TasNetworks
Delivering your power

# Distribution Category Analysis Regulatory Information Notice, 2019-20

## Basis of Preparation

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# Introduction

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

This Basis of Preparation (**BoP**) forms part of the response of TasNetworks to the Regulatory Information Notice (**RIN**) issued in March 2014 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 category analysis.

The information and explanatory material included in this BoP relate to TasNetworks' activities as Tasmania's licensed Distribution Network Service Provider (**DNSP**) during the 2019-20 Regulatory Year (referred to throughout this document as the current reporting period).

# AER's Instructions

The AERs instructions in completing the category analysis 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

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| 1.2 (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:<br>(i) why an estimate was required, including why it was not possible to use actual information;<br>(ii) 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

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| AER | Australian Energy Regulator |
| Aurora | Aurora Energy Pty Ltd, acting in its capacity as the licensed DNSP in Tasmania prior to 1 July 2014 |
| Bravo | NMI consumption data storage and service order management systems |
| CAM | Cost Allocation Method |
| DM | TasNetworks' Electronic Document Management System |
| DNSP | Distribution Network Service Provider |
| Gentrack | TasNetworks' billing and market system (including customer and NMI management) |
| Gtech | Intergraph G/Technology geographic information system |
| HBLCA | High Bushfire Loss Consequence Area |
| MDMS | Meter Data Management System |
| MED | Major Event Day |
| Navision | TasNetworks' former financial system, which was replaced by SAP on 3 February 2017 |
| NOCS | Network Operations Control System |
| OTTER | Office of the Tasmanian Economic Regulator |
| Podium | TasNetworks' customer service platform |
| POW | Programme of Work |
| RIN | Regulatory Information Notice |
| 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 |
| WASP | TasNetworks' program-of-work management system (Works, Assets, Solutions and People). Retired 3 March 2018. |
| UG | Underground (cable ) |
| Telecommunications | Encompasses any telecommunications related asset |
| Secondary Systems | Encompasses protection systems, SCADA and Network Control |
| Substations Primary Systems | Encompasses power transformers, switchbays, transmission cables and reactive plant |
| Transmission Lines | Encompasses towers, support structures and conductors |
| 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. |

# Table of Contents

# Template 2.1 Expenditure summary & reconciliation

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| **Table 2.1.1: Standard control services capex**<br><br>**Table 2.1.2: Standard control services opex** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for the expenditure summary and reconciliation in accordance with the definitions and requirements of the RIN.<br>Total expenditure for capital expenditure (**Capex**) and operating expenditure (**Opex**) has been reported on an 'as-incurred' basis.<br>TasNetworks has reconciled total Capex and Opex with the sum of Capex and Opex line items in the 'balancing item' row of each table in Template 2.1 using a balancing item which has been calculated in line with the instructions set out in paragraph 2.3 of Appendix E to the RIN. |
| **Table 2.1.3: Alternative control services capex**<br><br>**Table 2.1.4: Alternative control services opex**<br><br>**Table 2.1.5: Dual function assets capex**<br><br>**Table 2.1.6: Dual functions assets opex** | **Source of information**<br>The summary information reported about standard control services Capex in Table 2.1.1 was sourced from tables 2.2 Repex, 2.3 Augex, 2.5 Connections data and 2.10 Overheads capitalised. The balancing lines include items sourced from the regulatory accounts that have not been included in the above tables.<br>The information in Table 2.1.2 Standard control services Opex by category was sourced from templates 2.7 Vegetation, 2.8 Maintenance, 2.9 Emergency Response, 2.6 Non-network data and Table 2.10 Overheads capitalised. The balancing lines include items sourced from the regulatory accounts that have not been included in the above tables.<br>The information in Table 2.1.3 Alternative control services Capex was sourced from templates 4.1 Metering and 4.2 Public lighting. The balancing items in Table 2.1.3 include alternative control services capitalised overheads identified during the process of responding to Template 2.10 (but not reported in that template).<br>The data reported in Table 2.1.4 Alternative control services Opex by category has been sourced from templates 4.1 Metering, 4.2 Public Lighting and 4.3 Fee-based Services. The balancing items in Table 2.1.4 include alternative control operating overheads identified during the process of responding to template 2.10 (but not reported in that template). Metering expenditure is included as part of overhead expenditure (as per AER instructions) and the balancing items have been reduced to take this into account. |
| | **Methodology and assumptions made**<br>In relation to Tables 2.1.5 and 2.1.6, TasNetworks has no dual function assets and, therefore, has reported no expenditure in these tables.<br>The expenditure reported in Template 2.6 Non-network has been included in operating overhead expenditure as well as non-network and, therefore, has been reduced in the balancing items. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 2.2 Repex

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| **Table 2.2.1: Replacement expenditure, volumes and asset failures by asset category** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for Repex in accordance with the definitions and requirements of the RIN in that:<br>• Where TasNetworks has provided asset sub-categories corresponding to the prescribed asset categories in Table 2.2.1, the asset replacement / asset failure volumes of these sub-categories reconcile with the higher level asset category<br>• Expenditure for each of the sub-categories is determined through prescribed unit rates, determined for each of the sub-categories<br>• In instances where the asset group categories and the sub-categorisation provisions set out in Table 2.2.1 do not account for an asset on TasNetworks' distribution system, TasNetworks has inserted additional rows below the relevant asset group to account for this and provided a corresponding age profile in regulatory template 5.2<br>• Replacement volumes by asset group are equal to the applicable replacement volumes provided in Table 2.2.2, with the exception of sub transmission assets. Subs transmission asset categories do not fall into any of the asset group metrics specified in Table 2.2.2<br>• Asset replacements reflect the quantity of store data from TasNetworks' financial systems for the current reporting period |
| | **Source of information**<br>Data was obtained from SAP, and data stored in the Spatial Data Warehouse. TasNetworks' outage management system (InService) was also used to source information relating to outages.<br><br>Asset failures for distribution substations (including Zone substations) was sourced from the Distribution Substation Asset Failure Register because the records in SAP are currently not mature enough to provide accurate asset failure reporting for these asset classes. |
| | **Methodology and assumptions made**<br>***General***<br>• TasNetworks identified the applicable Work Categories used in SAP that best represented Repex activities. Jobs falling into those Work Categories were then analysed within the various works tools, including TasNetworks' program-of-work management system (**WASP**), InService, SAP and WASP Outages.<br>***Poles***<br>• For pole replacements (i.e. renewals) and refurbishments, sources of data included:<br>  o all completed condition related pole renewals<br>  o pole refurbishments recorded in SAP<br>• The quantity reported for pole renewals and pole refurbishments are based on actual materials allocated through identified Repex work categories in SAP. Each piece of material used that correlates to an asset category has been classified as such, enabling the pole replacements arising as a result from other Repex drivers to be identified and counted, for inclusion in the count of replacements.<br>• For pole refurbishments, the staking of wooden poles and the reinstatement of steel / steel and concrete poles has been included. Steel and concrete pole reinstatements have been classified as concrete poles for the purposes of reporting. |

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| | • TasNetworks records tasks against each pole that requires renewal or refurbishment, and the data provided reflects tasks recorded in SAP for any work under the Repex work categories.<br>• TasNetworks has trialed and introduced spun concrete fibre reinforced composite poles for some critical support structure poles, especially in High Bushfire Loss Consequence Area (**HBLCA**). These are listed as "Other" in Asset Age Profile for Poles.<br>• "The condition-based replacement of poles is not deemed to constitute an asset failure, based upon the definition provided.<br>• TasNetworks records pole failures in its risk database, and a tabular record of Asset Inspector's Pole Failure Inspection Reporting for each unassisted pole failures is also stored in TasNetworks' Document Management System (**DM**). Unassisted pole failures are annually reported but are not reported in SAP as each suspected unassisted failure pole is forensically inspected by an Asset Inspector. The Asset Inspector submits a Pole Failure Inspection Report that is risk reviewed and recorded in the DM. The annual summary is submitted in RIN supporting references. The annual tally of unassisted pole failures is an important internal and internetwork benchmark for risk comparison, and for identifying dynamics in risk trends in pole failure in the population.<br>• Where an unassisted pole failure is also a staked pole, it is recorded as a staked failure and a pole failure.<br>• For the breakdown of voltages for poles replaced by other drivers for Repex, the voltage has been assumed based on the ratio of other poles.<br>• Pole number cluster at 1951 noted.<br>• A few poles or line support structures with unknown installed date included at assessed age rather than left out.<br>• Poles without installation dates include non- wood poles inherited from other organisations by restructure/amalgamations, and some emergency restorations after major historic bushfire events, using natural untreated poles felled nearby.<br>***Pole top structures***<br>• TasNetworks has a replacement program for pole-top hardware – principally cross arms. A large majority of pole-top hardware is changed at the time of a crossarm replacement.<br>• A summary of warehouse data has been extracted from TasNetworks' financial systems, and then linked to the relevant RIN categories, based on the asset material description.<br>• TasNetworks has reported outages where pole-top hardware has failed and requires replacement. The outage categories reported for pole-top structure failures are:<br>o Cross arm deteriorated (includes rot and corrosion)<br>o Cross arm broken<br>• Any replacement with a cause listed which suggested that the pole-top structure had failed to perform its critical function based on condition was included.<br>• All rot failures where no equipment has been linked is assumed to be a LV cross arm since timber cross-arms are only used in the LV network.<br>• Warehouse and outage data have been cross-checked to determine the number of crossarm failures, to reduce reporting limitations of both data repositories.<br>• A process of capitalisation of the Opex costs for materials against this fault work is undertaken monthly as a way to capitalise the replacement of failed components with new.<br>• Outages where the voltage is undeterminable have been distributed across the voltage levels utilising a ratio (proportional) split. The ratio calculation utilises the replacements where the voltage is identifiable. |

***Overhead conductors***

- A summary of stores data has been extracted from TasNetworks' financial systems, and then linked to the relevant work categories in SAP. As there is no reliable link between asset data and works data, the route length and number of phases involved with each work package cannot be easily attained. For the relevant work packs, the total of the conductor lengths has been used to calculate the length in the Repex table, and the values divided by 3 and converted to km to determine the total km installed. These values have been distributed across voltages matching that for the poles system voltage rating, and ratio of multiphase, single phase and Single Wire Earth Return (**SWER**).
- Conductors are repaired in the majority of cases, and then programmed for replacement, if required, as part of a program for replacement (Copper and Galvanised Iron conductor (GI)). The types of failures reported are:
  - Conductor clashing due to wind long span
  - Conductor clashing due to wind slack span
  - Conductor - Bare Wire Broken
  - Conductor low - Incorrect clearance
- The total conductor used from TasNetworks' stores system has been divided by 3 to calculate the total kilometres installed, based on the assumption that all overhead conductor installations are three phase.
- It is assumed that the majority (≈87.5%) of installations are 22kV, with a smaller proportion (≈12.0%) being 11kV conductors and a very small number being LV (≈0.05%). This proportion is based broadly upon voltage distribution across the State where this work has taken place. From a pole top/construction perspective, voltage makes very little difference in terms of the materials used, as the same components are used for both 22kV and 11kV voltages.
- For conductor failures, it has been assessed that all transformer outages are at LV conductor level and that others relate to voltage of feeder (HV). Conductor replacements with no recorded voltage level involve 22kV conductors on the basis that a large majority are 22kV.
- LV services spans are reported with overhead services, so excluded from LV overhead conductor report.

