TasNetworks
Delivering your power

Transmission Economic Benchmarking Regulatory Information Notice, 2020-21

Basis of Preparation

CONTACT

This document is the responsibility of the Regulation, Policy and Strategic Asset Management Group within Tasmanian Networks Pty Ltd (ABN 24 167 357 299). Please contact the indicated owner of the document with any queries or suggestions.

RESPONSIBILITIES

Document Owner

Regulation Leaderr
Tasmanian Networks Pty Ltd
1 – 7 Maria Street
Lenah Valley TAS 7008
[redacted]

Document Management

Regulation, Policy and Strategic Asset Management Group

Introduction

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

This Basis of Preparation (**BoP**) forms part of the response of 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 Transmission Network Service Provider (**TNSP**) during the 2020-21 Regulatory Year (referred to throughout this document as the current reporting period).

AER's Instructions

The AERs instructions in completing the economic benchmarking RIN is to provide a BoP that demonstrates how the information provided in response to the RIN request complies with the requirement of the RIN. The minimum requirements of the BoP as per schedule 2 of the notice are set out below.

Table 1 - AER Requirements of the BoP

2.2 (a)	demonstrate how the information provided is consistent with the requirements of the notice.
(b)	explain the source from which we obtained the information provided.
(c)	explain the methodology we applied to provide the required information, including any assumptions made.
(d)	explain, in circumstances where we cannot provide input for a variable using actual information and therefore must provide input using estimated information: (1) why an estimate was required, including why it was not possible to use actual information; (2) the basis for the estimate, including the approach used, assumptions made and reasons why the estimate is our best estimate, given the information sought in the notice.

Definitions and interpretation

AER	Australian Energy Regulator
AMIS	Asset Management Information System
CAM	Cost Allocation Method
DBill	TasNetworks' Market and Billing System
DM	TasNetworks' Electronic Document Management System
Gentrack	TasNetworks' Market Systems Database
GIS	Geographical Information System
GTech	Intergraph G/Technology Geographic Information System
OTTER	Office of the Tasmanian Economic Regulator
POW	Programme of Work
RIS	Ratings Information System
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SAP	TasNetworks' asset management, finance, procurement, human resources and payroll system
SCS	Standard Control Services
SDW	Spatial Data Warehouse
SOM	TasNetworks' Service Order Management system
UG	Underground (cable)
Secondary Systems	Encompasses protection systems, SCADA and Network Control
Substations Primary Systems	Encompasses power transformers, switchbays, transmission cables and reactive plant
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.
Telecommunications	Encompasses any telecommunications related asset
Transmission Lines	Encompasses towers, support structures and conductors
VMS	Vegetation Management System
WASP	TasNetworks' program-of-work management system (Works, Assets, Solutions and People), which was retired on 3 March 2018

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Template 3.1 Revenue

Table 3.1.1: Revenue grouping by chargeable quantity	**Consistency of information with the requirements of the RIN** The information in Table 3.1.1 has been presented in accordance with the definitions and requirements of the RIN. Revenue information presented has been split in accordance with the categories in the templates. Only prescribed transmission revenues have been included in the worksheet.
	Source of information Reported prescribed transmission revenues have been extracted from TasNetworks' metering and billing system or summary information prepared from TasNetworks' metering and billing system which reconciles to TasNetworks' financial accounts.
	Methodology and assumptions made All revenues reported have been allocated to the chargeable quantity that most closely reflects the basis upon which the revenue was charged by TasNetworks. No assumptions were necessary in the preparation of the worksheet.
	Use of estimates No estimates have been required in the collation and presentation of this information.
Table 3.1.2: Revenue grouping by type of connected equipment	**Consistency of information with the requirements of the RIN** The information in Table 3.1.2 has been presented in accordance with the definitions and requirements of the RIN. Revenue information presented has been split in accordance with the categories in the templates. Only prescribed transmission revenues have been included in the worksheet.
	Source of information Reported prescribed transmission revenues have been extracted from TasNetworks' metering and billing system or summary information prepared from TasNetworks' metering and billing system which reconciles to TasNetworks' financial accounts.
	Methodology and assumptions made All revenues reported have been allocated to the chargeable quantity that most closely reflects the basis upon which the revenue was charged by TasNetworks. No assumptions were necessary in the preparation of the worksheet.
	Use of estimates No estimates have been required in the collation and presentation of this information.
Table 3.1.3: Revenue (penalties) allowed (deducted) through	**Consistency of information with the requirements of the RIN** The information in Table 3.1.3 has been presented in accordance with the definitions and requirements of the RIN. Revenue information presented has been split in accordance with the categories in the templates. Only prescribed transmission revenues have been included in the worksheet.
	Source of information

