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TasNetworks
Delivering your power

Distribution - Reset RIN, 2019-2024

Basis of Preparation

Introduction

TasNetworks' (Tasmanian Networks Pty Ltd, ABN 24 167 357 299) is the owner and operator of the electricity distribution network in Tasmania.

This document is an attachment to the written response to the Regulatory Information Notice (**RIN**) dated 20TH October 2017 served on Tasmanian Networks Pty Ltd ABN 24 167 357 299 (**TasNetworks'**) by the Australian Energy Regulator (**AER**), hereafter called the **Reset RIN**.

For ease of reference, the numbering of the tabs and tables in the Reset RIN template is preserved in this document.

This document is the collated Basis of Preparation required by paragraph 1.3 of the RIN.

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Worksheet 2.3 Augex

Table 2.3.1 AUGEX ASSET DATA - SUBTRANSMISSION SUBSTATIONS, SWITCHING STATIONS AND ZONE SUBSTATIONS

Table 2.3.2 AUGEX ASSET DATA - SUBTRANSMISSION LINES

(a) Compliance with the requirements of the RIN

Information provided in Tables 2.3.1 and 2.3.2 were completed in accordance with the definitions and instructions provided in Appendix E 2.17 to 2.19, Part B sections of the RIN.

(b) Information sources

Information presented has been sourced from the Rosny Park Zone Substation budget update.

(c) Methodology and assumptions

Costs related to the construction of the Rosny Park Zone Substation sub-transmission feeders have been extracted from the latest project budget.

Refer Network Development Management Plan within TasNetworks' Regulatory Proposal.

(d) Estimated information

Not applicable, there was no estimated information.

Table 2.3.3 AUGEX DATA - HV/LV FEEDERS AND DISTRIBUTION SUBSTATIONS

(a) Compliance with the requirements of the RIN

Information provided in Table 2.3.3 was completed in accordance with the definitions and instructions provided in Appendix E 2.17 to 2.19, Part B sections of the RIN.

(b) Information sources

Information presented in tables 2.3.3 has been sourced from the Network Development Management Plan.

(c) Methodology and assumptions

Refer Network Development Management Plan within TasNetworks' Regulatory Proposal.

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 2.4 Augex Model

Table 2.4.1 Augex model inputs – assets status – sub-transmission lines

(a) Compliance with the requirements of the RIN

Information provided in table 2.4.1 was completed in accordance with the definitions and instructions provided in the RIN, in particular Section 2.25, and the documentation provided on the AER website.

(b) Information sources

Feeder demand data has been extracted from SCADA data accessed from the OSI soft PI historian tool, which trades loads on distribution feeders and is used to plan feeder loading and switching during daily network operations.

Feeder line ratings are manufacturers' ratings for conductor or cable. In some cases feeder ratings are the result of specific study of the burial of cable at the exit point of the substation.

Route length data has been extracted from TasNetworks' GIS systems.

Estimates of feeder demand growth have been sourced from TasNetworks' annual load forecasting activities.

(c) Methodology and assumptions

Feeder demands are extracted at a half hourly level and filtered for maximum demand information. Probability of exceedance is not calculated at a feeder level by TasNetworks'. Any feeder level maximum demand data are raw data.

Feeder demand growth at the substation level is applied across all feeders exiting each substation.

(d) Estimated information

Not applicable, there was no estimated information.

Table 2.4.2 Augex model inputs – asset status – HV feeders

(a) Compliance with the requirements of the RIN

Information provided in table 2.4.2 was completed in accordance with the definitions and instructions provided in the RIN, in particular section 2.26.

(b) Information sources

Feeder demand data has been extracted from SCADA data accessed from the PI historian tool.

Feeder line ratings are manufacturers' ratings for conductor or cable. In some cases feeder ratings are the result of specific study of the burial of cable at the exit point of the substation.

Route length data has been extracted from GIS systems.

Feeder demand growth has been extracted from annual load forecasting activities.

(c) Methodology and assumptions

Feeder demands are extracted at a half hourly level and filtered for maximum demand information. Probability of exceedance is not calculated at a feeder level by TasNetworks'. Any feeder level maximum demand data are raw data. Feeder demand growth at the substation level is applied across all feeders exiting each substation

(d) Estimated information

Not applicable, there was no estimated information.

Table 2.4.3 Augex model inputs – asset status – sub-transmission substations & switching stations and zone substations

(a) Compliance with the requirements of the RIN

Information provided in table 2.4.3 was completed in accordance with the definitions and instructions provided in the RIN, in particular section 2.27.

(b) Information sources

Zone substation demand data has been extracted from SCADA data accessed from the PI historian tool.

Transformer rating information is based on manufacturers' specifications. Demand growth has been extracted from annual load forecasting activities.

(c) Methodology and assumptions

Zone substation demands are extracted at a half hourly level by summating the two incoming sub-transmission feeders and filtering for maximum demand information. Probability of exceedance is calculated during the annual load forecasting process. For more detail on the weather correction please see the basis of preparation for section 3.4.

Estimates of zone substation demand growth are sourced from annual load forecasting activities.

(d) Estimated information

TasNetworks' does not utilise cyclic substation ratings. These have been estimated at a 30% increase of the name plate rating.

Table 2.4.4 Augex model inputs – asset status – distribution substations

(a) Compliance with the requirements of the RIN

Information provided in table 2.4.4 was completed in accordance with the definitions provided in the RIN.