***Underground cables***

- Repex work of underground cables uses summary data extracted from TasNetworks' financial systems, and then based on the material description is allocated to the appropriate RIN category:
  - Underground cable replacement volumes are in kilometres.
  - Underground cable replacement is based on material posting date.
- Cables are repaired in the majority of cases and then programmed for replacement if required as part of a program for replacement. The type of failures reported are:
  - UG Cable Failure.
  - UG Joint Failure.
  - UG Cable Termination Failure(s)
- Asset Failure(s) are recorded based on number of events.
- All transformer outages are at LV level, whilst others relate to the voltage of the feeder.
- Underground cables defined by feeder type excludes subtransmission feeders from the calculation.
- Asset volumes currently in commission are calculated by summing the HV cable length for each feeder classification. The unknown and LV cable lengths are distributed using a calculated ratio split.

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| | • For cable / termination failures, those reported outages where the voltage reported is 'blank', will be distributed mainly across 22kV principally because a large majority are 22kV.<br>***Service lines***<br>• Volumes of replacements are determined through SAP materials list for Repex RIN categories. This outputs the volume in length (m) used for each job. The average service length is used to estimate the number of services that have been replaced based on the length of conductor used.<br>• Due to the commencement of a proactive replacement program, the total replacements is the sum of failures and replacements.<br>• Residential / Commercial and Industrial split is assumed to be 85/15, based on the ratio of customer types.<br>• High voltage relates to feeders and is not relevant to service lines. 'Blank' will be included in the total count.<br>• TasNetworks has no other services connection types at other voltages, as they are deemed part of the network, or relate to consumer mains (private).<br>• Data concerning service line failure and replacement was extracted from SAP. This data output is in the form of conductor length (m) so average service length is used to determine the number of individual services.<br>• Residential / Commercial and Industrial split is assumed to be 85/15, based on the ratio of customer types.<br>***Transformers***<br>• TasNetworks has a replacement program for transformers, HV and LV switchgear and substations. The data provided in this section is for the functional areas relating to those replacement programs.<br>• For overhead transformer replacements a summary of warehouse data has been extracted from TasNetworks' financial systems, and then linked to the relevant RIN categories, based on the asset material description.<br>• The feeder voltage is provided for the voltage breakdown. For transformer failures, the voltage is determined from the material description for the asset in TasNetworks' financial systems.<br>• Data concerning overhead transformer failures was extracted from the inService database.<br>• Overhead transformer replacements volumes are the total of replaced plus failures.<br>***Switchgear***<br>• TasNetworks has specific programs for the replacement of ground mounted and overhead switchgear units.<br>• Switchgear is reported per pole top. This means that where multiple fuses exist on a single pole-top, these are treated as the one switch and are replaced together as per the asset management plan.<br>• Where ground mounted switchgear is replaced and the solution is a complete kiosk substation, although the kiosk also contains a transformer, all the expenditure is accrued on the switchgear replacement Repex program. This is because the replacement equipment is a singular unit and the expenditure could not be split up and distributed over several Repex programs.<br>• For overhead switchgear replacements, a summary of warehouse data has been extracted from TasNetworks' financial systems, and then linked to the relevant RIN categories, based on the asset material description.<br>• For overhead switchgear, defect notification data from SAP was used to map the primary and secondary causes for the jobs where switchgear materials had left the |

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| | warehouse (from extract in above dot point) under emergency/fault to determine fuse failures.<br>• For failed units, TasNetworks has reported all outages where the outage cause is classified as switchgear and allocated to switchgear type, based on the Geographical Information System (**GIS**) asset description. This count does not differentiate between an asset failure that would result in a Capex asset replacement or an asset component failure that would result in an opex replacement such as replacing a fuse tube.<br>• Note that 22kV FUSEs are included under an additional category in the Repex spreadsheet.<br>• An operated fuse is not counted as a failed fuse in this analysis since the fuse link is not assumed to be an asset. The number of failed fuses was determine by summing the W/Os where a fuse link has been purchased if it has a condition based root cause listed for the failure (e.g. deterioration). This is because we have found this is the best way to detect that a W/O has been created for a condition based failure. Note that where it is likely that additional materials are booked out (such as the fuse holder), these won't be counted twice since we are only considering 'count of W/O'.<br>• Distribution polemounted switchgear assets share tally reported in some reporting categories with groundmounted switchgear. As the HV Network is about 80% 22kV and 20% 11kV a footnote is added to record both, such as in the case of HV EDO's.<br>***Public lighting***<br>• Public lighting data has been sourced from stores data for materials recorded in TasNetworks financial systems. The data from the financial systems was assigned to the relevant public lighting categories for faults and replacements. Volumes of faults in table 2.2.1 are not a subset of total replacements in the same table.<br>***SCADA, network control and protection systems***<br>• The financial data in Table 2.2.1 has been apportioned across categories using financial information for that year and the volumes of replacements. Protection schemes and SCADA systems for zone substations and building substations are sourced from SAP. SCADA systems for pole mounted switches, regulators, kiosk substations and fault indicators have been sourced from field staff records and validated with Network Operations Control System (**NOCS**) communications connections.<br>• Field devices include SCADA systems in zone substations, SCADA control in pole mounted reclosers, protection schemes in zone substations and protection schemes in building substations. However pole mounted recloser protection is excluded due to inadequate data. SCADA control of regulating transformers, kiosk substations, and fault indicators has been included this year.<br>• Replacement of SCADA systems and protection schemes are identified from the installation date of the equipment. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |
| **Table 2.2.2: Selected assets characteristics** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for repex in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>• TasNetworks financial systems<br>• Spatial data warehouse<br>• Table 2.2.1 of the RIN |

- Worksheet 5.2 of the RIN
- GTech
- SAP

## Methodology and assumptions made

***Methodology and assumptions in general***

***Poles***

- Feeders have been classified for the purposes of Table 2.2.2 as per the classification of feeders undertaken for TasNetworks' response to the current Annual Reporting RIN.
- Feeders were classified by applying the AER's feeder categorisation rules of:
    - Urban: Maximum demand of the feeder divided by the total length of the feeder is greater than 0.3 MVA/km
    - Short Rural: Maximum demand of the feeder divided by the total length of the is less than or equal to 0.3 MVA/km and the total length of the feeder is less than or equal to 200 km
    - Long Rural: Maximum demand of the feeder divided by the total length of the feeder is less than or equal to 0.3 MVA/km and the total length of the feeder is greater than 200 km
- Feeders for which there was no maximum demand available were manually assessed for classification based on their location and the classification of other feeders connected to the same substation.
- The asset volumes reported for table 2.2.1 have then been split by feeder classification (as per the AER's definitions) based on the feeder associated with each pole. Poles with no recorded feeder attribute have been distributed proportionally across feeder categories.
- The AER has made no provision in the RIN template for sub-transmission poles. Therefore, the total volume of poles reported in Table 2.2.2 will be less than the total number of poles reported in Template 5.2 Asset Age Profile.
- The asset volumes currently in commission have been determined through spatial analysis, where feeders were attributed to all poles. Poles with no recorded feeder attribute were distributed proportionally across feeder categories.

***Overhead conductors by feeder type***

- Overhead conductor replacement volumes are determined from the values submitted in Table 2.2.1. The asset volumes currently in commission have been provided principally from Template 5.2 Asset Age Profile.
- In the case of HV feeders, asset volumes have then been split by feeder classification (as per the AER's definitions) based on the feeder associated with each conductor. TasNetworks does not record a feeder attribute for LV conductors. Therefore, in the case of low voltage conductors, and any high voltage conductors with no recorded feeder attribute, those conductors have been distributed proportionally across feeder categories based on the classification of high voltage conductors.
- This template does not allow for sub-transmission feeders, meaning that high voltage conductor volumes do not reconcile with those reported in Template 5.2.

***Overhead conductors by material type***

- HV overhead conductors were split by material based on the conductor material recorded in GTech or SAP. However, TasNetworks' GIS does not currently record the material of low voltage conductors. Therefore, the split of low voltage conductors between materials was based on an extrapolation of records of low voltage conductor type connected to poles in SAP. The number of low voltage spans was assumed to be the number of poles minus 1. The average span length was then applied to the conductor materials to estimate the total length of low voltage conductors by

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| | conductor material. Low voltage spans with no conductor material were proportionally distributed across the low voltage conductor population.<br>• Template 2.2.2 does not allow for the reporting of copper conductor, so asset volumes will vary between conductor volumes by feeder classification and conductor volumes by material.<br>***Underground cables***<br>• Underground cable replacement volumes are as submitted in Table 2.2.1. The asset volumes currently in commission have been provided principally from Template 5.2 Asset Age Profile.<br>• High voltage underground cables asset volumes have then been split by feeder classification (as per the AER's definitions) based on the feeder associated with each underground cable. TasNetworks does not record a feeder attribute for low voltage underground cables. Therefore, in the case of low voltage cables, and any high voltage underground cables with no recorded feeder attribute, those cables have been distributed proportionally across feeder categories based on the classification of high voltage cables.<br>• This template does not allow for sub-transmission feeders, meaning that high voltage cable volumes do not reconcile with those reported in Template 5.2.<br>***Transformers by total MVA***<br>• Transformer replacement volumes were sourced from SAP.<br>• For cells corresponding to rows 'Total MVA replaced' and 'Total MVA disposed of' with column heading 'Asset volumes currently in the commission' the total installed transformer MVA was reported.<br>• For the cell corresponding to row 'Total MVA replaced' with column heading 'Asset replacements' the total transformer replaced MVA was reported.<br>• For the cell corresponding to row 'Total MVA disposed of' with column heading 'Asset replacements' the total transformer MVA disposed of was reported. Disposed transformers are those transformers removed from service and not reused on the network. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 2.3 Augex project data

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| **Table 2.3.1: Augex asset data – Subtransmission substations, switching stations and zone substations** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for augmentation projects in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>• SAP<br>• TasNetworks financial systems<br>• Schematic diagrams of TasNetworks substations<br>• Project scope documents |
| | **Methodology and assumptions made**<br>• Project expenditure has been reported in the regulatory year nominal dollars. |

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| | • Zone substation development utilise the work category codes CAZNC, CAZSU, LANDZ and EASEZ. Work programs relating to subtransmission work specifically is extracted from these codes and removed from the zone substation specific data.<br>• This data is examined for jobs exceeding $5 million completed in the regulatory year.<br>• Any jobs completed for a total cost less than $5 million are reported as non-material.<br>• Any jobs which do not have a project close date but have costs incurred against them under these work category codes are listed as non-material forecast. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |
| **Table 2.3.2: Augex asset data – Subtransmission lines** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for augmentation projects in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>• TasNetworks program of works management system<br>• TasNetworks financial systems<br>• Schematic diagrams of TasNetworks substations<br>• Project scope documents |
| | **Methodology and assumptions made**<br>• Project expenditure has been reported in the regulatory year nominal dollars.<br>• Subtransmission augmentations utilise the work category codes CAZNC, CAZSU, LANDZ and EASEZ. Work programs relating to subtransmission work specifically is extracted from these codes.<br>• This data is examined for jobs exceeding $5 million completed in the regulatory year.<br>• Any jobs completed for a total cost less than $5 million are reported as non-material. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |
| **Table 2.3.3: Augex data – HV/LV feeders and distribution substations** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for augmentation projects in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>• The data reported in Tables 2.3.3.1 and 2.3.3.2 has been sourced from TasNetworks' financial and Works Management systems.<br>• The numbers of circuit kilometres and distribution transformers added during the reporting period have been obtained from TasNetworks' financial and Works Management systems. |
| | **Methodology and assumptions made**<br>• No information relating to gifted assets has been included. |