incentive schemes	The Service Target Performance Incentive Scheme (**STPIS**) reward included in the worksheet is based on the actual reward approved for the financial year and recovered through invoiced prescribed revenues. Post Tax Revenue Model (for Efficiency Benefit Sharing Scheme and Capital Expenditure Sharing Scheme).
	Methodology and assumptions made The rewards of the incentive schemes have been reflected in the year that the penalty or reward is applied. The reported STPIS reward was extracted from the information maintained in the pricing model for the financial year. The Efficiency Benefit Sharing Scheme and Capital Expenditure Sharing Scheme value are the unsmoothed amount as per the AERs revenue determination. Capital Expenditure Sharing Scheme is included under Other. No assumptions were necessary in the preparation of the worksheet.
	Use of estimates No estimates have been required in the collation and presentation of this information.

Template 3.2 Operating expenses

Table 3.2.1: Opex categories	**Consistency of information with the requirements of the RIN** The information in Table 3.2.1 has been presented in accordance with the definitions and requirements of the RIN. Only prescribed transmission operational expenditure (**Opex**) has been included in the worksheet. Opex has been prepared for all Regulatory Years in accordance with TasNetworks' Cost Allocation Approach and directions within the Information Guidelines for the most recent completed Regulatory Year.
	Source of information Information was extracted from the audited Regulatory Financial Statements. The reported Opex is consistent with information reported in the audited Regulatory Financial Statements.
	Methodology and assumptions made No assumptions were necessary in the preparation of the worksheet.
	Use of estimates No estimates have been required in the collation and presentation of this information.
Table 3.2.3: Provisions	**Consistency of information with the requirements of the RIN** The information in Table 3.2.3 has been presented in accordance with the definitions and requirements of the RIN. Only provisions for prescribed transmission services have been included in the worksheet.

	Source of information Opening and closing balances for annual leave, long service leave, superannuation and other minor provisions were taken from the audited Regulatory Financial Statements. Amounts incurred and charged against the provision during the period – being annual leave or longservice leave taken or paid out for departures – were taken from the payroll system. Amounts incurred and charged against the provision during the period were taken from the detailed superannuation general ledger accounts. ***The reported provisions are consistent with information previously reported in the audited Regulatory Financial Statements.***
	Methodology and assumptions made ***Annual leave*** Increases to the provision were derived as the reconciling item as all other factors were known. ***Long service leave*** Increases to the provision were derived as the reconciling item as all other factors were known. ***Superannuation*** Increases to the provision during the period was derived as the reconciling item as all other factors were known. Interest incurred on the defined benefit liability and actuarial gains and losses have been classified as neither Opex nor capital expenditure (**Capex**). ***Other provisions*** Other minor provisions include provisions for redundancies, workers compensation, timebank and provisions for employee incentives. Amounts incurred and charged against the provisions during the period, increases to the provisions and reversals of unused amounts of the provisions were taken from the general ledger. ***Split between Operating and Capital Expenditure*** The provision balances and movements have been allocated between Opex and Capex using labour dollars as the driver.
	Use of estimates No estimates have been required in the collation and presentation of this information.

Template 3.3 Assets (regulatory asset base)

Table 3.3.1: – Regulatory asset base values	**Consistency of information with the requirements of the RIN** The Regulatory Asset Base (**RAB**) financial information has been prepared in accordance with the RAB Framework as outlined in the RIN.
	Source of information The reported RAB information has been sourced from the reconciliations of property, plant and equipment, and the underlying detailed asset records for prescribed transmission assets.

