distribution 'Standard Element Database'
- WASP pole inspection data

(c) Methodology and assumptions

Variables except DPA0301 & DPA0401

Please note that no ratings have been specified using voltage limitations, as this is thought to introduce too much complexity into the model.

For HV conductors, the SDW was accessed to obtain live conductor type, number of phases (n_p), line-line voltage (V_{LL}) and geographic data.

The length of each conductor segment was calculated from the geographic coordinates, and aggregated by total length, conductor type and voltage.

This was combined with the thermal current rating (I_{TH}) of the conductor type from the Standard Element Database (a conductor characteristic database used normally for network load-flow simulations), defined as the current per phase that a cable can carry continuously without exceeding its rated maximum conductor temperature, at

- Daytime 10^{o}C, <1.0 m/s wind speed for overhead lines
- 15^{o}C ground temperature for underground cables with the following assumed burial depths:

<1 kV	1 < 22 kV	>22 kV
600 mm	900 mm	1000 mm

These characteristics are maintained from a number of sources, typically manufacturer datasheets or calculations from Australian or IEC standards.

Note that these base thermal values are conservative by design (to allow for worst-case modelling) – actual peak capacity may be higher through cyclic loading schemes or more detailed cable modelling, particularly in the case of 33kV sub-transmission lines.

Using the above data, the MVA capacity (*P)* calculation used for single or three phase (SWER) line types is:

$$P_{1ph,3ph} = \frac{V_{LL}}{\sqrt{3}} n_p I_{TH}$$

For two phase lines, the following has been used:

$$P_{2ph} = V_{LL} I_{TH}$$

DPA0301 & DPA0401

A different approach was used for the variables DPA0301 and DPA0401. While a geographic LV line model is available in the SDW, overhead LV conductor type data is very poor. Fractions of LV conductor types have thus instead been estimated from pole inspection data in the WASP database, and subsequently combined with the total LV line length and number of phases from the SDW. This provides a better estimate of the network weighted average MVA capacity, for the following reasons:

- pole inspection records are well maintained and are repeated on ~5 year cycles
- fewer than one per cent of LV overhead poles did not have any conductor type associated

Pole inspection records (routinely performed for condition assessment) also list all LV conductor circuits on the pole. For each conductor type (*t*) of the (*n*) total types in the inspection database, the length of each conductor type (L_t) was estimated from the fraction of LV poles supporting that conductor (P_t):

$$L_t = \frac{P_t}{\sum_n P_t} L_n$$

Where the total length (L_n) is known from the SDW model.

The LV SDW model also contains the number of phases – this was averaged and applied across the entire network, since it could not be resolved to each conductor type in the WASP database.

These parameters were the used in same capacity calculation as the HV conductor.

For LV underground cables, it was assumed that ten per cent of cables were ducted and the remainder directly buried. This impacted the thermal ratings used in these calculations.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.5.2 Transformer Capacities

Table 3.5.2.1 Distribution Transformer Total Installed Capacity
Table 3.5.2.2 Zone Substation Transformer Capacity
Table 3.5.2.3 Distribution - Other Transformer Capacity

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, reporting distribution transformer capacities according to the definitions in the RIN.

(b) Information sources

Data for the variables in these tables was sourced from:

- the Asset History data warehouse
- TasNetworks' Inventory Management
- TasNetworks' distribution billing data

(c) Methodology and assumptions

Queries were run on tables in the asset history data warehouse that holds transformer asset information to extract into the Regulatory Reporting data warehouse a static view of all transformers/loads that were active in the system at the end of the financial year.

3.5.2.1 Distribution transformer total installed capacity

DPA0501

A query was run on the static transformer data to determine the total installed capacity of distribution transformers in the network owned by TasNetworks. Data was extracted into Table 3.5.2 Transformer Capacities – DPA0501. This figure was added to DPA0503 to produce final DPA0501.

DPA0502

TasNetworks does not possess the data for customer-owned transformers. The connected capacities of HV customers' transformers is approximated as the maximum demand of these customers.

DPA0503

Cold spare capacity holdings and total in stock capacity of distribution transformers from stored data on inventory holdings. Data was extracted into Table 3.5.2 Transformer Capacities – DPA0503.

3.5.2.2 Zone substation transformer capacity

DPA0601, DPA602

Not applicable as TasNetworks does not have any transformers that meet this condition.