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| | • Information regarding augmentation (capital) expenditure has been reported on an as incurred basis and in nominal dollars<br>• information regarding the circuit line lengths of HV and LV feeders and the number of substations added has been provided on an as incurred basis.<br>• Data was extracted from the source systems based on specified Work Categories and identified by Overhead and Underground project types<br>• Data was summarised based on High and Low voltage conductor types and Substation types based on the data extract.<br>• Expenditure recorded in Table 2.3.3.2 includes all projects undertaken during the regulatory year, not just completed jobs. The assets added or in service as an outcome of projects that were not complete as at the end of the current reporting period have not been included in the totals reported in Table 2.3.3.1.<br>• The total cost thresholds applied to delineate between material and non-material high voltage and low voltage feeder augmentation projects are $500k and $50k respectively. The thresholds have been applied against the total cumulative expenditure over the life of the project, inclusive of any indirect costs. Expenditure reported in Table 2.3.3.2, however, excludes overheads.<br>• Functional areas for reporting in this table have been derived from augmentation-related activities which comprise the following functional area codes: CAHVF, CALVF, PQLVV, PQTXV, PRHVR, CATXU.<br>• Customer connection information is not included in this table.<br>• Upgraded units are classed as replacement of existing units for augmentation purposes. Added units are classed as new units for augmentation purposes. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

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| **Table 2.3.4: Augex data – Total expenditure** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for augmentation projects in accordance with the definitions and requirements of the RIN in that:<br>• Information regarding augmentation expenditure has been reported on an as incurred basis and in nominal dollars<br>• Expenditure relating to land purchases and easements associated with augmentation works on high voltage feeders, low voltage feeders and distribution substations has only been provided in Table 2.3.4<br>• Expenditure recorded in the 'Land and easements' rows of Table 2.3.4 has not been included in the augmentation expenditure reported in relation to the corresponding asset groups in the same table. |
| | **Source of information**<br>• SAP<br>• TasNetworks financial systems |
| | **Methodology and assumptions made**<br>• TasNetworks' augmentation expenditure has been extracted from TasNetworks' financial systems by relevant work category, and aggregated to the corresponding asset groups.<br>• The expenditure reported in Table 2.3.4 in relation to Subtransmission Substations, Switching Stations, Zone Substations and Subtransmission Lines is as incurred, whereas expenditure reported in tables 2.3.1 and 2.3.2 is consistent with requirement to report expenditure on a project close basis. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 2.5 Connections

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| **Table 2.5.1: Descriptor metrics** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for connections in accordance with the definitions and requirements of the RIN in that:<br>• No information relating to gifted assets has been included;<br>• Information regarding augmentation (capital) expenditure has been reported on an as incurred basis and in nominal dollars (of the relevant regulatory year);<br>• Information regarding the circuit line lengths of HV and LV feeders and the number of substations added is provided on an as incurred basis;<br>• The GSL data provided pertains to Customer Charter payments made to residential customers only |
| | **Source of information**<br>***Augmentation (all sub categories)***<br>The information regarding augmentation in Table 2.5.1 has been sourced from SAP and the Managing Customer Connections (MACCs) database. |

***Underground and overhead connection volumes (Residential, Commercial / Industrial Connections)***

The volumes of underground and overhead connections were determined on the basis of information stored in the Bravo (SOM) system. Nb - these volumes do not exclude any Embedded Generation connections.

***Distribution Substation Installed***

Distribution substations MVA added and number installed have been calculated by extracting the transformer size and quantities from the TasNetworks' financial system (SAP) and quantities that were extracted for customer connection functional areas.

***Distribution Substation Installed***

Expenditure data has been sourced from TasNetworks' financial system and reconciled to the Annual Reporting RIN.

***Mean days to connect residential customer with LV single phase connection (residential connections)***

The mean days taken to connect residential customers requiring a low voltage single phase connection was derived using a combination of service order information originating from the Bravo (SOM) system.

***GSL breaches for residential customers (residential connections)***

The volumes and values of payments made under the customer charter applying in the current reporting period to connections to customers who received a standard of service below that set out in the charter have been derived from the service order management tool Brave that are reviewed and processed in in the Charter Payment Tool. The data used for these calculations comes from the Charter Payment Tool.

***Volume of customer complaints relating to connection services (residential connections)***

The volume of complaints applying to connection services has been derived from records kept in The Podium.

***GSL payments (residential connections)***

The number and value of payments made to customers who received a standard of service below that set out in the customer charter in the current reporting period have been derived from records kept in the Charter Payment Tool.

***Subdivision connections***

The data reported in Tables 2.5.1 and 2.5.2 has been sourced from TasNetworks' financial and Works Management systems.

***Embedded generation connections***

The data reported in Tables 2.5.1 and 2.5.2 has been sourced from TasNetworks' financial, Works Management, Bravo (SOM) and Gentrack systems.

## Methodology and assumptions made

***General***

- The volume of complaints applying to connection services has been derived from records kept in The Podium for residential customers – Subject Level 1 Connections, Subject level 2 EWR Related Work and Network Customer Supply
- Expenditure on all types of connection related activities reported in Table 2.5.1 has been allocated to the different classifications and subcategories using the functional areas in TasNetworks' financial systems.
- Information regarding the circuit line lengths of HV and LV feeders and the number of substations added on an as incurred basis.
- 'Net circuit km added' refers to the circuit line length based on materials as incurred;
- TasNetworks is not obliged under a jurisdictional scheme to make payments to customers for connections. The amounts reported are voluntary payments made by

TasNetworks in recognition of a breach of our customer charter. These payments are reported based on the date the payment was made not the qualifiying date.

***Distribution substation installed***

Expenditure has been allocated to the different classifications and subcategories using the functional areas in TasNetworks' financial systems.

For embedded generation distribution substations installed, no transformer materials were incurred against the specified functional areas for embedded generation connections. The methodology was to search for work order descriptions among the customer functional areas which contained the word "Solar". This narrowed down the search and the embedded generation connections with distribution substations installed was manally extracted from the specified sheet in the working document. The same approach was taken for augmentation work on the LV and HV network.

***Mean days to connect residential customers with LV single phase connection***

The mean days to connect residential customers with a low voltage single phase connection has been derived using Brave Service Order Management records of the date on which service orders for connections of this type are received in the field and the corresponding job completion dates. The service orders are generated by SOM and exported into TasNetworks' field tool, which is also used to gather the completion date for each job as part of standard operating procedure.

***Augmentation (all subcategories)***

- Augmentation volumes were sourced from SAP under the relevant functional areas across the following connection types:
  - Residential connections
  - Commercial/industrial connections
  - Subdivisions
- Subdivision lots are based on the Works Order description where it exists, or the drawing, or is determined from the materials used.
- Embedded generation SOLAR connections projects were identified in Gentrack and the MACCs database.
- The number of high voltage embedded generator projects have been identified by the relevant TasNetworks' Asset Manager using SAP as the source.

***Embedded Generation***

The number of embedded generation connections were obtained from the Bravo (SDR) system, which holds a local copy of MSATS standing data. The methodology used was to identify the number of NMIs that were not recorded with TASX (i.e.: embedded generation) network tariffs prior to the targeted financial year but were recorded with TASX network tariffs during the targeted financial year.

***Overhead / Underground Connections***

Where this information has not been provided, the null or blank values will be proportioned to the OH/UG categories based on percentages of the known values.

## Use of estimates

No estimates have been used in the collation and presentation of this information.

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| **Table 2.5.2: Cost metrics by connection classification** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for connections in accordance with the definitions and requirements of the RIN in that:<br>• TasNetworks has reported expenditure data as gross amounts, and has not subtracted customer contributions from the connections expenditure data<br>• TasNetworks has applied the definitions of complex connections in Appendix F of the RIN to provide guidance on the type of work which is to be reported as connection services for the purposes of Table 2.5.2, as opposed to augmentation (reported under Template 2.3)<br>• Only augmentation expenditure relating to connections provided in response to customer connection requests has been reported in regulatory Template 2.5<br>• The costs associated with the provision of connection services has been reconciled to the Annual Reporting RIN. |
| | **Source of information**<br>• The costs associated with the provision of connection services have been sourced from TasNetworks' financial systems and reconciled to the Annual Reporting RIN.<br>• The volume data reported in Tables 2.5.2 has been sourced from TasNetworks' financial and Works Management systems. |
| | **Methodology and assumptions made**<br>***Financial***<br>In relation to the provision of connection services, TasNetworks' financial systems does not distinguish between the connection classifications used in Table 2.5.2 (i.e. simple and complex LV or HV connections).<br>In order to report the costs associated with each type of connection classification stipulated in Table 2.5.2, the total cost of providing connection services in the current reporting period has been apportioned between the classifications in Table 2.5.2 on the basis of unit rates developed specifically for the purposes of weighting the connection volumes reported in Table 2.5.2.<br>***Residential – Complex Connection HV***<br>Number of completed residential connections requiring HV cable/conductor and/or a distribution substation.<br>***Residential – Complex Connection LV***<br>Number of completed residential connections not requiring HV cable/ conductor and/or a distribution substation.<br>***Residential – Simple Connection LV***<br>This is the balance after deducting the values for Complex Connections LV and HV from the total of Residential Underground and Overhead in table 2.5.1.<br>***Commercial/Industrial – Complex Connection HV (Customer connected at HV)***<br>Number of completed commercial/industrial connections by requiring a HV circuit breaker.<br>***Commercial/Industrial – Complex Connection HV (Customer connected at LV,minor HV works)***<br>Assume all "complex connection HV (customer connected at LV)" connections requires upstream work as the work orders cannot differentiate between minor or major works. |

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| | ***Commercial/Industrial – Complex Connection HV (Customer connected at LV,upstream asset works)***<br>Number of completed commercial/industrial connections not requiring a HV circuit breaker. Assumes all connections require upstream asset works.<br>***Commercial/Industrial – Simple Connection LV***<br>This is the balance after deducting all values for Complex Connections HV from the total of Commercial/Industrial Underground and Overhead in table 2.5.1<br>***Subdivision – Complex connection LV***<br>Number of completed lots that do not require HV cable/conductors.<br>***Subdivision – Complex Connection HV***<br>Number of completed lots that required HV cable/conductors. Assumes all Complex connections HV have upstream asset works.<br>***Embedded Generation – Simple Connection LV***<br>This is the balance after deducting all values for Complex Connections HV from the total of Embedded Generation Underground and Overhead in table 2.5.1<br>***Embedded Generation – Complex Connection HV (small capacity)***<br>Number of completed embedded generation connections <= 22kV (i.e. HV/LV). Sourced data from SAP with materials incurred against completed work orders that were of the type 'RECLOSER,Auto'<br>***Embedded Generation – Complex Connection HV (large capacity)***<br>Number of completed embedded geneneration connections > 22 kV (i.e. subtransmission). Sourced data from SAP with materials incurred against completed work orders that were of the typr 'RECLOSER,Auto'. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 2.6 Non-network expenditure

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| **Table 2.6.1: Non-network expenditure** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for non-network expenditure in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>• SAP<br>• Fleet Reports |
| | **Methodology and assumptions made**<br>***IT and Communications***<br>• Client device expenditure is expenditure that relates to a hardware device that accesses services made available by a server. Items included in this category are the costs associated with our IT service provider, plus all capital expenditure associated with the purchase of desktop computers, laptops, tablets etc.<br>• Recurrent expenditure is expenditure that relates to items that occur on a regular on-going basis and would include the operating labour costs of the IT department, plus all |