	Methodology and assumptions made Information reported in table 3.3.1 is the aggregate of the asset value roll forward presented by the assets in table 3.3.2. RAB financial information includes data on overhead lines, underground cables, transformers and other assets.
	Use of estimates No estimates have been required in the collation and presentation of this information.
Table 3.3.2: Asset value roll forward	**Consistency of information with the requirements of the RIN** The RAB financial information has been prepared in accordance with the RAB Financial Reporting Framework as outlined in the RIN.
	Source of information The reported RAB information has been sourced from the reconciliations of property, plant and equipment (and the underlying detailed asset records) for prescribed transmission assets.
	Methodology and assumptions made RAB financial information includes data on overhead lines, underground cables, transformers and other assets. Aggregate RAB values were able to be directly attributed to the disaggregated asset categories by reviewing the underlying detailed asset records and allocating them directly to the asset categories as required. For each asset category presented: • opening values agreed with the previous year's closing values; • the inflation addition reflects a consumer price index (**CPI**) increase to the opening net book value of the assets; • straight line depreciation is calculated based upon the estimated useful lives of the assets; • regulatory depreciation is the net of the inflation addition and the straight line depreciation; • recorded additions are based on the cost of the assets for regulatory accounting purposes; • Roll Forward Model adjustments have been captured in the actual additions for the financial year; • recorded disposals are based on actual assets that were sold or scrapped in the financial year; and • closing values are derived from the sum of all elements noted above.
	Use of estimates No estimates have been required in the collation and presentation of this information.
	Consistency of information with the requirements of the RIN

Table 3.3.3: Total disaggregated regulatory asset base asset values	The RAB financial information has been prepared in accordance with the RAB Framework as outlined in the RIN. Information reported in table 3.3.3 has been taken from the average of the opening and closing value of each asset class presented in the asset value roll forward table at 3.3.2 as per the requirement of the RIN.
	Source of information The reported RAB information has been sourced from the reconciliations of property, plant and equipment for prescribed transmission assets.
	Methodology and assumptions made RAB financial information includes data on overhead lines, underground cables, transformers and other assets.
	Use of estimates No estimations have been required in the collation and presentation of this information.
Table 3.3.4: Asset lives	**Consistency of information with the requirements of the RIN** The RAB financial information has been prepared in accordance with the RAB Framework. The useful lives presented are calculated as a weighted average of the entire asset class calculated in accordance with the instructions in the RIN.
	Source of information The reported RAB information has been sourced from the reconciliations of property, plant and equipment (including the underlying detailed asset records) for prescribed transmission assets.
	Methodology and assumptions made RAB financial information includes data on overhead lines, underground cables, transformers and other assets. Assets are allocated a useful life at acquisition based on the useful lives historically prescribed to relevant assets per the applicable revenue determinations.
	Use of estimates No estimates have been required in the collation and presentation of this information.

Template 3.4 Operational data

Table 3.4.1: Energy delivery	**Consistency of information with the requirements of the RIN** The information provided is consistent with the requirement of the RIN in that the amount of electricity transported through the network has been taken from the downstream settlement location, and includes energy imported and exported over Basslink.