(b) Information sources

Distribution substation data was extracted from GIS systems. Other data used in the calculation of utilisation was extracted from GIS systems and load forecasts.

(c) Methodology and assumptions

Utilisation for individual distribution substations is not available. Utilisation is calculated by feeder by taking the total feeder maximum demand as a percentage of the total connected transformer capacity and this utilisation is applied to every substation connected to the feeder. Feeders each have a category of Urban, Short Rural and Long Rural and the distribution substations are then grouped according to this measure. The resultant utilisations are recorded in table 2.4.4.

(d) Estimated information

Not applicable, there was no estimated information.

Table 2.4.5 Augex model inputs - network segment data

(a) Compliance with the requirements of the RIN

It is TasNetworks understanding the AER Augex Model is meant for processing Augex information where the network capacity constraint is driven by thermal overloading resulting from growing electricity peak demand. The expenditure results in replacing existing assets with higher capacity assets or/and adding new capacity in the network.

Nuttall Consulting were engaged by TasNetworks for the last Reset period (2017-2019) to assist in the assessment and reporting of Distribution's Augex Model. To prepare this model, Nuttall Consulting used the loading and rating data that TasNetworks reported in this Reset period utilising TasNetworks own augmentation forecast. Nuttall Consulting denoted approximately 60% of TasNetworks augex forecast was assessed, this based on a limited set of parameters available.

This Reset period (2019-2024) TasNetworks has utilised the 2017 AEMO Connection Point forecast model. Regionally, the AEMO demand growth forecast for Tasmania is 0%. TasNetworks agrees with this 0% growth forecast.

The historical data TasNetworks has available for augex peak demand growth data is distorted by TasNetworks CAHVF categorisation (Capacity Augmentation High Voltage Feeder). There is no split for projects specifically driven by thermal overloading with respect to other augmentation projects that address other capacity issues in the High Voltage feeder networks, including fault level, voltage, and operational development.

TasNetworks Distribution network segments grouping can reflect a sensitivity in the AER Augex model. Depending on how the MVA capacity utilisation profile is distributed (one of the asset state data inputs), the Augex Model can be very sensitive. Even a small change in one of inputs can result in disproportionate and significantly changed forecast output. This is this case for TasNetworks Distribution. The MVA capacity utilisation profile of TasNetworks Distribution zone substation network segment is distributed in a very discrete manner (as there are only 13 substations) along the 0% to 151% profile.

Given the above and the lack of historical peak demand growth data Augex Table 2.4.5 has not been completed.

TasNetworks has 15 program of works and 5 projects for the 2019-2024 Reset period all below the AER threshold value. Few of these reflect augex thermal overloading expenditure.

TasNetworks will create new work categories to capture the required reporting data.

(b) Information sources

The information provided in table 2.4.5 is not normally collected or calculated by TasNetworks' during the normal course of business.

(c) Methodology and assumptions

The primary driver for the majority of our proposed augmentation programs include:

- Fault level management;
- Steady-state MV Voltage reinforcement;
- Network Access (operational management); and
- Maintaining Jurisdictional service performance targets.

The proposed demand driven augmentation programs include:

- Sub transmission Lines – Re-rating our existing 33 kV sub transmission lines to a higher operating temperature to manage increases in summer demand using deterministic utilisation criteria. This includes some expenditure to relocate OH network sections underground where clearances cannot be achieved.
- Zone Substations – we propose no Zone Substation augmentation projects in the forecast period.
- Distribution Substations – We propose a small volume based augmentation program using deterministic utilisation criteria.

Please refer to Network Development Management Plan for more detail information on TasNetworks' augmentation programs.

(d) Estimated information

Not applicable, there was no estimated information.

Table 2.4.6 Capex and network capacity added by segment group

(a) Compliance with the requirements of the RIN

Information provided in table 2.4.6 was completed in accordance with the definitions provided in the RIN, specifically section 2.30(a)-(c)

(b) Information sources

Information provided in table 2.4.6 was extracted from the program of works tool developed for the current and upcoming revenue reset (2019-2024).

(c) Methodology and assumptions

Please refer to the relevant management plans for detail on the formulation of the programs of work.

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 2.6 Non-Network

Table 2.6.1 Non-Network Expenditure

(a) Compliance with requirements of the RIN

Information provided in table 2.6.1 Non-Network Expenditure was completed in accordance with the definitions provided in the RIN.

- All relevant cells in the template have been populated
- All data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business
- Each category of expenditure has been populated in line with the AER's definitions outlined in the Regulatory Information Notice under Division 4 of Part 3 of the National Electricity Law

The Forecast years have been appropriately calculated in real June 2019 dollars.

b) Information Sources

The data used for Table 2.6.1 is derived from the forecast capex and opex models (base step trend) and is consistent with TasNetworks' annual RIN reporting allocation process and definitions. Information was sourced from TasNetworks' financial accounting system SAP and TasNetworks' Fleet Management System.

c) Methodology and assumptions

Opex follows the base step trend methodology. Capex utilises TasNetworks' forecast capex model.

d) Estimated information

Nil estimated information

Table 2.6.2 Annual Descriptor Metrics - IT & Communications Expenditure, Motor vehicles

a) Compliance with requirements of the RIN

The information provided in Table 2.6.2 IT & Communications expenditure was completed with the definitions provided in the RIN.