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| | costs associated with landlines, mobile phone charges, software, data communications etc.<br>• Non-recurrent expenditure is expenditure that relates to items that occur on a non-recurring basis.<br>***Motor vehicles***<br>• All motor vehicles are split into the relevant RIN category per the category designation generated from SAP. Costs are then allocated on a proportionate basis per the number of vehicles within each category for determining opex expenditure. Capex expenditure is the value of additions within the regulatory year, split into the relevant motor vehicle category. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |
| **Table 2.6.2: Annual descriptor metrics – IT and communications expenditure** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for non-network expenditure in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>The descriptor metrics relating to TasNetworks' IT and Communications expenditure has been sourced from SAP at the time of the Financial Year End. The numbers provided are as per the TasNetworks' published accounts. |
| | **Methodology and assumptions made**<br>Employee numbers represent total TasNetworks employee numbers as published in the annual accounts. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |
| **Table 2.6.3: Annual descriptor metrics – Motor vehicles** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for non-network expenditure in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>• SAP<br>• Fleet Reports |
| | **Methodology and assumptions made**<br>***Kilometres travelled***<br>The opening and closing odometer readings for each vehicle were used to calculate the kilometres travelled in the current reporting period, with the mileages then sorted by category of vehicle and aggregated.<br>***Number purchased***<br>The number of vehicles purchased by TasNetworks during the current reporting period was extracted from SAP. |

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| | ***Proportion of expenditure***<br>• The proportion of fleet expenditure was derived by:<br>  ○ gathering motor vehicle expenditure for each vehicle from TasNetworks financial system.<br>  ○ allocating each motor vehicle to the appropriate category (e.g. Light Commercial, Passenger, Trailer)<br>  ○ calculating the total expenditure for each category of motor vehicle<br>  ○ splitting out the cost of each category of vehicle by service classification<br>  ○ calculating the Regulatory Percentage by dividing standard control expenditure by total expenditure |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 2.7 Vegetation management

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| **Table 2.7.1: Descriptor metrics by zone** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for vegetation management in accordance with the definitions and requirements of the RIN.<br>***Vegetation management zones***<br>Under paragraph 12.1 in section 12 of Appendix E to the RIN (Principles and Requirements), TasNetworks is required to nominate one or more vegetation management zone(s) across the geographical area of TasNetworks' distribution network.<br>TasNetworks has nominated two vegetation management 'zones' in accordance with Appendix E. In doing so, TasNetworks has taken into consideration the areas where bushfire mitigation costs are imposed by legislation, regulation or Ministerial order, as well as areas of the network where other recognised drivers affect the costs of performing vegetation management work.TasNetworks is required to provide, on separate A4 sheets, maps showing each vegetation management zone and the total network area with the borders of each vegetation management zone. Those maps have been provided as required, and are also reproduced below.<br>For each vegetation management zone identified, TasNetworks has provided details of any regulations that impose a material cost on performing vegetation management works, including, but not limited to, bushfire mitigation regulations.<br>Details of the self-imposed standards from TasNetworks' vegetation management program which apply to each nominated vegetation management zone have also been provided as part of this Basis of Preparation document.<br>Operationally, TasNetworks' entire network is managed as a single vegetation management zone, which reflects the fact that the entire distribution network is covered by TasNetworks' normal trimming cycle. Within that zone, however, a HBLCA has been defined to identify the area of TasNetworks' network where bushfire mitigation is a recognised driver of additional vegetation management work.<br>Zone 2 has been nominated as the area within the HBLCA, whilts Zone 1 is nominated as the area outside the HBLCA.<br>TasNetworks carries out an annual pre-summer vegetation inspection and cutting program in the HBLCA to ensure required clearances are achieved prior to the onset of the annual bushfire season.<br>Tree-trimming costs have been split between zones in the vegetation expenditures table (Table 2.7.2). |

The definition of the HBLCA is flexible, however, and can change between years, in that TasNetworks has the option of extending the area covered by its pre-summer inspection and cutting program if conditions leading into the bushfire season pose sufficient risk to warrant additional work being undertaken. Such risks and additions to the program are developed in consultation with the Tasmania Fire Service and the Bureau of Meteorology.


**Figure 1 – High bushfire loss consequence area**

Legislation with a material impact on vegetation management work

The following legislation requires TasNetworks to implement programmes relating to vegetation management:

*Electricity Supply Industry Act 1995* (**ESI Act**)

*Electricity Industry Safety and Administration Act 1997* (**ESI&A Act**)

The *Tasmanian Electricity Code* (**TEC**)

TasNetworks' normal trimming cycle across the state are driven by compliance with the ESI Act, the ESI&A Act and Chapter 8A of the TEC. TasNetworks uses the principles and approaches contained within Chapter 8A of the TEC as its basis for managing the vegetation within TasNetworks' statutory easements.

*Electricity Supply Industry Act 1995*

The ESI Act exists to:

- promote efficiency and competition in the electricity supply industry
- establish and maintain a safe and efficient system of electricity generation, transmission, distribution and supply
- establish and enforce proper standards of safety, security, reliability and quality in the electricity supply industry

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| | • protect the interests of consumers of electricity<br>The ESI Act covers safety aspects at a fairly high level and is implicit regarding vegetation management risks.<br>*Electricity Industry Safety and Administration Act 1997*<br>The EIS&A Act exists to establish safety standards for electrical articles, to provide for the investigation of accidents in the electricity industry and for related purposes. The ESI&A Act covers:<br>• Powers of entry and inspection<br>• Powers to order rectification<br>• Powers to order disconnection<br>Emergency powers relevant to TasNetworks vegetation management activities<br>*Tasmanian Electricity Code*<br>The TEC provides, inter alia, a statement of the relevant technical standards of the electricity supply industry, an access regime to facilitate new entry, guidance on price setting methodologies, a means of resolving disputes, and establishes advisory committees to assist the Regulator. There has been on-going development and refinement of the TEC to ensure that it best meets the needs of the Tasmanian electricity supply industry and customers.<br>Chapter 8A of the TEC includes a framework for the management of vegetation around distribution powerlines. This framework is explicit regarding works requirements and practices in various fire hazard categories.<br>TasNetworks has the regulatory responsibility to manage trees growing near power lines and mitigate risks associated with trees coming into contact with power lines. The minimum standard to which TasNetworks must achieve is compliance with Chapter 8A of the TEC.<br>***Self-imposed Vegetation Management Standards***<br>Vegetation management works in the HBLCA include the standard cyclic cuttings undertaken in the rest of the State, as well as a more rigorous annual pre-summer vegetation inspection and cutting programme to ensure required clearances are achieved prior to the onset of each annual bushfire season.<br>The HBLCA was originally developed as part of Aurora Energy's 2012 Bushfire Mitigation Strategy (which has been adopted by TasNetworks), where leading experts from Melbourne University and the Tasmanian Parks and Wildlife Service were engaged (in consultation with the Tasmanian Fire Service) to utilise the industry accepted Phoenix Rapid-fire modelling tool to determine areas of fire loss consequence. This methodology has been utilised by other DNSPs following the findings of the Victorian Bushfire Royal Commission.<br>The HBLCA was reviewed and updated during 2018 and is described further within TasNetworks' Bushfire Risk Mitigation Plan (2018).<br>The level of exposure to bushfire risk has been determined based on the number of maintenance spans located in the HBLCA.<br>TasNetworks has the option of extending the area covered by the pre-summer vegetation inspection and cutting programme if conditions leading into the bushfire season pose sufficient risk to warrant additional work being undertaken. Risk and additions to the programme are discussed in liaison with the Tasmania Fire Service and the Bureau of Meteorology. |
| | **Source of information**<br>***Number of maintenance spans***<br>The number of maintenance spans data is sourced from the vegetation management system and data provided by vegetation management service providers. |

***Total length of maintenance spans***

Total length of maintenance spans data is sourced from the vegetation management system (data populated by vegetation management service providers), the distribution span model and the spatial data warehouse.

***Length of vegetation corridors***

Length of vegetation corridors data is sourced from TasVeg spatial vegetation community data, TasNetworks' Spatial Data Warehouse and specialist consultant tree density analysis.

***Average number of trees per maintenance span***

Average number of trees per maintenance span data is sourced from the vegetation management system (data populated by vegetation management service providers) and the distribution span model.

***Average frequency of cutting cycle***

Average frequency of cutting cycle is prescribed within the Vegetation Operational Management Plan.

## Methodology and assumptions made

***General***

Only spans within TasNetworks' network that were subject to active vegetation management in the current reporting period have been included.

The breakdown of 'Urban and CBD' and 'Rural' spans has been accomplished by importing vegetation management span data into GIS systems and overlaying AER reliability area polygons in order to determine relationships. Results have been combined and entered in to an MS Access database to enable the use of pivot tables to provide data in the required format for RIN tables.

***Route line length within zone***

- The length of each span has been considered only once in calculating route line length, regardless of the number of circuits it contains.
- The distances between line and cable segments do not reflect vertical components such as sag.
- Changes in height are ignored.
- Multiple circuits counted only once.
- Service spans and private spans are not included within route line length calculations (as per Page 66 of the RIN, Appendix F: Definitions - Route Line Length).

***Number of maintenance spans***

- TasNetworks' primary vegetation management service provider submits the number of spans cleared and trees actioned within each span via electronic data capture and upload to TasNetworks' vegetation management system during the scoping and cutting phase of works.
- For the purpose of providing this data, TasNetworks has defined a maintenance span as "a span within TasNetworks' network that is subject to active vegetation management practices."
- The number of maintenance spans includes service lines that are subject to active vegetation management practices. Private spans that are not TasNetworks' responsibility to clear are not included.
- A small per cent of spans (approximately one per cent) do not link directly to span ID's within the model, therefore have not been included within number of maintenance spans completed.

***Total length of maintenance spans***

Each span identified for work can be linked via a specific span ID back to the Spatial Data Warehouse and Distribution Span Model providing the distance of each individual span.