	Source of information Information has been sourced from TasNetworks' metering system, which captures energy supplied to other connected transmission networks, distribution networks and end-users. **Methodology and assumptions made** Energy supplied to other connected transmission networks over Basslink is measured on the Tasmanian side of the network for both imports and exports. Energy delivery to other connected transmission networks over Basslink is the sum of import energy and export energy. Energy supplied to distribution networks and directly connected end users and pumping stations is measured at the downstream settlement location which does not include transmission losses. Only energy export from the network is considered in calculating these energy supplied values, energy import is not considered. In the public version of the spreadsheet, TOPED0102 (to Distribution networks) keeps the value used in the confidential version. While TOPED0103 to TOPED0113 values are blacked out when there is either a single customer or a single dominant customer in the group. **Use of estimates** No estimates have been required in the collation and presentation of this information.
Table 3.4.2: Connection points	**Consistency of information with the requirements of the RIN** The information provided is consistent with the RIN in that connection point numbers have been reported as the average number of connection points on the first and last days of the regulatory year under system normal conditions. **Source of information** Information has been sourced from TasNetworks' metering system which contains details of all actual connection points. **Methodology and assumptions made** Generation connections have been considered as entry points. Directly connected customers, distribution connections and auxiliary loads have been considered as exit points. Basslink has been considered in the presentation of the connection point numbers as an exit point only, and not as an entry point. Previous year Boyer connection point, which provides a connection to a directly connected customer at 6.6 kV, was considered as two connection points (as Boyer 'A' and Boyer 'B' in line with metering process). To make a consistent approach on all the connection points, these two connection points are considered as a single connection point in this year. **Use of estimates** No estimates have been required in the collation and presentation of this information.
	Consistency of information with the requirements of the RIN

Table 3.4.3: System demand	Information reported has been determined in accordance with the definitions provided in the RIN in that the data presented represents weather adjusted maximum demand where required. **Source of information** Information has been sourced from TasNetworks' metering system which contains details of coincident and non-coincident maximum system demand by connection point measured at the low voltage side of the supply transformers. **Methodology and assumptions made** Basslink has been considered in the presentation of the coincident and non-coincident maximum transmission system demand information. The export through Basslink was added in the rest of the network demand. Coincident and non-coincident maximum system demand MVA information was calculated using metering data MW and MVAr of each connection point at each half hour and obtaining the maximum values. In calculating MVA, export MW and net MVAr (i.e. export MVAr – import MVAr) were accounted (square root of summation of MW squared and MVAr squared). The non-coincident MVA values are the summated maximum MVA of the connection points. Coincident and non-coincident MW and MVA calculation and weather correction are based on 1 April 2020 to 31 Match 2021 recorded maximum demand values instead of financial year values (i.e., regulatory year). The reason to consider that period is that the transmission network maximum demand occurs during winter and RIN definition for winter given for Category analysis is April to September. Weather data was obtained for the appropriate Bureau of Meteorology weather stations around the state. The weather correction process involves temperature sensitivity analysis at each connection point to determine the demand response to a change in temperature of one degree. Coincident and non-coincident weather adjusted maximum demand (MW and MVA) is derived based on the following methodology and assumptions: • historic daily maximum and minimum temperatures were obtained from the Bureau of Meteorology. Daily effective temperatures have been calculated in accordance with the definition provided by NIEIR, which is defined as the weighted average of the overnight minimum and the previous daily maximum. The daily minimum was assigned a weight of 0.8, while the previous day's maximum a weight of 0.2 in this calculation; • annual minimum effective temperatures in each season for the period from 1970 to current regulatory year were extracted from the calculated daily effective temperatures; • the temperatures at 10% and 50% probability of exceedance were derived from the annual minimum effective temperatures in each season for the period from 1970 to current regulatory year; • in weather correction of non-coincident maximum demand, each connection point maximum demand was weather corrected based on its closest weather station data; and • daily maximum demand has been taken from metering data and effective temperature data has been taken from previous calculations for weekdays for the current reporting period. The assumption has been made that Basslink flow, directly connected transmission customers and auxiliary loads are not dependent on weather, and these loads have not been forecast to change with the 10% or 50% probability of exceedance (**PoE**).