The Forecast years have been appropriately calculated in real June 2019 dollars.

b) Information Sources

Fleet Management system has been used to complete Motor vehicles categories and all metrics

c) Methodology and assumptions

Employee numbers and devices remain consistent throughout the forecast period.

Motor Vehicle fleet total numbers and fleet usage remain consistent. Vehicle disposals offset by vehicle purchases

d) Estimated information

Nil estimated information.

Table 2.6.4 Information and Communications Technology – Capex by Purpose

a) Compliance with requirements of the RIN

The information provided in Table 2.6.4 Information & Communications Technology was completed in accordance with the definitions provided in the RIN.

The Forecast years have been appropriately calculated in real June 2019 dollars.

b) Information Sources

The data used for Table 2.6.4 is derived from the forecast capex and is consistent with TasNetworks' annual RIN reporting allocation process and definitions.

c) Methodology and assumptions

Project data derived from the forecast capex has been allocated into capex by purpures and reconciled back to total capex.

d) Estimated information

Nil estimated information

Worksheet 2.10 Overheads

Table 2.10.1 Network overheads expenditure
Table 2.10.2 Corporate overheads expenditure

(a) Compliance with requirements of the RIN

The information provided in Tables 2.10.1 and 2.10.2 are consistent with the requirements of the Category Analysis RIN, in that:

- The template has been prepared in accordance with RIN paragraphs 14.1-14.4 of Appendix E – Principles and Requirements
- 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

(b) Source of information

Overheads have been sourced from TasNetworks' Cost Allocation Method using the latest drivers and allocations. Total overheads by control have then been applied to the forecasted Capex model

(c) Methodology applied to determine information, including assumptions made

TasNetworks' capitalises overheads to ensure that all costs directly attributable to bringing an asset to the location and condition necessary for its use are capitalised per AASB 116.16.

The overhead costs included in this worksheet include capital and operational overheads which are summarised in worksheet 2.1 for reconciliation.

(d) Use of estimates

No estimations have been required in the collation and presentation of this information.

(e) Compliance with financial reporting framework

- Non-compliance

  There has been no non-compliance with the financial reporting framework.
- Reason for non-compliance

  Not applicable.
- Changes in accounting policies

  No estimations have been required in the collation and presentation of this information.

Worksheet 2.11 Labour

Table 2.11.3 Labour / Non-Labour Expenditure Split – Standard Control Services

(a) Compliance with the requirements of the RIN

The labour data reported in Table 2.11.3 has been prepared in accordance with the Regulatory Information Notice under Division 4 of Part 3 of the National Electricity law. On this basis, the information provided regarding labour is consistent with the requirements of the RIN, in that:

- only labour costs allocated to the provision of standard control services have been reported;
- labour used in the provision of contracts has not been reported;
- Labour has been broken down (both employees and labour contracted through hire contracts) into the categories provided in the regulatory template 2.11.
- The Forecast years have been appropriately calculated in real June 2019 dollars.

(b) Information sources

All information has been obtained from the SAP Finance and the Payroll System.

(c) Methodology and assumptions

- In-house Labour expenditure has been obtained by gathering total labour costs (based on the definition of Labour Expenditure provided by the AER) and then identifying only Standard Control labour (based on the work category codes)
- Labour expenditure outsourced to unrelated parties has been defined as contract labour engaged in undertaking standard control services. The allocation of standard control costs has been identified using total contract labour for the period based on the standard control work category codes.
- Controllable non-labour expenditure has been defined as total costs that are incurred as part of ordinary standard control business activities, excluding labour and uncontrollable expenses.
- Uncontrollable non-labour expenditure has been defined as standard control expenditure that is incurred as a result of unforeseen events, such as extreme weather conditions.

(d) Estimated information

No estimates have been used in preparing this RIN.

Worksheet 2.14 Forecast Price Changes

Table 2.14.2 Forecast Capex and Opex Price Changes

a) Compliance with the requirements of the RIN

The information provided in Table 2.14.2 Forecast Capex and Opex Price Changes was completed in accordance with the definitions provided in the RIN.

TasNetworks' has calculated labour price changes based on forecast real labour increases.

The Forecast years have been appropriately calculated in real June 2019 dollars.

(b) Information sources

External expert consultation. Refer to the Jacobs Labour Cost Escalation Report, 25 October 2017.

(c) Methodology and assumptions

TasNetworks' has not included any forecast real increase for materials price escalation.

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 2.16 Opex Summary

Table 2.16.1 Standard Control Services – Opex by driver

a) Compliance with requirements of the RIN

The information provided in Table 2.16.1 Standard control services – opex by driver was completed in accordance with the definitions provided in the RIN.

b) Information Sources

The data used for Table 2.16.1 is derived from the opex models (base step trend) and is consistent with TasNetworks' annual RIN reporting allocation process and definitions.

c) Methodology and assumptions

It is populated based on the information from base step trend modelling and described in the revenue proposal document.

d) Estimated information

Not applicable, there was no estimated information.

Worksheet 2.17 Step Changes

Table 2.17.1 Forecast Opex Step Changes for Standard Control Services

a) Compliance with requirements of the RIN

The information provided in Table 2.17.1 Step changes for standard control services – forecast opex was completed in accordance with the definitions provided in the RIN.

The step changes included in this table are based on base step trend modelling and described in the revenue proposal document.