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| | ***Length of vegetation corridors***<br>Vegetation corridor lengths have been estimated using spatial analysis by overlaying TasNetworks' network span model with recognised and modelled vegetation data.<br>• TasNetworks has provided estimated vegetation corridor lengths because actual spatial vegetation corridor records were not kept through the current reporting period.<br>• The TasVeg database was used to assign a vegetation 'community' to every network span from the Spatial Data Warehouse. A specialist consultant was engaged to analyse these communities and assign appropriate densities for vegetation that may interfere with overhead lines. Any line (or part of a line) within a vegetation community (tree density > 0) was considered part of a vegetation corridor.<br>• It has been assumed that the vegetation community data is sufficiently detailed and accurate on the scale of overhead spans.<br>• An objective, state-wide vegetation model is required to make meaningful comparisons and decisions when scheduling and prioritising vegetation work. While more accurate assessments could be made on a local scale, this would likely distort the system-view of vegetation corridors.<br>• As a corridor is a tract of land along which vegetation is maintained in order to form a passageway along the route of a power line or lines (e.g. a shared corridor) that is free of vegetation encroachment into the asset clearance space, the length of corridor is unlikely to change significantly from year to year. The length of exiting corridor is generally less that the total length of maintenance spans actioned each year, as many trees are cleared within spans that are not considered to be within vegetation corridors.<br>• Previous years data has been escalated as a proportion of network growth for this RIN.<br>***Average number of trees per maintenance span***<br>TasNetworks' vegetation management contractors submit the number of spans cleared and trees actioned within each span via electronic data capture and uploads to TasNetworks' vegetation management system during the scoping and cutting phase of works.<br>Scrub (trees with stem diametres >100mm) are listed within the vegetation management system as metres squared ($m^2$). One metre square of scrub is deemed to be one tree. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |
| **Table 2.7.2: Expenditure metrics by zone** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for vegetation management in accordance with the definitions and requirements of the RIN in that the costs associated with vegetation management work have been reported for each of TasNetworks' two nominated vegetation management zones. |
| | **Source of information**<br>Expenditure data reported in Table 2.7.2 has been sourced from TasNetworks' financial systems, which recognises each vegetation management zone as a separate vegetation management cost centre. |
| | **Methodology and assumptions made**<br>• TasNetworks does not split its vegetation zones into Northern, Central and Southern Regions. Rather, reporting is prepared on two nominated vegetation management zones. |

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| | • Cyclic cutting costs have been apportioned between Tree Trimming and Vegetation Corridor Clearance based on the length of vegetation corridors in each zone as a percentage of the rural route line length recorded for each zone.<br>• TasNetworks' does not identify trees as hazards to be treated differently from any other trees located in the vicinity of power lines. Therefore, the cells in Table 2.7.2 relating to hazard tree cutting have not been disclosed.<br>• Ground clearance works are not recorded separately and the associated costs are included in tree trimming expenditure.<br>• TasNetworks does not record expenditure on inspections of vegetation separately.<br>• TasNetworks does not capture expenditure on audits of vegetation management work separately.<br>• Contractor liaison expenditure has been sourced from TasNetworks' financial systems and reflects the number of FTEs specifically engaged in managing TasNetworks' vegetation management programme, in terms of the associated labour costs, labour on-costs and vehicle costs.<br>• TasNetworks has reported no tree replacement costs because trees near powerlines which are removed as part of vegetation management work are not replaced. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |
| **Table 2.7.3: Descriptor metrics across all zones – Unplanned vegetation events** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for vegetation management in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>The data reported in Tables 2.7.3 has been sourced from SAP. |
| | **Methodology and assumptions made**<br>• The data regarding fires started by vegetation blow-ins and fall-ins was extracted from SAP.<br>• TasNetworks does not generally categorise vegetation related fire starts as either caused by 'grow-ins' or by 'blow-ins or fall-ins'. TasNetworks has made an assumption that 'grow-ins' relate to trees inside the clearance space, whilst 'blow-ins or fall ins' relate to trees outside the clearance space. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 2.8 Maintenance

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| **Table 2.8.1: Descriptor metrics for routine and** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for maintenance in accordance with the definitions and requirements of the RIN in that it includes costs incurred for the simultaneous inspection of assets and vegetation and costs associated with access track maintenance. As we had no assets that the AER classifies as dual function assets, throughout the current reporting period, we have included no descriptor metrics for this asset class in table 2.8.1. |

| non-routine maintenance | Source of information |
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| | ***Pole top, overhead line & service line***<br>The volume of overhead service wires, and information associated with pole-top structures and overhead line installed was sourced from SAP or GTech.<br>***Pole inspection and treatment***<br>• Pole inspection and treatment information was sourced from SAP.<br>• Five yearly inspection cycle is as per Asset Management Plan/Asset Inspector Pole Inspection Training Manual.<br>***Overhead Asset Inspection***<br>Overhead asset inspection information was sourced from SAP.<br>***Network underground cable***<br>Asset data from SAP<br>***Distribution substation***<br>• Asset data sourced from SAP<br>• Ground Mounted Substations data base; and<br>• Distribution Substation Asset Management Plan.<br>***Pole mounted distribution substation***<br>• The volume of pole mounted distribution substations was sourced from SAP.<br>***Zone substation***<br>• Asset data sourced from SAP; and<br>• Zone Substation Asset Management Plan.<br>***Public lighting***<br>Public lighting quantities have been sourced from TasNetworks' Market Data Management System (GenTrack) and the volumes of public lighting inspection and maintenance activity have been sourced from TasNetworks' financial systems, based on the quantities of materials issued for this work category.<br>***SCADA, network control and protection systems***<br>• Asset information has been sourced from SAP, NOCS remote communications records, site audit information, test reports stored in TasNetworks' intranet 'The Zone', field personel asset/work records, or asset management plans.<br>***Ground clearance - access tracks***<br>All data regarding access tracks was originally sourced from:<br>• TasNetworks' Spatial Data Warehouse and GTech; and<br>• TasNetworks' distribution 'Span Model' – a database of pairs of geographic coordinates that correspond to poles with at least one connecting conductor circuit. The Span Model was been derived from spatial conductor data in the Spatial Data Warehouse specifically to meet the AER's definition of Route Line Length:<br>o TasNetworks has a service level agreement with the Tasmanian Department of Primary Industries, Parks, Water and Environment for the Land Titles Office to supply up-to-date GIS transport information sourced from the Land Information System Tasmania (The LIST). This includes details of public highways, streets and known private off-road trails.<br>• The above methodology can no longer be applied to SAP data systems, therefore previous years data has been escalated as a proportion of network growth.<br>The 'Units' descriptor for access tracks within table 2.8 is assumed to be kilometres.<br>***Other (Metering transformers)***<br>• The volume of metering transformers and age data was sourced from TasNetworks' Market Data Management System (Gentrack); and<br>• Metering transformer inspection data was sourced from Bravo (SOM). |

## Methodology and assumptions made

***Service line maintenance***

- Other than visual inspections undertaken as part of TasNetworks' pole inspection programme, no service wires were inspected during the current reporting period as part of a programme of service line inspection. As TasNetworks had no specific inspection cycle for service wires, TasNetworks has reported no activity in relation to the testing of service lines.

***Pole top and overhead line; Pole inspection and treatment***

- The number of poles has been derived by taking a count of the poles recorded in SAP filtered by date installed and grouped by different pole owners in order to exclude privately owned poles from the count.
- The pole count (i.e. number of pole ids) and pole owners were extracted from TasNetworks' Spatial Data Warehouse, as were pole installation dates, with poles and installation dates being matched on the basis of each pole's unique asset identifier.
- The number of pole inspections conducted during the current reporting period was derived by taking a count of completed work tasks in SAP, filtered by date completed to return only inspections carried out in the current reporting period.
- Pole inspections were defined as including only work tasks classified as either Pole Inspect or Inspect Pole Special Inspections in SAP with a status of Closed or Completed.
- The average age of poles is calculated from the base of asset age profile reported on Category Analysis RIN 5.2.1.
- The poletop structures are assumed to be approximately the same age as the poles and therefore have the same average age. These are replaced when the pole is replaced.

***Overhead Asset Inspection***

- The line patrolled value was calculated by multiplying the value of conductor length in service by the number of poles inspected divided by the total number of poles. Additional kilometres patrolled added if helicopter inspection done.
- Five yearly inspection cycle for overhead assets is as per Asset Management Plan/Asset Inspector Pole Inspection Training Manual.
- Pole top structures and pole mounted equipment is inspected during the scheduled pole inspections. The number of pole inspections completed therefore replects the number of pole top structures and equipment inspected.
- Network underground cable maintenance by voltage; Network underground cable maintenance by location;
- Asset volumes were sourced from the spatial data warehouse, and SAP;
- Maintenance volumes were sourced from SAP;
- Average age is calculated by summing the ages of all assets and dividing by the volume for each asset class;
- Inspection and maintenance cycles are sourced from the appropriate management plan. Where varying frequencies exist the tasks with the highest cost has been used as the frequency. Historically, as there are several maintenance frequencies for some tasks, a weighted average has been applied;
- Zone substation volumes and maintenance frequencies were sourced from TasNetworks asset management plan;
- Rural zone substations (22kV) were classified as distribution substations.
- Average age data for zone substations was calculated using information relative to each Zone substation where:
    - Average age of transformer = total age for all transformers / number of items
    - Average age of switchgear = total age for all switchgear/number of items

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| | ***Distribution and Zone substation equipment and Property maintenance***<br>• The transformer reporting for Distribution substations only includes pad mounted and ground mounted distribution transformers. The pole mounted distribution substations are reported under 'other'.<br>• Asset volumes were sourced from SAP.<br>• Switchgear volumes were sourced from the 'Ground mounted substation data base'. The value includes switchgear in ground mounted substations and standalone switching stations.<br>• Asset inspection and maintenance volumes were sourced from SAP. The value reported for 'Inspected/Maintained' is taken as being reporting for the number of unique assets inspected or maintained i.e. duplicated activities at the same site were not included in the reported value.<br>• Average age for assets is calculated using only the assets that have a known installation date. Asset without installation dates were excluded.<br>• Inspection and maintenance cycles are sourced from the appropriate management plan. Where varying frequencies exist, the tasks with the highest value asset type has been used as the frequency.<br>• Inspection cycles for substations are either once per year, or every two years depending on the substation type. As approximately 1500 of the 2000 substations are inspected every two years, a value of two years was reported for the inspection cycle. Zone substation volumes and maintenance frequencies were sourced from TasNetworks asset management plan.<br>• There is no planned maintenance cycle for zone substation for properties.<br>• Rural zone substations (22kV) were classified as distribution substations<br>• Average age of zone substation switchgear was calculated from total age for all switchgear/number of items.<br>***Public lighting maintenance***<br>• TasNetworks has limited data relating to the installation date of individual lights. Age data for lights with no install date was estimated using procurement records or by interviewing employees involved historically with the installation of lighting assets.<br>• Inspection and maintenance cycles for major and minor lights are based on the average expected life of lamp and photo-electric (PE) cell.<br>***SCADA, network control and protection systems***<br>• SCADA & network control systems include:<br>o Reclosers<br>o Load break switches<br>o Sectionalisers<br>o Kiosk substations<br>o Fault indicators<br>o Regulating transformers<br>o Building substations<br>o Zone substations (in terms of a complete SCADA system per zone substation).<br>• Protection systems include:<br>o Zone substation protection schemes such as transformer, feeder, busbar, etc.<br>o Distribution building substation transformer protection schemes.<br>o Distribution building substation feeder protection schemes sometimes referred to as "Translay".<br>• Average age is based on the average installation age of the protection or SCADA systems. |

- Approximately 22 per cent of the population of Recloser, LBS, sectionaliser, fault indicator, voltage regulator, and kiosk RTU devices had no installation dates and were not included in the average age calculation.
- Maintenance of protection schemes is performed every 4 years for building substations and currently only zone substation protection schemes are tested if not previously routine tested following commissioning.
- SCADA systems are tested during the routine testing of the protection schemes.
- Inspection of protection and SCADA systems is performed yearly for CBD building substations and 4 monthly for zone substations as stated in the relevant asset management plans.

***Ground clearance - access tracks***

- The inspection and maintenance cycle for access tracks is the same as the pole inspection cycle in order to ensure access to assets for inspectors for the purposes of inspecting poles.
- The average age of access tracks is assumed to be the same as that of the overhead/pole assets to which they provide access, on the basis that the tracks would have been established around the same time the assets were installed.
- Spans only containing LV circuits are not included in the current iteration of the Span Model. TasNetworks' current program of 'active' vegetation management is based on the Span Model and LV-only spans are not actively managed.