	Weather adjustments for each season have been done separately. December to February, March to May, June to August, and September to November are considered Summer, Autumn, Winter and Spring months respectively. The linear variation of daily maximum demand of each season against daily effective temperature was taken as demand sensitivity to temperature. In general Tasmanian demand goes up when temperature goes down in all seasons (even in Summer, maximum demand records in a low temperature day). If the linear relationship gives a positive coefficient, that coefficient is not used in the whether correction process and the coefficient is considered as zero. The difference between the PoE temperature and the lowest of the daily effective temperature or the historic maximum of annual lowest effective temperatures has been multiplied by the load sensitivity to determine the total change in demand for the probability of exceedance. Summation of weather correction maximum demand of each connection is taken as system non-coincident weather adjusted summated maximum demand. In calculating coincident weather adjusted maximum demand (MW and MVA), the procedure applied to connection point is used (i.e., linear variation of daily system maximum demand against temperature was taken as demand sensitivity to temperature). Temperature considered for this calculation is the weighted average temperature based on the load at that time. Average power factors were calculated over the financial year 2020/21, which is the regulatory year. Average overall network power factor conversion is the average total megawatts divided by average total megavolt-amperes. Average power factor conversion for 220 kV lines is the average total megawatts divided by average total megavolt-amperes of 220 kV connection points except Basslink. Average power factor conversion for lines is the average total megawatts divided by average total megavolt-amperes of connection points: • 110KV lines average of 110KV connection points; • 44KV lines average of 44KV connection points; • 33KV lines average of 33KV connection points; • 22KV lines average of 22KV connection points; • 11KV lines average of 11KV connection points; and • 6.6KV lines average of 6.6KV connection points.
	Use of estimates No estimates have been required in the collation and presentation of this information.

Template 3.5 Physical assets

Table 3.5.1: Transmission system capacities	**Consistency of information with the requirements of the RIN** Data has been reported on the quantities and capacities of physical assets. Data has been disaggregated into the overhead network, underground cable and transformers where necessary.
	Source of information Information regarding the circuit length measurements and continuous load ratings has been sourced from the SAP, and Ratings Information System (**RIS**), and corrected

for the transmission line projects completed in 2020/21 where SAP master data is incomplete.

Methodology and assumptions made

In determining the length of the overhead network circuits for table 3.5.1.1, information was extracted from SAP for the current reporting period, and for energised service status only.

The values for CA(T) table 2.2.2 were calculated with parallel lines counted separately, however the values for 3.5.1.1 were calculated with parallel lines counted as a single circuit, and, as such, the values in table 2.2.2 and 3.5.1.1 do not reconcile.

In determining the length of the underground cable circuits for table 3.5.1.2, information was extracted from SAP.

For tables 3.5.1.3 and 3.5.1.4, the weighted average MVA capacity was calculated from circuit rating and circuit length data from SAP, consistent with the definition provided in the RIN. The estimated average capacity used in the calculation for transmission lines was the maximum winter capacity. Only those overhead network and underground cable circuits owned by TasNetworks were included in the calculations, not those assets managed by TasNetworks but owned by third parties. The length of the overhead network and underground cable circuits has been taken from tables 3.5.1.1 and 3.5.1.2. Corrections have been made for sections of transmission circuits designed as 200kv but currently operated at 110kV. Cable MVA rating details are based on an engineering assessment of the manufacturer data and installation methods, and for new installations that are provided by the contractor for entering into SAP.

Transformer information was extracted from SAP and is the maximum continuous loading rating as detailed on name plate for table 3.5.1.5.

For the Basslink interconnector the available load details are in MWs. The power factor value detailed in table 3.4.3.3 (TOPSD0305) for 220 kV lines was applied to arrive at the MVA value reported in TPA0505 (interconnector capacity). The MW value (500MW continuous) was obtained from Basslink website (www.basslink.com.au) to give a total MVA of 520MVA.

In calculating transformer capacity for terminal points to Distribution Network Service Provider (**DNSP**) systems (TPA0502) we have included transformers supplying Hydro pump loads, and we have included transformers that supply a bus where that bus supplies both DNSP load and a direct-connected customer (Port Latta and Rosebery substations). That is, 100% of the transformer capacity is assigned to TPA0502, and none to TPA0503.