The Forecast years have been appropriately calculated in real June 2019 dollars.

b) Information Sources

The data used for Table 2.17.2 is derived from the opex models (base step trend)

c) Methodology and assumptions

It is populated based on the information from base step trend modelling and described in the revenue proposal document.

d) Estimated information

No estimates have been used in preparing this RIN

Table 2.17.2 Forecast Capex Step Changes for Standard Control Services

Not applicable.

Table 2.17.5 Forecast Category Specific Opex

a) Compliance with requirements of the RIN

The information provided in Table 2.17.5 Forecast category specific opex was completed in accordance with the definitions provided in the RIN.

The Forecast years have been appropriately calculated in real June 2019 dollars.

b) Information Sources

The data used for Table 2.17.5 is derived from the opex models (base step trend).

c) Methodology and assumptions

Table 2.17.5 is populated based on the information from base step trend modelling and described in the revenue proposal document.

The basis for category specific forecasts are as follows:

- GSL forecast is based on 5 year average of historical actual
- ESI forecast is derived from 17-18 forecast
- NEM Levy forecast is derived from 17-18 forecast
- It is populated based on the information from base step trend modelling and described in the revenue proposal document.

d) Estimated information

No estimates have been used in preparing this RIN

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. Revenue forecasts are provided for Standard Control Services and Alternative Control Services, and then further split according to the definitions associated with the variables. Only DUOS revenue is considered for Standard Control Services.

(b) Information sources

The data for all of the variables in this table is sourced from TasNetworks' forecasting and pricing models.

(c) Methodology and assumptions

DREV0101

This variable relates to forecast revenue from network tariff fixed daily charge components, and includes all network tariffs.

DREV0102

This variable relates to forecast revenue 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, Curtilage
- TAS41– Uncontrolled Energy
- TAS82 – LV kVA Demand
- TAS101 – LV PAYG

DREV0103, DREV0104, DREV0105

Various tariffs have different time periods in respect to peak, shoulder and off-peak, these periods have been utilised for completion of this table. The table includes the following network tariffs.

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

DREV0106

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

- TAS61 – Controlled Energy
- TAS63 – LV Controlled Energy

DREV0107

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

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

DREV0108

This variable relates to forecast revenue relating to excess or additional demand network charges (tariff components). TasNetworks' demand-based network tariffs include a charging parameter for excess 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 forecast revenue relating from network demand-based network tariffs (excludes revenue received as a result of excess demand charges). TasNetworks' demand-based network tariffs include:

- TAS87 - Residential Time of Use Demand
- TAS88 - Low Voltage Commercial Time of Use Demand
- TAS89 - Large Low Voltage Commercial Time of Use Demand
- Residential Low Voltage Distributed Energy Resources
- Business Low Voltage Distributed Energy Resources
- High Voltage Embedded Network Tariff
- Business Low Voltage Embedded Network TariffTAS82 – 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 forecast revenue 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.

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 sourced from TasNetworks' forecasting and pricing models.

(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 forecasts are provided for Standard Control Services and Alternative Control Services, and then further split according to the definitions associated with the variables. Only DUOS revenue is considered for Standard Control Services.

(b) Information sources

The data was sourced from:

- TasNetworks' forecasting and pricing models.

(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' forecasting and pricing models.

Standard Control Services

The following tariffs are applicable to residential consumers:

- TAS31 – General Network Residential
- TAS41 – Uncontrolled Energy
- TAS93 – LV ToU Residential
- TAS101 – LV PAYG
- TAS61 – Controlled Energy
- TAS63 – Controlled Energy
- TAS87 - Residential Time of Use Demand
- Residential Low Voltage Distributed Energy Resources

The revenue from the combination tariffs TAS41, TAS61, TAS63 was split into DREV0201 and DREV0202 based on utilised primary tariffs.

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' forecasting and pricing models.

Standard Control Services

Revenue received via the following non-residential tariffs:

- TAS22 – General Network – Business
- TAS34– General Network – Business, Nursing Homes
- TASCURT – General Network – Business, Curtilage
- TAS75 – LV Irrigation – TOUTAS94 – LV TOU – Business
- TAS94 – LV ToU Business
- TAS41 – Uncontrolled Energy
- TAS61 – Controlled Energy
- TAS63 – Controlled Energy

The revenue from the combination tariffs TAS41, TAS61, TAS63 was split into DREV0201 and DREV0202 based on utilised primary tariffs.

Alternative Control Services

Revenue received for the provision of metering services to 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 DREV0201.

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' forecasting and pricing models.

Standard Control Services

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

- TAS82 – LV KVA Demand
- TAS88 - Low Voltage Commercial Time of Use Demand
- TAS89 - Large Low Voltage Commercial Time of Use Demand
- Business Low Voltage Distributed Energy Resources
- Business Low Voltage Embedded Network Tariff

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' forecasting and pricing models.

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); and
- TASCUS1-4 - Individual Network Tariff Calculations.
- High Voltage Embedded Network Tariff

Alternative Control Services

The primary tariff and where applicable the 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' forecasting and pricing models.

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' forecasting and pricing models.

(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

Not applicable.