***Other (metering current transformers)***

- The volume of metering current transformers was sourced from TasNetworks' Market Data Management System (Gentrack). Due to the way some third party metering providers provide meter standing data (including metering current transformers) to the NEM, TasNetworks is unable to provide data for metering current transformers where TasNetworks is not the metering provider.
- Metering current transformer inspection data was sourced from Gentrack as a count of completed service orders;
- The ten year maintenance cycle is per the asset management plan for metering current transformers and is designed to comply with the requirements of Chapter seven of the National Electricity Rules for metering installations.
- Age data for metering current transformers was sourced from Gentrack, based on the first recorded connection dates of installations with metering current transformers.

***Pole mounted distribution substation***

- Transformers were only included if they had a construction type of 'SINGLE POLE' or 'DOUBLE POLE' and were owned by TasNetworks
- The maintenance cycles for pole mounted distribution substations is based off the transformer earth maintenance schedule.

## Use of estimates

Unless specified below, no estimates have been used in the collation and presentation of this information.

***Pole top, overhead line & service line maintenance***

TasNetworks does not maintain records of inspection dates for service wires or 'pole-top structures' and so inspection data for poles was used to estimate the inspection regime of service wires and 'pole-top structures'.

***Public lighting maintenance***

Where actual age data for specific lights is not available, the age data for lights was estimated by applying a flat age profile for each make / model of light over the period each particular light was purchased according to purchasing contract records.

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| | ***SCADA, network control and protection systems***<br>• Protection schemes for building substation transformers, and feeders have been estimated as the same installation date of the complete substation where the original electromechanical protection relay still exists e.g. GEC HO4B.<br>• SCADA systems for Reclosers, LBS and sectionalisers have been estimated as the same installation date as the Recloser, LBS or sectionaliser.<br>• Where installation dates are not available for the complete substation and subsequently the secondary equipment, the assets are not included in any age based calculations such as average asset age or the age profile.<br>***Sub-transmission asset maintenance***<br>• TasNetworks had no dual function assets and, therefore reported no descriptor metrics for the maintenance of dual function assets.<br>***Ground clearance - access tracks***<br>• TasNetworks does not currently maintain a separate record of access track clearance activity, with ground clearance activities and costs currently being captured under the broader activity of 'pole top, overhead line & service line maintenance'.<br>• The length of access tracks cleared in the current reporting period has, therefore, been estimated, by dividing the route length of TasNetworks' distribution network which requires non-standard vehicle access (as reported in TasNetworks' response to the Economic Benchmarking RIN for the current reporting period) by the length of the inspection cycle for access track.<br>• The sections of TasNetworks' distribution network requiring non-standard vehicular access have been identified using GTech to identify spans located more than 25 metres from the nearest private off-road trail, public highway or street. Trails explicitly flagged '4WD only' have been excluded as a recognised transport element. After excluding trails explicitly flagged '4WD only', the reported length of the distribution network not within 25m of any transport element is taken to represent the component requiring non-standard vehicular access and, therefore, ground clearance.<br>• Data from the previous reporting period has been escalated in proportion to route line length increases to represent data for the current regulatory period.<br>***Other***<br>• Actual install dates for metering current transformers is not available. Age data was estimated based on the first connection date of installations with metering current transformers<br>  ○ TasNetworks is establishing an asset database for metering current transformers to record this information. |
| **Table 2.8.2: Cost metrics for routine and non-routine maintenance** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for maintenance in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>• SAP |
| | **Methodology and assumptions made**<br>• The routine and non-routine maintenance expenditure reported in Table 2.8.2 has been extracted on the basis of work category codes, which represents the manner in which TasNetworks captures routine and non-routine maintenance expenditure. |

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| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 2.9 Emergency response

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| **Table 2.9.1: Emergency response expenditure (opex)** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for emergency response in accordance with the definitions and requirements of the RIN in that:<br>Emergency response expenditure attributable to major events has been identified using a specific cost code for major events;<br>Emergency response expenditure attributable to major event days has been compiled by identifying the daily operating expenditure incurred on each major event day (**MED**) and summing the expenditure for each event; and<br>Any major storm days identified during the current regulatory year include only tropical cyclones of category 1 or above. |
| | **Source of information**<br>• SAP |
| | **Methodology and assumptions made**<br>• TasNetworks' Regulatory Accounts have been used to reconcile the data<br>• The cyclone history on the Bureau of Meteorology website has been used to confirm if any have occurred during the year.<br>• Major Event Days throughout the period have been identified with reference to MED System Average Interruption Duration Index thresholds calculated using the method prescribed by the AER.<br>• The information contained in Table 2.9.1 has been filtered by work category code and cross referenced against the Major Event Days table. In the interests of accuracy, emergency response expenditure data has been extracted with reference to transaction dates (i.e. 'document dates'), which correspond to MEDs, rather than the posting dates recorded in TasNetworks' finance system.<br>• TasNetworks' emergency response expenditure includes expenditure captured in TasNetworks' financial systems in relation to the following types of emergency response activities:<br>  o Emergency & Unscheduled Power System Response & repairs (EMRES)<br>  o Emergency Management - Customer damage to TasNetworks' Asset (EMDAA)<br>  o Emergency Response - Major Event (EMMAJ)<br>• The emergency response expenditure shown in Table 2.9.1 under (b) includes expenditure incurred in responding to all faults that occur on MEDs. The emergency response expenditure totals shown in Table 2.9.1 under(c) include only the costs relating to emergency responses to major events on major event days (EMMAJ). These costs have been taken directly from the network system ledger, meaning that the costs reported for individual days will include capitalised expenditure, but not all overheads and CAM adjustments as they are done on a monthly or end of year basis. The difference between the total EMMAJ category extracted from the network service ledger and what is included in the Annual Reporting RIN has been reconciled. |

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| | • None of the costs of responding to faults and emergencies reported in Table 2.9.1 include the costs associated with the standing down of field crews, as far as they relate to events involving faults and damaged TasNetworks' assets.<br>• Emergency response expenditure attributable to major events has been identified using a specific cost code for major events<br>• Emergency response expenditure attributable to major event days has been compiled by identifying the daily operating expenditure incurred on each MED and summing the expenditure for each event.<br>• Emergency response expenditure data has been extracted with reference to transaction dates (i.e. 'document dates'), which correspond to MEDs, rather than the posting dates recorded in TasNetworks' finance system. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 2.10 Overheads

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| **Table 2.10.1: Network overheads expenditure**<br><br>**Table 2.10.2: Corporate overheads expenditure** | **Consistency of information with the requirements of the RIN**<br>• Information has been presented for overheads in accordance with the definitions and requirements of the RIN in that it includes expenditure for each of the mandatory subcategories discussed in the RIN.<br>• There have been no material changes in reported expenditures as a result of changes in TasNetworks' capitalisation policy. |
| | **Source of information**<br>• SAP<br>Annual Reporting RIN |
| | **Methodology and assumptions made**<br>***Network Overheads Expenditure – to all services (total costs including capitalised portion)***<br>• This information has been derived on the basis of a combination of Network Management and Network Services cost pools. Network Management and Network Services cost pools have been populated from TasNetworks' Annual Reporting RIN;<br>• Network operating costs reported under Network Management costs have been allocated between the six subcategories of overhead expenditure set out in Table 2.10.1 based on the type of work performed, and then allocated to the forms of control; and<br>• The Network operating costs attributed to Network Services in each year were extracted from TasNetworks' financial system's General Ledger Overheads Applied by work category code, and then allocated to the forms of control. These were then allocated to the six subcategories based on the actual percentage spend of all the overheads departments from the financial system, based on the type of work performed.<br>***Network Overheads Expenditure – to capitalised overheads for only Standard Control Services***<br>• This information has been derived from an aggregate of relevant Network Management and Network Services cost pools. The Network Management costs that have been allocated to capital works have been extracted from TasNetworks' financial systems. |

Network Services costs that have been allocated to capital works (capex jobs only) have also been drawn from TasNetworks' financial systems;

- Network operating costs relating to Network Management amounts that have been capitalised were allocated to the six subcategories based on the allocation of departmental overheads. They were then allocated to the forms of control based on actual percentage to only capital jobs and the split of the type of work performed; and
- Network operating costs relating to Network Services cost recovery against jobs were sourced from TasNetworks' financial system and based on costs that were coded to the General Ledger Overheads Applied code. They were then broken down in each year by work category code to the allocated forms of control as per below. The costs allocated to each form of control were then allocated between the six subcategories in template 2.10 based on the actual percentage spend of all the overheads departments on each type of work performed.

***Corporate Overheads Expenditure – to all services (total costs including capitalised portion) and capitalised overheads for Standard Control Services***

Corporate Overheads have been populated using the costs allocated in accordance with TasNetworks' Cost Allocation Model which are in line with the Indirect Cost Allocation Model utilised in prior years.

***Allocation to forms of control***

The allocation of Network Overheads between the different forms of control has been based on two methodologies, both of which are in accordance with TasNetworks' approved CAM:

- Network Management costs have been allocated between the forms of control based on the percentage spend of the total program of work costs driver of forms of control; and
- Network Services costs have been automatically allocated between forms of control according to the type of work (e.g. work category code), with each type of work allocated directly in TasNetworks' ledger to the relevant form of control.

***Corporate Overheads Expenditure – to all services (total costs including capitalised portion)***

The allocation of Corporate Overheads has been split between Network Management and Network Services on the basis of actual spend, and then allocated to a subcategory. The allocation of expenditure within each subcategory between the forms of control has been undertaken using different methodologies for Network Management and Network Services in accordance with the allocation described in Network Overheads Expenditure.

***Corporate Overheads Expenditure – to capitalised overheads for only Standard Control form of control***

Corporate overheads expenditure has been calculated on the same basis as the network operating costs relating to Network Services.

## Use of estimates

No estimates have been used in the collation and presentation of this information.

# Template 2.11 Labour

**Table 2.11.1: Cost metrics per annum**

**Table 2.11.2: Descriptor metrics**

## Consistency of information with the requirements of the RIN

Information has been presented for labour in accordance with the definitions and requirements of the RIN in that:

- only labour costs allocated to the provision of standard control services have been reported
- labour data has been broken down into the Classification Levels in template 2.11
- TasNetworks has not separately reported labour sourced through labour hire contracts
- Average Staffing Levels (ASLs) for each Classification Level reflect the average paid FTEs for each Classification Level over the course of a given year
- 'Per ASL' values are average values for each Classification Level
- stand down periods have been reported against the relevant classification level in the table containing the relevant labour

## Source of information

- TasNetworks Financial Systems
- TasNetworks Payroll System

## Methodology and assumptions made

***General***

- Field staff often need to stand-down, and when this occurs they include this information in the time which they charge to a job. When entered into TasNetworks' financial systems the jobs used include 'STANDDOWN' in the job description to identify this time. TasNetworks' financial systems jobs were identified and transactions were extracted for these jobs so that occurrences could be counted.
- Productive work hours have been determined using the available working days per year, adjusted for assumptions developed for budgeting purposes about the average amount of leave (annual, sick leave and public holidays) taken per FTE.
- Office based corporate employees have been assumed to work a standard week, that is 37.5 hours, this extends for the year, reduced by estimated leave per FTE, as follows:
  - average of 20 days annual leave taken per FTE
  - average of 6 days sick leave per FTE
  - actual Public holidays per annum (10)
  - average of 5 additional other days (carers leave and LSL)
- The labour data was categorised into normal time and overtime.
- The average productive normal time hourly rate has been determined by taking actual labour costed to standard control services and dividing that cost by the actual labour hours that have been worked for standard control services per classification type.
- The average productive overtime hourly rate reflects the average of the hourly overtime rates applied to each labour class of employees.