To assist with determining the transformer capacity for directly connected end–users owned by the TNSP (TPA0503) reference was made to TasNetworks' 'Transmission Customer Engagement' intranet portal to ascertain which customers TasNetworks has and which substation they are supplied from. Further confirmation was obtained using substation Power Circuit One Line Diagrams (**PCOLD**) or operational diagrams to ensure that the substations in question only had a direct connect customer as the single point load and no supply to the DNSP. The capacity for directly connected end-user assets owned by the end-user (TPA0504) was determined by first requesting confirmation from the Commercial Services team of specific customers for which TasNetworks has a connection agreement, and then aksing them to also provide the Connection Capability and power factor for each customer. This connection capability was used as a proxy for Transformer capacity. From this list we excluded those customers already counted under TPA0503.

For table 3.5.1.6, AMIS was interrogated for details of any listed spare assets.

Cold spare capacity is taken to be the continuous rating for all spare transformers (DCOM OPSP & DCOM STSP)

Use of estimates

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

Template 3.6 Quality of service

Table 3.6.1: Service component

Consistency of information with the requirements of the RIN

The information provided is consistent with the RIN in that the data reported is consistent with STPIS data unless otherwise stated.

Source of information

Information for table 3.6.1 is sourced from TasNetworks' Enterprise Resource Planning (**ERP**) System – SAP.

Methodology and assumptions made

The definition used for determining information is included in:

- AER - Final decision - Electricity STPIS version 5 - September 2015

3.6.1.1. In calculation of Number of defined circuits

"Any outage of an asset that is providing *prescribed transmission services*" is considered in the STPIS reporting. In SAP assets that are providing prescribed transmission services are tagged as "CRITICAL" and "NON-CRITICAL". Thus outages on other non-prescribed assets are excluded.

3.6.1.2. In calculation of System Minute

$$\text{System minute} = \frac{\Sigma\ (\text{MWh unsupplied} \times 60)}{\text{MW peak demand}}$$

MW peak demand means the maximum amount of aggregated electricity demand recorded at entry points to the *TNSP's* transmission network and interconnector connection points at any time previously

Use of estimates

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

Table 3.6.2: Market impact component

Consistency of information with the requirements of the RIN

The information provided is consistent with the RIN.

Source of information

Information for table 3.6.2 is sourced from AEMO data accessed via ez2view desktop application.

	Methodology and assumptions made The definition used for determining information is included in: • AER - Final decision - Electricity Transmission STPIS version 5 - September 2015
	Use of estimates No estimates have been required in the collation and presentation of this information.
Table 3.6.3: System losses	**Consistency of information with the requirements of the RIN** The information provided is consistent with the RIN. System losses are calculated by calendar year.
	Source of information Information is obtained from TasNetworks' national electricity market wholesale metering and billing system.
	Methodology and assumptions made System losses (TQS03) is calculated as in accordance with the RIN: $\frac{(Electricity\ inflows - electricity\ outflows) \times 100}{electricity\ inflows}$ where: • electricity inflows is the total electricity inflow into TasNetworks' transmission network including from generation, other connected TNSPs at the connection point, and connected DNSPs as measured by revenue meters; and • electricity outflows is the total electricity outflow into the networks of connected distribution network service providers, other transmission networks and directly connected end-users as measured by revenue meters.
	Use of estimates No estimates have been required in the collation and presentation of this information.

Template 3.7 Operating environment factors

Table 3.7.1: Terrain factors	**Consistency of information with the requirements of the RIN** Information has been provided regarding terrain factors in accordance with the definitions included within the RIN.
	Source of information Total number of vegetation maintenance spans information has been sourced from completed work orders which have been issued to vegetation management contractors. Average vegetation maintenance span cycle information has been sourced from the Vegetation Asset Management Plan.