(c) Methodology and assumptions

- DREV0301 – The reported Efficiency Benefit Sharing Scheme (EBSS) bonus amounts are consistent with the Post Tax Revenue Model (PTRM).
- DREV0302 – No Service Target Performance Incentive Scheme (STPIS) revenue adjustments are assumed for the 2019/20 to 2023/24 Regulatory Period.
- DREV0303 – There is no F-Factor for TasNetworks'.
- DREV0304 – There is no S-Factor true up applicable to TasNetworks'.
- DREV0305 – This variable includes Demand Management Innovation Allowances (DMIA) which are sourced from the PTRM for the 2019/20 – 2023/24 Regulatory Period.

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 3.2 Operating Expenditure

Table 3.2.1 Opex Categories and Cost Allocations
Table 3.2.2 Opex Consistency – current cost allocation approach

(a) Compliance with the requirements of the RIN

Information provided in tables 3.2.1 and 3.2.2 was completed in accordance with the definitions provided in the RIN.

(b) Information sources

The expenditure data reported was sourced from the expenditure forecast models.

(c) Methodology and assumptions

The base step trend model has been used to derive the opex forecast. The category level information has been prepared based on the historical RIN reporting.

(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

Information provided in tables 3.2.4 was completed in accordance with the definitions provided in the RIN

(b) Information sources

The expenditure data reported was sourced from TasNetworks' expenditure forecast models.

(c) Methodology and assumptions

The base step trend model has been used to derive the opex forecast. The category level information has been prepared based on the historical RIN reporting.

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 3.3 Assets (RAB)

Table 3.3.1 Regulatory Asset Base 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' within the Roll Forward Model and Post Tax Revenue Model.

(b) Information sources

The information is sourced as follows:

- Unless otherwise noted, actual values reconcile to reported RAB roll forward numbers / values underpinning the revenue calculation for the 2017-2019 Determination.

Forecasts reconcile with and are sourced from the Roll Forward Model and the Post Tax Revenue Model.

(c) Methodology and assumptions

Information reported in table 3.3.1 is the aggregate of the asset value roll forward presented by asset in table 3.3.2.

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.3.2 Asset Value Roll Forward

(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' within the Roll Forward Model and Post Tax Revenue Model.

(b) Information sources

The information is sourced as follows:

- Unless otherwise noted, actual values reconcile to reported RAB roll forward underpinning the revenue calculation for the 2017-2019 Determination.

Forecasts reconcile and are sourced from the Roll Forward Model and the Post Tax Revenue Model.

(c) Methodology and assumptions

Regulatory asset base (RAB) financial information includes data on overhead lines, underground cables, transformers and other assets. The RAB financial information has been prepared in accordance with the RAB Financial Reporting Framework as outlined in the RIN.

Aggregate RAB values were able to be directly attributed to the disaggregated asset categories based on the allocation methodology used for annual reporting RINs.

For each asset category presented:

- Opening values agrees with the previous year's closing values as per RAB roll forward underpinning the revenue calculation for the 2017-2019 Determination and the Post Tax Revenue model for Reset R19.
- The inflation addition reflects a CPI increase to the opening net book value of the assets
- Straight line depreciation is calculated based upon information contained within the RFM and PTRM.
- Regulatory depreciation is the net of the inflation addition and the straight line depreciation
- Recorded additions are in line with RFM and PTRM
- Recorded disposals are based on actual assets that were sold or forecast contained within PTRM
- Closing values are derived from the sum of all elements noted above

(d) Estimated information

Not applicable, there was no estimated information.

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' within the Roll Forward Model and Post Tax Revenue Model.

b) Information Sources

The information is sourced as follows:

- Unless otherwise noted, actual values reconcile to reported RAB roll forward values / numbers underpinning the revenue calculation for the 2017-2019 Determination.
- Forecasts reconcile with and are sourced from the Roll Forward Model and the Post Tax Revenue Model

c) Methodology and assumptions

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.

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

d) Estimated information

No estimations have been required in the collation and presentation of this information

Table 3.3.4 Asset Lives

(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' within the Roll Forward Model and Post Tax Revenue Model (adapted versions which include asset life calculations).

(b) Information sources

The information is sourced as follows:

- Unless otherwise noted, actual values reconcile to reported RAB roll forward underpinning the revenue calculation for the 2017-2019 Determination.

Forecasts reconcile with and are sourced from the Roll Forward Model and the Post Tax Revenue Model.

(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' Distribution Determination.

The calculations contained within the PTRM and RFM are used in order to estimate residual asset lives, for each class.

Where asset categories comprise a number of asset classes, the asset lives for the whole category were calculated by weighting the lives of individual asset classes within that category on the basis of % of RAB value. The weighted average age of each asset class reflects the age of those assets as at the end of the year.

Asset classes have been classified into the Benchmarking RIN reporting asset classes based on the annual RIN classifications.

(d) Estimated information

Not applicable, there was no estimated information.

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 (forecast) 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 reported against DOPED01 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 or forecast to be 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' forecasting and pricing models.

(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 the TasNetworks' Network Tariff Application and Price Guide[1].

[1] https://www.TasNetworks'.com.au/TasNetworks'/media/pdf/our-network/2017-18-Network-Tariff-Application-and-Price-Guide-APPROVED.pdf

DOPED0201

This variable is the sum of the total energy forecast to be 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
- TAS87 - Residential Time of Use Demand
- Residential Low Voltage Distributed Energy Resources
- TAS88 - Low Voltage Commercial Time of Use Demand
- TAS89 - Large Low Voltage Commercial Time of Use Demand
- Business Low Voltage Distributed Energy Resources
- Business Low Voltage Embedded Network Tariff
- High Voltage Embedded Network Tariff

DOPED0202, DOPED0203, DOPED0204

Data was extracted for each time period 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

DOPED0205

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

- TAS61 – Controlled Energy; and
- TAS63 - LV Controlled Energy.