DPA0603, DPA0604, DPA0605

A query was run on the static transformer data to determine the total installed capacity of zone substation transformers in the network owned by TasNetworks. Only transformers that were previously owned by Aurora Energy, and classified as zone transformers have been included. Data was extracted into *Table 3.5.2 Transformer Capacities – 3.5.2.2 and 3.5.2.3*. Transformers were classified into "Zone", "Other" and "Spare". "Zone" and "Spare" transformer capacity MVA were transferred into the template.

3.5.2.3 Distribution – other transformer capacity

TasNetworks interprets this category to include rural zone substation transformers (transformation voltages of 22/11 kV and 6.6/22 kV) and distribution HV regulating transformers.

A query was run on the static transformer data to determine the total installed capacity of zone substation transformers in the network owned by TasNetworks. Data was extracted into *Table 3.5.2 Transformer Capacities – 3.5.2.2 and 3.5.2.3*. Transformers were classified into "Zone", "Other" and "Spare".

A query was run to determine the total installed capacity of HV regulating transformers. This figure was added to the "Other" transformer capacity MVA and transferred into the template.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.5.3 Public Lighting

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, reporting on public lighting luminaires owned by TasNetworks and assets operated and maintained by TasNetworks, and public lighting poles exclusively used for public lighting and owned by TasNetworks and assets operated and maintained by TasNetworks.

(b) Information sources

Data for the variables in this table was extracted from:

- UMS view – Spatial Data Warehouse (SDW)
- Public lighting RIN data supplied by Metering Asset Strategy Team

(c) Methodology and assumptions

DPA0701

A count of public lighting luminaires (both public and privately owned) was extracted from public lighting RIN data. The public lighting RIN data was sourced in turn from Gentrack, which is the record of truth for public lighting data.

DPA0702, DPA0703

Queries were run on the UMS data in the SDW to identify public lighting poles that are dedicated to street-lighting by using the pole type attribute of "Streetlight". UMSs that were connected to poles with pole tags of 0 (108) were excluded from this query as the pole type cannot be confirmed and including these figures skewed the query.

Poles were classified as "Columns" if the pole material was "Steel – Other". All other materials were classified as "Poles".

The data was extracted into Excel workbook *Table 3.5.3 Public Lighting – PL Pole Data*.

A pivot of the pole data was extracted into worksheet *DPA0702, DPA0703* to get a unique count of asset Ids.

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 3.6 Quality of Service

Table 3.6.1 Reliability

Table 3.6.1.1 Inclusive of MEDs
Table 3.6.1.2 Exclusive of MEDs

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN; reliability is reported in accordance with the definitions provided in the RIN, in that:

- Interruptions have been defined as loss of electricity supply to a customer associated with an outage of any part of the electricity supply network, including generation facilities and transmission networks, of more than 0.5 seconds, including outages affecting single premises
- The customer interruption starts when recorded by equipment such as SCADA or, where such equipment does not exist, at the time of the first customer call relating to the network outage. An interruption may be planned or unplanned, momentary or sustained. Subsequent interruptions caused by network switching during fault finding are recorded as additional outages. An interruption ends when supply is restored to the customer
- Feeder and Community SAIDI and SAIFI are calculated in accordance with AER requirements
- Major Event Day threshold calculated in accordance with the 2.5ß methodology

(b) Information sources

The source data for these tables were extracted from the:

- Spatial Data Warehouse (SDW)
- Works Asset Management System (WASP)

(c) Methodology and assumptions

The reliability performance indices (SAIDI and SAIFI) were calculated using the number of disconnected customers and customer duration at the time of the outage.

Queries were run on WASP and the SDW to extract a base data set of outages, outage assets, customers and distribution transformers for the current reporting period (store procedure is used to create a snap shot of the table). These tables are saved in the ASP_REPORT warehouse for reporting.

An extract of Major Event Days was taken from the current Annual Reporting RIN response and cross referenced with outage data to determine the outages that occurred on major event days.

Query RIN_EB_3_6_1_1 extracts all unplanned outages, including MEDs for the current reporting period, with the outage impact measured by disconnected customers and customer duration as per the RIN requirements. Values are reported for SAIDI and SAIFI, where STPIS exclusions have been applied, and where they have not been applied.

Query RIN_EB_3_6_1_2 extracts all unplanned outages, excluding MEDs for the current reporting period, with the outage impact measured by disconnected customers and customer duration as per the RIN requirements. Values are reported for SAIDI and SAIFI, where STPIS exclusions have been applied, and where they have not been applied.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.6.2 Energy Not Supplied

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN: the energy not supplied has been estimated as per the methods in the RIN.