	Average number of trees per vegetation maintenance cycle information has been sourced from completed work orders which have been issued to vegetation management contractors. The density of vegetation within the spans has been determined by: • using vegetation density data collected by contractors; and/or • viewing the spans via an online medium (e.g. Google Earth) and assigning a particular density to the vegetation in like areas (it is assumed that the vegetation densities assigned by TasNetworks align with those used by the contractors that collected similar data). To determine the average number of trees per maintenance span that are being actively managed, TasNetworks has incorporated both maintenance and inspection activities for the spans being maintained. TasNetworks has used data provided by Forestry Tasmania in quantifying 'Medium' vegetation density. Average number of defects per vegetation maintenance span information has been sourced from work orders, which include information as to whether a defect has been noted within a span. Structures that intersect with standard vehicle access roads within a nominated radius were identified with reference to TasNetworks' GIS. Span lengths were extracted from SAP. The altitude of each structure was extracted from the AMIS, which derives its altitude data for each tower from manually inputted data obtained through the analysis of contour maps. To determine the number of maintenance spans in bushfire risk areas, spans have been counted if they fall within the High Bushfire Loss Consequence Area (**HBLCA**) polygon developed for Tasmania.
	Methodology and assumptions made ***Total number of vegetation maintenance spans*** Information has been extracted from the Vegetation Management System (**VMS**) for partially completed and completed work orders. ***Average number of trees per vegetation maintenance span*** The average number of trees per vegetation maintenance span has been arrived at by multiplying the span length (for the span where the maintenance was completed) by the easement width, and by the determined density of vegetation within each of the spans (the 'density factor'). It has been assumed that all 110 kV transmission lines have an easement width of 50 metres, and 220 kV lines have a width of 60 metres. ***Average number of defects per vegetation maintenance span*** The majority of defects per vegetation maintenance span are grouped and recorded as a single defect if they occur, regardless of the number of defects within the span. It is assumed that the number of spans where multiple defects have been recorded is not material. ***Tropical proportion*** Based on the definition of Tropical Spans within the RIN and as defined by the Australian Bureau of Meteorology Australian Climate Zones Map, this is not applicable to Tasmanian vegetation. ***Standard vehicle access***

	A 10 metre radius was applied to each structure to determine if they intersect with standard vehicle access roads. Only those structures that are accessible all year round were included for the purposes of presenting this data. It has been assumed that if standard vehicle access is possible to a tower, then access to the span forward from that tower is also possible. It is this span length that has been counted. TasNetworks has previously reported this variable as the route line length not accessible to standard vehicles. ***Altitude*** For each structure that is installed at 600 metres above sea level or higher, the forward span length was counted to determine the Route Line Length. TasNetworks' altitude measurements have been made at the tower base. There may be a very small number of towers where the conductor attachment point is in excess of 600 metres, yet the tower base is below 600 metres. The structure and associated span forward would not be counted. ***Average number of trees per vegetation maintenance span*** The determined density factor has been broken down into four bands. The assumption of the number of trees in each band is (developed through an assessment of aerial photos for easements where vegetation maintenance has occurred): • Pasture = 5 trees per Ha • Low = 50 trees per Ha • Medium = 1300 trees per Ha (approximately equal to typical Forestry Tasmania plantation density) • High = 2000 trees per Ha TasNetworks does not currently have the asset information to take into account vegetation density variation due to changes in easement geography or vegetation height. Accordingly the quantities reported are all trees within the span rather than those which may require active management.
	Use of estimates No estimates have been required in the collation and presentation of this information.
Table 3.7.2: Network characteristics	**Consistency of information with the requirements of the RIN** Information has been provided regarding network characteristics in accordance with the definitions included within the RIN.
	Source of information The total route line length has been sourced from information maintained within SAP. Variability of dispatch information has been sourced from historical metering information. Concentrated load distance information has been sourced from the GIS. The total number of spans has been sourced from information maintained within SAP.
	Methodology and assumptions made

	Route line length Information was extracted from SAP. All assets maintained are included in the information presented. ***Variability of dispatch*** Variability of dispatch was determined with reference to historical metering information from Hydro, Wind, Gas and Diesel generation. The component of energy generated by renewable energy (hydro and wind powered stations) is expressed as a percentage of the total energy generated. ***Concentrated load distance*** Information has been extracted from the GIS. Sheffield Substation has been selected as the generation node and Greater Hobart as the load centre to meet the AER definition. ***Total number of spans*** The total number of spans has been has been extracted from the SAP. All assets maintained are included in the information presented.
	Use of estimates No estimates have been required in the collation and presentation of this information.

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