DOPED0206

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

- TASUMS – Small LV Unmetered; and
- 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 (or forecast to be delivered) from the DNSP.

(b) Information sources

Total energy received (or forecast to be received) into the distribution network is reported at the connection points with the transmission network.

(c) Methodology and assumptions

The reported values for DOPED0301, DOPED0302 and DOPED0303 have been calculated based on long-term historical ratios.

(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 (or forecast to be 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 the TasNetworks' Network Tariff Application and Price Guide2.

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 (or forecast to be 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' forecasting and pricing models.

[2] https://www.TasNetworks'.com.au/TasNetworks'/media/pdf/our-network/2017-18-Network-Tariff-Application-and-Price-Guide-APPROVED.pdf

(c) Methodology and assumptions

DOPED0501

Total energy delivered as forecast for the following residential tariffs:

- TAS31 – General Network Residential;
- TAS41 – Uncontrolled Energy;
- TAS61 – Controlled Energy;
- TAS63 – Controlled Energy;
- TAS93 – LV ToU Residential;
- TAS41 – Uncontrolled Energy;
- TAS61 – Controlled Energy; and
- TAS63 – Controlled Energy.
- Residential Demand

DOPED0502

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

- TAS22 – General Network – Business
- TAS34 – General Network – Business, Nursing Homes
- TASCURT – General Network – Business Curtilage
- TAS75 – LV Irrigation (ToU)
- TAS94 – LV ToU Business

DOPED0503

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

- TAS82 – LV kVA Demand
- Large Low Voltage Commercial Demand
- Low Voltage Commercial Demand

DOPED0504

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

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

DOPED0505

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

- TASUMS – Small LV Unmetered
- TASUMSSL – Street lighting

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.4.3 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.

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

DOPSD0102, DOPSD0103, DOPSD0105, DOPSD0106, DOPSD0108, DOPSD0109, DOPSD0111, DOPSD0112, DOPSD0202, DOPSD0203, DOPSD0205, DOPSD0206, DOPSD0208, DOPSD0209, DOPSD0211, DOPSD0212

The data from 2017-18 to 2023-24 are derived from that of 2016-17 by applying the scaling factor which is the ratio of forecast load of the relevant year to the actual data of 2016-17, while the data for 2016-17 were sourced from the transmission metering and SCADA at connection points.

DOPSD0301, DOPSD0306, DOPSD0308, DOPSD0309, DOPSD0310

The data from 2017-18 to 2023-24 are derived from that of 2016-17 by applying the scaling factor which is the ratio of forecast load of the relevant year to the actual data of 2016-17, while the data for 2016-17 were sourced from the transmission metering and SCADA at connection points.

DOPSD0302, DOPSD0307

The data from 2017-18 to 2023-24 are derived from that of 2016-17 by applying the scaling factor which is the ratio of forecast load of the relevant year to the actual data of 2016-17, while the data for 2016-17 were sourced from the transmission metering and SCADA at connection points.

(c) Methodology and assumptions

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

DOPSD0211, DOPSD0212

For 2016–17 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.

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, DOPSD0304, 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.

(d) Estimated information

DOPSD0302, DOPSD0307

Data is not directly captured for the LV network or HV SWER lines because TasNetworks' does not have the systems in place needed to capture the level of detail sought by the AER. 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

All data from 2017-18 to 2023-24 are based on AEMO's load forecast.

Table 3.4.3.6 Demand Supplied (for customers charged on this basis) – MW measure

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. It shows the demand supplied (or forecast to be supplied) to customers according to the categories given in the RIN.

(b) Information sources

The data used to calculate the values for this table was sourced from TasNetworks' forecasting and pricing models.

(c) Methodology and assumptions

DOPSD0401

- No applicable tariffs

DOPSD0402

Total demand supplied as forecast for the following tariffs:

- TAS87 - Residential Time of Use Demand
- Residential Low Voltage Distributed Energy Resources
- TAS88 - Low Voltage Commercial Time of Use Demand
- Business Low Voltage Distributed Energy Resources

(d) Estimated information

Not applicable, there was no estimated information.

Table 3.4.3.7 Demand Supplied (for customers charged on this basis) – MVA measure

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN. It shows the demand supplied (or forecast to be supplied) 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' forecasting and pricing models.

(c) Methodology and assumptions

DOPSD0403

This variable captures the predicted total excess or additional demand supplied for the below tariffs.

- TASSDM – HV kVA Specified Demand;
- TAS15 – HV kVA Specified Demand (>2.0 MVA)
- TASCUS1-4 – Customer Calculation – Negotiated Tariff

DOPSD0404

This variable captures the predicted total demand supplied as forecast for the below tariffs. It excludes excess demand which is reported under DOPSD0403.

- TASSDM – HV kVA Specified Demand;
- TAS15 – HV kVA Specified Demand (>2.0 MVA)
- TASCUS1-4 – Customer Calculation – Negotiated Tariff
- TAS82 – LV kVA Demand
- TAS89 - Large Low Voltage Commercial Time of Use Demand

Business Low Voltage Embedded Network Tariff

- High Voltage Embedded Network Tariff

(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

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN in that a seven year forecast for the total circuit length of TasNetworks'-owned conductors is provided, based on historical circuit lengths.