***Corporate overheads (Average Staffing Levels)***

- Reported total FTE numbers are as at 30th June of the current reporting period, as provided in TasNetworks' staffing report;
- Employee job titles as per TasNetworks' Payroll System (TasNetworks' classification) were categorised into the AER's required classifications as per the RIN instructions; and

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| | • To determine the ASL per labour classification level, the FTE numbers in each RIN labour category were multiplied by the relevant standard control services percentage in accordance with TasNetworks' CAM.<br>***Corporate overheads (Total Labour costs)***<br>Total labour costs are reflective of the actual corporate labour costs that have been charged to distribution services plus the labour costs associated with the corporate functions (i.e. the finance and regulatory functions).<br>***Network overheads (Average Staffing Levels)***<br>Average ASLs for each labour classification type have been determined using actual FTE data and the total labour costs.<br>***Network overheads (Total Labour costs)***<br>Total labour costs are reflective of the actual labour costs that have been charged against individual network services and network jobs within TasNetworks' job ledger.<br>***Total direct network labour (Average Staffing Levels)***<br>The ASL for each labour classification type that has been allocated to standard control services has been determined using the actual number of FTEs per each classification type.<br>***Total direct network labour (Total Labour costs)***<br>Allocated to standard control services based on actual labour costs captured against standard control services categories as per costing in TasNetworks' financial system for each year. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 2.12 Input tables

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| **Table 2.12: Input tables** | **Consistency of information with the requirements of the RIN**<br>The information provided is consistent with the requirements of the RIN. |
| | **Source of information**<br>• SAP<br>• Table 2.2 – 2.9 of the RIN<br>• Table 4.1 – 4.3 of the RIN |
| | **Methodology and assumptions made**<br>Actual job costs are directly captured in TasNetworks' financial system as labour, materials, and contract costs and/or 'other' costs in line with Template 2.12 where possible. However, in cases where unit rates have been used to allocate costs to a job, for the purposes of Table 2.12, the associated expenditure on those jobs has been apportioned between the above cost categories based on the expenditure in each category recorded in the Network Services ledger as a percentage of the total. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 4.1 Public lighting

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| **Table 4.1.1: Descriptor metrics over year** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for public lighting in accordance with the definitions and requirements of the RIN in that:<br>• The data provided reconciles to internal planning models used in generating TasNetworks' proposed revenue requirements; public lighting volumes and costs have been recorded on an incurred basis;<br>• Lighting types have been reported in a manner which is consistent with the RIN definitions of major and minor lighting;<br>• Customer contributions have not been subtracted from the amounts reported; and<br>• No information relating to gifted assets has been included. |
| | **Source of information**<br>The population of each public lighting type for the current reporting period was sourced from Gentrack. This system is the master record for public lighting. |
| | **Methodology and assumptions made**<br>The lighting volumes were reported based on install date information from Gentrack and Unmetered Supply (UMS) audits. These volumes are consistent with the volumes used for the purposes of retailer billing and are consistent with the volumes assumed for the purposes of asset management. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |
| **Table 4.1.2: Descriptor metrics annually** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for public lighting in accordance with the definitions and requirements of the RIN in that:<br>• Costs have been recorded on an as incurred basis; and<br>• Costs have been classified as either:<br>  ○ replacement<br>  ○ installation<br>  ○ maintenance expenditure<br>• The quality of supply data describes the voluntary 'GSL' payments made in relation to public lighting under TasNetworks' Customer Charter |
| | **Source of information**<br>• SAP<br>• GTech<br>• Gentrack<br>• Service Order Management<br>• The Podium |

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| | **Methodology and assumptions made**<br>***Cost***<br>• Cost data has been sourced from TasNetworks' financial systems and reconciled to the regulatory accounts; and<br>• Costs relating to private lights have been excluded through apportioning total costs against the volume of public and private lights as at year end.<br>***Volumes***<br>• Volumes of public lighting materials for lamps and luminaires installed during the current reporting period were sourced from the TasNetworks' financial systems;<br>• Volumes of dedicated public lighting poles were sourced from GTech;<br>• Materials are classified into major or minor public lighting categories according to the type of asset. Luminaires up to and including 100 watts are classified as minor lights and over 100 watts are major lights;<br>• Light replacements are defined as luminaire replacements (capex) and light maintenance is defined as the lamp replacements (opex); and<br>• When materials are issued from the warehouse they are assigned to a work pack that corresponds to the type of task being performed, e.g. install new light, fault response or replacement.<br>***Mean days to rectify***<br>Calculation of the mean days taken to rectify or replace public lighting assets was based on a count of business days between the creation and completion dates recorded for each service order relating to public lighting faults in SOM.<br>***Quality of supply***<br>• Data relating to complaints from customers about public lighting was sourced from TasNetworks' customer management system, The Podium, by the Customer Advocacy Team.<br>• The volumes and values of payments made to customers who received a standard of service below that set out in the charter in the current reporting period have been derived from records kept in the Charter Payment Tool, which is part of TasNetworks' customer complaint management systems.<br>• GSL payments for Public Lighting have been removed from TasNetworks Customer Charter since 18/19 FY. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |
| **Table 4.1.3: Cost metrics** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for public lighting in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>• TasNetworks Financial Systems |
| | **Methodology and assumptions made**<br>• The volumes of public lighting materials for lamps and luminaries' installed were sourced from the TasNetworks' finance system.<br>• Cost data has been reconciled to the Annual Reporting RIN. |

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| | • Materials have been classified into major and minor public light categories according to the type of asset.<br>• When materials are issued from the warehouse they are assigned to a work pack that corresponds to the type of task being performed (e.g. install new light, fault repair or replacement etc.).<br>• Public lighting costs are, however, captured for the entire lighting suite, rather than specific to particular lighting types.<br>• Light replacement and light maintenance have been sourced from TasNetworks' financial systems and combined with calculated unit rates to derive average cost by lighting type. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 4.2 Metering

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| **Table 4.2.1: Metering descriptor metrics** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for metering in accordance with the definitions and requirements of the RIN. |
| | **Source of information**<br>• Gentrack<br>• Bravo (SOM) |
| | **Methodology and assumptions made**<br>The Gentrack query is run on the first working day of each month and the resultant data is saved so that a total of installed meters at the start of each month is recorded.<br>The volumes were sourced from a snapshot from Gentrack of all basic meters. This was analysed to define the types of meters for each RIN category. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |
| **Table 4.2.2: Cost metrics** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for metering in accordance with the definitions and requirements of the RIN in that it includes expenditure incurred in relation to all non-contestable, regulated metering services. |
| | **Source of information**<br>• SAP<br>• Bravo (SOM)<br>• Gentrack |
| | **Methodology and assumptions made**<br>• Actual expenditure (excluding overheads) is as per TasNetworks' financial systems. |

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| | • Volumes (except Meter purchase and Scheduled meter reading) are sourced from Bravo (SOM) data of the financial year.<br>• The Work Category Codes used to extract metering costs from the financial systems capture the costs associated with: Meter Reads and special meter reads (MDSMR), Meter Replacement, (MEREP) Meter Testing (AIMET), Meter Maintenance and Investigations (ARMER) and Meter Installations (MENIN).<br>• The costs of purchasing meters has been determined by applying the unit rate against the volume of meters purchased, which were sourced from Gentrack.<br>• Meter Reads split costing is based on individual job numbers that capture special and scheduled reads on the Network Services side as other labour costs applied after intercompany transfer have apportioned labour and overhead costs based on the actual in Network Services.<br>• Scheduled Meter Reading numbers are extracted from monthly conformance reports (total reads).<br>• Every meter inspection involves removing the seal to assess the meter. Resealing the meter is counted as maintenance, therefore every inspection involves the meter being maintained regardless of the repair amount. All meter maintenance involves an investigation first, therefore the volumes of the service subcategories are the same. |
| | **Use of estimates**<br>• TasNetworks does not capture the cost of conducting metering investigations, with metering investigation costs captured under the broader expenditure category of Meter Maintenance and Investigations. In order to provide the requested metering investigation costs, expenditure on meter maintenance has been apportioned between Meter Investigations and Meter Maintenance on the basis of a 20/80 percentage split.<br>• The split between meter maintenance and investigations represents an estimate by the relevant Asset Manager that seeks to average the significant variation in investigative effort involved across a wide range of meter maintenance jobs. |

# Template 4.3 Ancillary services – Fee-based services

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| **Table 4.3.1: Cost metrics for fee-based services** | **Consistency of information with the requirements of the RIN**<br>• Information has been presented for ancillary services – fee based services in accordance with the definitions and requirements of the RIN; and<br>• Section 15.3 of the RIN requires TasNetworks to provide a description of each fee based service listed in regulatory Template 4.3 that explains the purpose of each service and details the activities which comprise each service. That information is available in the Ancillary Services – Fee Based Services Guide available on TasNetworks' website. |
| | **Source of information**<br>• SAP<br>• Bravo (SOM)<br>• Gentrack |
| | **Methodology and assumptions made**<br>• The costs associated with the provision of fee-based services have been reconciled to the Annual Reporting RIN; |

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| | • Volume data relating to fee-based services was sourced from Bravo (SOM) based on service orders with an overall status of 'complete';<br>• All miscellaneous fee-based services volumes were sourced from Bravo (SOM) based on service orders with an overall status of 'complete'.<br>• All annual energisation, de-energisation and re-energisation volumes were sourced from Gentrack.<br>• All costs incurred in the provision of fee-based service are captured against the same cost code in TasNetworks' finance system. For the purpose of Table 4.3.1, total fee-based service costs have been apportioned across fee-based service sub-categories on the basis of Regulated Prices and activity volumes.<br>• All annual energisation, de-energisation and re-energisation volumes were sourced from Gentrack.<br>• Basic Connection Services are not included in the Fee-Based Services volumes.<br>• The installation of pulse outputs are included in tariff alterations. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 4.4 Ancillary services – Quoted services

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| **Table 4.4.1: Cost metrics for quoted services** | **Consistency of information with the requirements of the RIN**<br>• Information has been presented for ancillary services – quoted services in accordance with the definitions and requirements of the RIN in that:<br>• TasNetworks has not distinguished between standard or alternative control services when reporting expenditure for quoted services, as per paragraph 15.4;<br>• TasNetworks has not differentiated between capex or opex in relation to the expenditure reported on quoted services, as per paragraph 15.5;<br>• the capture of costs for quoted services provided in Template 4.4 is consistent with the definition of quoted services given in Appendix F of the RIN;<br>• Section 15.1 states that the data provided in relation to quoted services must reconcile to internal planning models used in generating TasNetworks' proposed revenue requirements. The information provided for the current reporting period has been based on actual data and reconciles with the data provided in response to the Annual Regulatory Information Notice for the same year;<br>• Section 15.2 is not applicable to TasNetworks, as quoted services are not listed in TasNetworks' annual tariff proposal; and |