(b) Information sources

Data for these tables were sourced from;

- the Spatial Data Warehouse
- WASP outage data
- EB-RIN(D) 3.4.2 customer counts for the current reporting period

(c) Methodology and assumptions

N/A

(d) Estimated information

The information is considered to be an estimate because the differing methods prescribed in section 7.2 of the RIN Instructions and Definitions result in differing answers.

For every outage in the reporting period, average customer consumption was estimated for the feeder using one of the following three prescribed methods:

- Method 1: feeder demand at the time of the interruption divided by the number of customers on the feeder
- Method 2: average feeder demand derived from feeder Maximum Demand and estimated load factor, divided by the number of customers on the feeder
- Method 3: average feeder category demand derived from sum of average feeder demands divided by total customers for feeders of the appropriate category that were impacted by outages in the reporting period

Method 2 was preferred to 1 when either

- feeder demand measurements were either unavailable or suspect at the time of the outage
- outage time was in excess of 12 hours

Method 3 was only utilised when there was no other load data available.

The 12 hour threshold for Method 2 was determined through investigation of demand curves for the 20 longest outages. Consideration of feeder load profiles from days immediately previous an outage, as well as the same days in previous years, indicated that an average value was more accurate than the demand at the beginning of sustained interruptions.

The estimated load factor for Method 2 was a system-wide estimate through consideration of Maximum-to-Average demand ratios on feeders where both values were available, and data was found to be of good quality overall. Analysis indicated a system average ratio of 0.45.

The customer minutes for each outage was determined on an affected asset basis, to account for instances where partial supply was restored before the entire outage concluded.

Customer minutes were then multiplied by the average demand to give energy not supplied.

The final result is calculated by summing the result for each individual outage.

It has been assumed that:

- the methods used are sufficiently accurate for the intended purpose of the metric

- the estimated load factor is applicable throughout

The prescribed preferred method of estimating average demand from customer billing history was not used, as TasNetworks only has quarterly billing data available to estimate customers' consumption. It is therefore not possible to factor in the effects of demand coincidence which has a significant impact on the calculation of energy not supplied.

The measured value, by contrast is time-varying and accurate. Longer outages, which dominated the use of average feeder demand (Method 2) tended to result from interruption to entire or significant portions of feeders, further improving accuracy.

Table 3.6.3 System Losses

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN.

(b) Information sources

Electricity imported is sourced from:

- Table 3.4.1.2 Energy - received from TNSP and other DNSPs by time of receipt
- Table 3.4.1.3 Energy - received into DNSP system from embedded generation by time of receipt

Electricity delivered is sourced from:

- DOPED01 (in Table 3.4.1) - Total energy delivered

(c) Methodology and assumptions

The system loss percentage is calculated in accordance with the RIN.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.6.4 Capacity Utilisation

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, reporting the capacity utilisation of the distribution network in accordance with the definitions provided in the RIN.

(b) Information sources

Non-coincident summated raw system annual maximum demand (MVA measure at zone substation level) is sourced from table 3.4.3.3 (DOPSD0201).

A query was run on the static transformer data to determine the total installed capacity of zone substation transformers in the network owned by TasNetworks. Only transformers that were previously owned by Aurora Energy, and classified as zone transformers have been included.

(c) Methodology and assumptions

The capacity utilisation variable is calculated as the non-coincident summated raw system annual maximum demand (MVA measure at zone substation level) (DOPSD0201) divided by the total zone substation transformer capacity.

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 3.7 Operating environment

Table 3.7.1 Density factors

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, being calculated from other variables within the RIN.

(b) Information sources

- Table 3.4.1 DOPED01 Total Energy Delivered
- Table 3.4.2.1 DOPCN01 Total Customer Numbers
- Table 3.4.3.3 DOPSD0201 Non–coincident Summated Raw System Annual Maximum Demand
- Table 3.7.3 DOEF0301 Route Line Length

(c) Methodology and assumptions

- $DOEF0101\ (customer\ density) = DOPCN01/DOEF0101$
- $DOEF0102\ (energy\ density) = (DOPED01 * 1000)/DOPCN01$
- $DOEF0103\ (demand\ density) = (DOPSD0201 * 1000)/DOPCN01$ DOEF0103

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.7.2 Terrain Factors

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, reporting the information sought based on actual and estimated data pertaining to Route Line Length, AER feeder classification and vegetation proximity to TasNetworks' distribution network.