(b) Information sources

Data for these tables was extracted from previous economic benchmarking RINs submitted by TasNetworks' and Aurora Energy.

(c) Methodology and assumptions

Five years of circuit length data for each voltage level was populated in a spreadsheet from previous economic benchmarking RIN submissions. The Excel function LINEST (linear regression) was used to determine a linear model for future year's circuit lengths. This linear model was used to forecast the circuit lengths for future years. Where the circuit length is zero and has a negative slope coefficient, the forecast for future years is set as zero.

(d) Estimated information

Not applicable, there was no estimated information.

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 a seven year forecast for the total circuit length of TasNetworks'-owned cables is provided, based on historical circuit lengths.

(b) Information sources

Data for these tables was extracted from previous economic benchmarking RINs submitted by TasNetworks' and Aurora Energy.

(c) Methodology and assumptions

Five years of circuit length data for each voltage level was sourced from previous economic benchmarking RIN submissions. The Excel function LINEST (linear regression) was used to determine a linear model for future year's circuit lengths. This linear model was used to forecast the circuit lengths for future years. Where the circuit length is zero and has a negative slope coefficient, the forecast for future years is set as zero.

(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 (SDW);
- The distribution "Standard Element Database"; and
- Pole inspection data stored in WASP (TasNetworks' program of work management system)

(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 (np), line-line voltage (VLL) 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 (ITH) 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; or

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; and

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 (Lt) was estimated from the fraction of LV poles supporting that conductor (Pt):

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

Where the total length (Ln) 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

(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; and
- TasNetworks' distribution billing data.

(c) Methodology and assumptions

Queries were run on tables in the asset history data warehouse that hold 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.

DPA0501

Five years of transformer data was populated in a spreadsheet from previous economic benchmarking RIN submissions. The excel function LINEST (linear regression) was used to determine a linear model for future year's transformer capacity. This linear model was used to forecast the transformer capacity for future years. Where the capacity is zero and has a negative slope coefficient, the forecast for future years is set as zero. 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.

Five years of High Voltage customer's transformer capacity was populated in a spreadsheet from previous economic benchmarking RIN submissions. The excel function LINEST (linear regression) was used to determine a linear model for future year's transformer capacity. This linear model was used to forecast the transformer capacity for future years. Where the circuit length is zero and has a negative slope coefficient, the forecast for future years is set as zero.

DPA0503

Cold spare capacity holdings and total in stock capacity of distribution transformers from stored data on inventory holdings. Five years of spare capacity was populated in a spreadsheet from previous economic benchmarking RIN submissions. The excel function LINEST (linear regression) was used to determine a linear model for future year's cold spare capacity. This linear model was used to forecast the cold spare capacity for future years. Where the capacity is zero and has a negative slope coefficient, the forecast for future years is set as zero. Data was extracted into Table 3.5.2 Transformer Capacities – DPA0503.

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.

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 was extracted from public lighting RIN 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.

Poles with a UMS type of PRIVATE were excluded. This is because the primary function of these lights is not for public lighting, and does not meet the definition provided in clause 6.3.

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 3.6 Quality of service data

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 in that

A seven year forecast for the total energy not supplied by TasNetworks' is provided, based on historical estimations of energy not supplied.

(b) Information sources

Data for these tables was extracted from previous economic benchmarking RINs submitted by TasNetworks' and Aurora Energy.

(c) Methodology and assumptions

Five years of energy not supplied data for each outage type (planned vs. unplanned) was populated in a spreadsheet from previous economic benchmarking RIN submissions. The Excel function LINEST (linear regression) was used to determine a linear model for future year's energy not supplied. This linear model was used to forecast energy not supplied for future years.

(d) Estimated information

Not applicable, there was no estimated information.

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; and

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 equation defined in 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

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 factors

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 6.2.4 Total Customer Numbers

DOPSD0201 Non–coincident Summated Raw System Annual Maximum Demand – calculated as required

Table 3.7.3 DOEF0301 Route Line Length

(c) Methodology and assumptions

DOEF0101 Customer density: Total Customer Numbers / DOEF0301

DOEF0102 Energy density: DOPED01 / Total Customer Numbers

DOEF0103 Demand Density: DOPSD0201 / Total Customer Numbers

(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.

Fields containing span data have been escalated for future years based upon the annual growth of the system. An assumption has been made that the percentage of increase in spans over this period will continue in the future.

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 vegetation clearance (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 TasNetworks' primary vegetation clearance contractor within the vegetation management system (special data warehouse).

At the time of gathering data for RIN, TasNetworks' policy on vegetation cycles had not changed. Therefore, the historical cutting cycle is expected to carry through as the planned cutting cycle for the coming regulatory period.

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 to cover the rest of the network.

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 for the 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 meters 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 TasNetworks' Spatial Data Warehouse (SDW).

(c) Methodology and assumptions

The information in these tables is built upon the TasNetworks' Distribution "Span Model" – a geographic 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.

The total length of the Span Model, developed explicitly along the definition of this factor, has been reported for all HV routes. Multiple LV circuits are modelled as single lines in the SDW, hence a separate spatial query was run to get the length of a LV spans outside the span model. The reported Route Line Length is the sum of lengths of the span model and separate LV spans.