(b) Information sources

Data for the variables in these tables were sourced from:

- the Spatial Data Warehouse (SDW)
- Vegetation Management System
- Vegetation Contractor Expenditure

(c) Methodology and assumptions

General

The information in these tables was built upon the TasNetworks Distribution "Span Model" – a geographic a database of pairs of geographic coordinates that correspond to poles with at least one connecting conductor circuit. The Span Model has been derived from spatial conductor data in the SDW specifically to meet the AER definition of Route Line Length.

Spans containing only LV circuits are not included in the current iteration of the Span Model. TasNetworks' current active (i.e. non-reactive) vegetation management program is based upon the Span Model – LV-only spans are not actively managed.

Each span in the Span Model was assigned a classification based on the AER load-based feeder definitions: CBD, Urban, and Long/Short Rural (assigned in that order for multiple circuit spans).

TasNetworks' primary contractor (responsible for approximately 75% of work) reports the number of spans cleared by feeder. Contractors undertaking the remainder of the work do not yet have the capability to report on the required metrics. To account for this, it was assumed that the work of the other contractors was similar to that of the primary contractor, and the primary contractor data was scaled up.

By Variable

DOEF0201

The total length of long and short rural spans divided by the total route line length is taken as the rural portion.

DOEF0202 – DOEF0205

These values are extrapolated from data pertaining to TasNetworks' primary contractor.

DOEF0206, DOEF207

TasNetworks' bushfire strategy aims for 1-year cycles for all feeders inside a designated High Bushfire Risk Area. All other feeders aimed to have a 2 year vegetation management cycle target. The average span cycle has been calculated from data provided by ETS within the vegetation management system (special data warehouse).

At the time of gathering data for RIN, policy on vegetation cycles had not changed, therefore the historical cutting cycle is expected to carry through as the planned cutting cycle.

DOEF0208 – DOEF211

Trimmings were taken to correspond to a single defect, while the number of trees was taken to be trimmings plus tree removal. Trees reported in this data as "< 100 mm" or "Scrub control sapling" were excluded as these are not thought to be consistent with the AER definition of a managed "defect". The data from the primary contractor was extrapolated.

DOEF0212

No tropical vegetation communities exist in Tasmania.

DOEF0214

TasNetworks has defined a high bushfire risk zone in conjunction with industry and local climate experts, based on the "Phoenix Rapid-fire" model, which incorporates both bushfire probability/intensity and potential consequences based on infrastructure in the area. Maintenance spans within this zone have been reported.

(d) Estimated information

DOEF0213 – Standard Vehicle Access

This value was estimated as TasNetworks does not explicitly tag its network as "accessible" (or otherwise) in line with the AER definitions.

TasNetworks has a service level agreement supply of up-to-date GIS transport information. This includes known private off-road trails, in addition to all public highways and smaller streets. After excluding trails explicitly flagged "4WD only," the reported km for this factor is the total length of spans not within 25 m of any transport element.

Table 3.7.3 Service Area Factors

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, reporting the Route Line Length as defined in the RIN.

(b) Information sources

Data for this variable was sourced from the Spatial Data Warehouse (SDW).

(c) Methodology and assumptions

The Route line length is forecasted for the current reporting period based on the historical last five year data due to an application error.

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 3.7.4 Weather Stations

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, reporting active Bureau of Meteorology (BOM) weather stations in Tasmania that are relevant to TasNetworks' forecasting.

(b) Information sources

Data for this table was sourced from:

- A listing of all Australian weather stations recorded by the BOM has been downloaded from the BOM website
- Postcodes for Tasmanian towns have been downloaded from the Australia Post website
- A listing of the weather stations used as a component of the weather correction process has been derived from distribution load forecasting models

(c) Methodology and assumptions

- The BOM weather station listing has been refined to:
    - Include only those weather stations for Tasmania
    - Remove those stations that have been decommissioned by BOM
    - Remove those stations that are outside TasNetworks' service area
- The nearest locality (city, suburb, town, place) to the weather stations within the amended listing has been added
- The postcode (where available) for each locality has been added to the listing. It should be noted that some places (although within the TasNetworks service area) are not populated and do not therefore have a postcode
- Those weather stations that are used in TasNetworks' distribution load forecasting process have been assigned a materiality of "Yes". All other weather stations have been assigned a materiality of "No"

(d) Estimated information

Not applicable, there was no estimated information.


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