(d) Estimated information

Not applicable, there was no estimated information.

Worksheet 5.4 Maximum Demand and Utilisation at Spatial Level

Table 5.4.1 Non-Coincident & Coincident Maximum Demand
Table 5.4.2 Expected Unserved Energy

(a) Compliance with the requirements of the RIN

The information provided about the non-coincident and coincident maximum demands for the zone substations in Table 5.4.1 Non-coincident & Coincident Maximum Demand at network level is consistent with the requirements of the RIN. All non-scheduled embedded generation data for embedded generators over 0.5MW are included and represents net exports to the network at the connection point.

The information provided about the expected unserved energy for the zone substations in Table 5.4.2 Expected Unserved Energy is consistent with the requirements of the RIN.

(b) Information sources

The forecasts from 2017-18 to 2023-24 are derived from 2016-17 data by applying a scaling factor, which is the ratio of forecast load of the relevant year to the actual data for 2016-17. AEMO's load forecast was applied.

The data from 2017-18 to 2023-24 are equal to that of 2016-17, while the data for 2016-17 was extracted from TasNetworks' Spatial Data Warehouse

(c) Methodology and assumptions

The substation and transformer MVA ratings provided are based on 'cyclic rating' as required by the RIN. This applies to substation normal and emergency ratings as well as individual transformer ratings. Substation ratings are typically based on nameplate rating from the equipment manufacturer. As TasNetworks' does not currently have thermal models of the transformer loading capacity the cyclic ratings provided are a 30% increase of nameplate continuous rating.

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

Worksheet 6.1 Telephone Answering

Table 6.1.1 Telephone Answering Data

(a) Compliance with the requirements of the RIN

Information provided in table 6.1.1 was completed in accordance with the definitions provided in the RIN.

(b) Information sources

- Fault telephone answering data for the period up to and including 31/10/2014 – Data extracted from "High Path" – Aurora Energy telephone answering software
- Fault telephone answering data from 01/11/2014 onwards the Data extracted from "OpenScape Contact Centre" – TasNetworks' telephone answering software.

(c) Methodology and assumptions

Missing "Total number of calls received" and "calls abandoned within 30 seconds" data was replaced with a 0.

TasNetworks' does not have payment lines or automated interactive services.

(d) Estimated information

No information was estimated.

Worksheet 7.4 Shared Assets

Table 7.4.1 Total Unregulated Revenue Earned with Shared Assets

a) Compliance with requirements of the RIN

Information provided in table 7.4.1 Total unregulated revenue earned with shared assets was completed in accordance with the definitions provided in the RIN.

The Forecast years have been appropriately calculated in real June 2019 dollars

b) Information Sources

The information has been sourced from TasNetworks' financial system SAP.

c) Methodology and assumptions

Pole rental is the only unregulated revenue currently identified as being earned from shared assets.

d) Estimated information

No estimates have been used in preparing this RIN.

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Worksheet 2.5 Connections

Table 2.5.2 Cost Metrics by Connection Classification
Table 2.5.3 Volumes by Connection Classification

(a) Compliance with the requirements of the RIN

The information provided in Table 2.5.2 Cost Metrics by Connection Classification and Table 2.5.3 Volumes by Connection Classification are consistent with the requirements of the RIN, in particular sections 2.31 to 2.40.

(b) Information sources

The data used for these Tables has been derived from the TasNetworks' Annual RIN datasets.

(c) Methodology and assumptions

A weighted average allocation has been used for years 2008-13 as the proportion of the total capital contributions. The allocation / data capture processes have been across multiple applications. As a result the historical allocation process may be different across the period defined.

(d) Estimated information

Not applicable, there was no estimated information.

New Historical Category Analysis Data –

Worksheet 2.6 Non-Network

Table 2.6.4 Information & Communications Technology - capex by purpose

(a) Compliance with the requirements of the RIN

The information provided in Table 2.6.4 Information & communications technology – capex by purpose is consistent with the requirements of the RIN, specifically, Appendix E, Part B, section 2.44 and the relevant definitions in Appendix F.

(b) Information sources

The data used for these Tables has been derived from TasNetworks' Annual RIN datasets.

(c) Methodology and assumptions

A breakdown of the programme of work projects is required to categorise individual projects. The breakdown was obtained from Capital Review Team annual reports in the Aurora Energy Document Management (DM) system.

Individual projects were then allocated to the specified categories in the Worksheet.

Note that the totals are combined Distribution and Shared Services (shared with Retail). These totals are used to apportion the reported Distribution RIN total to the category level.

Using the RIN total, the CRT total and the CRT project total by category, the RIN total is apportioned to become the category total.

(d) Estimated information

Not applicable, there was no estimated information.

New Historical Category Analysis Data –

Worksheet 2.10 Overheads

Table 2.10.1 Network overheads expenditure
Table 2.10.2 Corporate overheads expenditure

(a) Compliance with requirements of the RIN

The information provided in Tables 2.10.1 and 2.10.2 are consistent with the requirements of the RIN.

(b) Source of information

The data used for these Tables has been derived from TasNetworks' Annual RIN datasets.

(c) Methodology applied to determine information, including assumptions made

Values have been derived from TasNetworks' Annual RIN datasets. The totals have been applied to these tables...

(d) Use of estimates

No estimations have been required in the collation and presentation of this information.

Tasmanian Networks Pty Ltd