- Section 15.3 requires TasNetworks to provide a description of each quoted service listed in regulatory template 4.4 that explains the purpose of each service and details the activities which comprise each service. That information is provided in the following table:

| Service | Purpose | Activities |
|---|---|---|
| Relocation/Removal - Poles | To capture expenditure on customer driven pole relocations/removals | Pole relocation and removal in its entirety |
| Relocation/Removal - Substations | To capture expenditure on customer driven substations relocations/removals | Relocation and removal of substation in entirety or components, eg door way removed or building design mortifications |
| Relocation/Removal - Transformers | To capture expenditure on customer driven transformers relocations/removals | Transformers removal and relocation in its entirety |
| Relocation/Removal - Overhead | To capture expenditure on customer driven overhead assets relocations/removals | Relocation or removal of overhead components including; low voltage wire, high voltage wire , service wire, fibre, conductors, switches/fuses |
| Relocation/Removal - Underground | To capture expenditure on customer driven underground assets relocations/removals | Relocation or removal of underground components including; low voltage cables, high voltage cable, cabinets, turrets |
| Services of higher standard - Substation | To capture expenditure on customer driven above standard substation works | Modifications to substation for customer needs, including; building design modifications |
| Services of higher standard - Transformers | To capture expenditure on customer driven above standard transformer works | Modifications to transformer design for customer needs as requested |
| Services of higher standard - Overhead | To capture expenditure on customer driven above standard overhead asset works | Modifications to overhead asset design for customer needs, including; overhead wires both low voltage and high voltage, service wire, conductors etc |
| Services of a non standard nature - Connections | To capture expenditure on customer driven service connection and metering works | Disconnects, reconnections, metering upgrades, new mains connections |
| Services of a non standard nature - Subdivisions | To capture expenditure on customer driven subdivision overhead and underground works | Could encompassed both overhead and components, looks at activities directly related to subdivisions as requested by developers |
| Services of higher standard - Poles | To capture expenditure on customer driven poles above standard pole works. | Modifications to line designs for customer needs, including the installation of additional poles |
| Services of a non standard nature - Underground | To capture expenditure on customer driven underground works. | Modifications to cable designs for customer needs including cable size and location |

## Source of information

- TasNetworks Financial Systems

## Methodology and assumptions made

- Information has been reconciled to the Annual Reporting RIN.
- Data has been obtained directly from TasNetworks' financial systems for the direct work costs associated with quoted services work. These costs have then had the overhead component removed and reconciled back to the Opex Allocation Model.
- Data was extracted from WASP for all projects relating to quoted services (i.e. Work Level = QUOT). This data details the Service Sub-Category relating to project costs. In instances where the Service Sub-Category field was blank, the project details were manually checked in TasNetworks' financial systems to determine the nature and, therefore, the applicable Service Sub-Category.
- Data was also extracted from WASP for the work category CIMIX, which is used to apportion costs to projects that relate to multiple service types.
- Information related to corporate overheads and shared services costs were sourced from the Annual Regulatory Information Notice – Opex Allocation Model.
- Quoted services project data from WASP was summarised into Work Categories and Design Project Types with associated total costs and volumes. Design Project Types have been mapped to a RIN Service Subcategory to enable direct population of Table 4.4.1.
- The following assumptions were applied to the data:
    - where a Work Category links directly to a type of service, all volumes and costs for that Work Category were applied to that service e.g. the work category QUSCO is 100 per cent allocated to the service "Services of a non-standard nature – Connections"

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| | ○ the Design Project Type was used to classify projects across service types e.g. where 'pole' has been recorded as the project description, it was assumed that the project related to poles<br>• When assumptions 1 or 2 could not be applied, information about the service type was manually sourced from WASP by referencing customer letters, project notes or directly from the scope.<br>• In relation to volumes data, a 'one project for one service' relationship was assumed for all service types (i.e. volume = 1 for each project) except for pole relocation and removal.<br>• For the 'Relocation/Removal – Poles' service category, volumes were derived using a unit rate per pole against the cost of the project. The unit rate was built up by a business expert. The volume derived for each project has not been rounded or truncated to arrive at the overall annual total. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 5.2 Asset age profile

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| **Table 5.2.1: Asset age profile** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for asset age profile in accordance with the definitions and requirements of the RIN in that:<br>• the asset subcategories in Table 5.2.1 correspond with the prescribed asset categories in Table 2.2.1; and<br>• the information reflects total volumes of assets currently in commission.<br>The information provided in relation to SCADA, Network Control and Protection Systems is consistent with the definition provided in the RIN notice. |
| | **Source of information**<br>• Spatial Data Warehouse<br>• Gentrack (for Public Lighting age profile)<br>• SCADA, network control and protection systems<br>• Asset information has been sourced from SAP, site audit information, test reports stored in TasNetworks' intranet 'The Zone', or documentary records such as asset management plans. |
| | **Methodology and assumptions made**<br>***General***<br>• TasNetworks reported asset age profile was reported on a calendar year basis up until 2015/2016 and from 2016/2017 it is reported on a financial year basis and which all asset categories are affected by the change;<br>• The economic lives for TasNetworks' assets are sourced from TasNetworks' Regulated Asset Base, other than public lighting assets where asset lives have been taken from TasNetworks' public lighting annuity model; and<br>• The standard deviation for the economic life of TasNetworks' assets has been estimated as the square root of the mean, as discussed on page 51 of the AER's explanatory statement for the RIN. |

***Poles***

- Pole data is captured either through in-field work processes, or by pole inspectors operating under a five year inspection cycle, delays of over 12 months may be experienced in the data capture process. Rules applying to the recording of new poles in TasNetworks' GIS also require that poles can only be added to the database when they have been assigned a Pole Tag ID and their installation has been confirmed. If no confirmation is received from the field of a pole having been erected, a record of the new pole may not be added until the pole is next inspected, which may not occur for another five years under TasNetworks' current inspection regime;
- An extract of pole asset data was taken from TasNetworks' spatial data warehouse. Attributes that were extracted included: pole material, pole staking status, voltage, and installation date. Only poles owned by TasNetworks and a small number of poles with unknown or null owners were included. All poles dedicated to public lighting were excluded from this data set; and
- Poles were categorised by material and by voltage.
- A small number of poles still do not have an installation date.
- The five yearly inspection cycle is as per asset management plan/Asset Inspector Pole Inspection Training Manual.

***Overhead conductors***

As discussed in estimated information section below.

***Underground cables***

As discussed in estimated information section below.

***Service lines***

As discussed in estimated information section below.

Service lines are overhead lines so this section does not included underground services. Underground services are not recorded by TasNetworks as they are customer owned.

***Transformers***

- Transformer asset data was sourced from SAP
- Transformers were categorised by construction type as either pole mounted, kiosk mounted (including pad-mounted transformers) or ground outdoor/chamber mounted.
- For kiosk mounted (including pad-mounted transformers), ground outdoor/chamber mounted and pole mounted transformers the time series reporting only included transformers with a known installation date. For this reason the total number of transformers reported in the time series does not match the total number or installed transformers reported in 2.8.
- Transformers with a recorded phase count of 0, 1 or 2 have been classified as single phase transformers.
- Pole Mounted Transformers age profile data 95% complete.
- Pole Mounted Transformers age profile excludes transformers with UNKNOWN age, hence the total in 5.2.1 is not equal to table in 2.8.

***Switchgear***

- An extract of HV and LV switchgear asset data was taken from TasNetworks' volume dashboards for overhead switchgear which combine SAP and GIS data.
- Records for switchgear installed in ground mounted substations and switching stations was sourced from the 'Ground mounted substations database'.
- For kiosk mounted (including pad-mounted transformers) and ground outdoor/chamber mounted switchgear that was included in the time series the volumes only included switchgear with a known installation date. For this reason the total number of switches and circuit breakers reported for ground mounted substations in the time series does not match the number of 'switchgear' reported in 2.8.

- All switchgear was categorised by voltage and type into required categories for the RIN as advised by subject matter experts, and then consolidated into the RIN template.

***Public lighting***

- This section does not cover public lighting lamps
- TasNetworks interprets a public lighting bracket as a bracket which is dedicated to public lighting and owned by TasNetworks.
- TasNetworks interprets a public lighting pole/column as a pole dedicated to public lighting, owned by TasNetworks, irrespective of whether the Un-Metered Supply (UMS) type is 'public' or 'private'. This is not the same definition that is used for the Economic Benchmarking RIN.
- An extract of UMS data was taken from TasNetworks' spatial data warehouse. The query linked UMS that were supported by a pole to a pole tag, which enabled the pole material, installation date and owner of that pole to be retrieved.
- Poles were classified as columns if the pole material attribute was 'Steel-Other', otherwise they were classified as poles.
- Un-Metered Supplies were classified as major if the wattage of the lamp/luminaire was greater than 100W, otherwise they were classified as minor.
- Where no additional information was available, poles with no recorded material, voltage or installation date were distributed proportionally across the population of poles of the same type and installation date.

***SCADA, network control and protection systems***

- Field device numbers relate to the number of protection and SCADA schemes in zone substations, distribution building substations, and reclosers, LBS and sectionalisers. The corresponding scheme numbers have been sourced from recently added records in SAP.
- AFLC is assumed to denote Audio Frequency Load Control assets, of which TasNetworks has none.
- The asset numbers applied to the asset age profile differ from the asset numbers in the maintenance tables (2.8) due to a lack of installation dates on equipment. Hence the total number of SCADA and protection systems cannot be reconciled between these tables.

## Use of estimates

Unless specified below, no estimates have been used in the collation and presentation of this information;

TasNetworks distribution asset installation date has been captured in full date format since 2010. Prior to 2010, only the year values are stored in the database. Where there is no full installation date the quantity of the asset is weighted between the financial years based on the install year date; and

TasNetworks has not captured installation dates of some asset categories until recently. In these circumstances, estimates of those assets' ages have been made for the purposes of asset age profiling.

***Poles***

Where there is no voltage and no material information, the poles are distributed across the RIN categories based on the proportion of poles in the RIN categories for which this information is known. Where no voltage information was available, those poles were categorised by voltage in proportion with the breakdown of poles with the same pole material. All poles in the system have been allocated to a RIN category.

For poles where the age information is not available, the age of these poles are distributed proportionally across the population according to the volumes of poles where age is known, for each RIN category.

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| | The volume of poles for which age information must be estimated is approximately 5 per cent of the total population of poles.<br>***Overhead conductors***<br>TasNetworks' implemented a project to better estimate the age of the HV conductors in the distribution network. A schema was developed in the Spatial Data Warehouse to store the information of estimated age, through live connections to GIS data. Where possible, the age of conductors are assigned the values of the age of the poles, to which they are connected. Where age data cannot be calculated through this method, these conductors are proportionally assigned the ages of conductor populations whose ages are known.<br>LV Service spans are excluded from LV overhead conductor but are included in Services overhead conductor.<br>Only HV lines overhead conductor owned by TasNeworks are reported.<br>***Underground cables***<br>TasNetworks does not have reliable historical records of the installation date of HV or LV cables. TasNetworks' implemented a project to better estimate the age of the HV cables in the distribution network;<br>For HV cables, a GIS connectivity trace was used to determine the physical asset, to which the cable is connected. The age of the cable is assumed to be equal to the age of the asset, to which it is connected;<br>For LV cables, a model similar to TasNetworks' vegetation span model was developed to create a low voltage connectivity model. This model is also used to determine the connectivity of LV cables, where possible, to the transformers to which they are connected. The age of LV cables is approximated as the age of the transformer from which the cable is supplied; and<br>Where the ages of these assets are not known, cables are assigned ages proportionally, from the population of cables, whose age is known.<br>***Service lines***<br>Recorded asset information regarding LV services is limited. TasNetworks currently captures whether a line is located overhead or underground and its voltage, but does not include size, material, type or installed date. While installation dates from TasNetworks' NMI records would be TasNetworks' preferred proxy for the installation date of a service line, this information could not be used for the purposes of this RIN due to issues with installation dates requiring validation. Therefore, the age of the pole to which a service line is connected was deemed an acceptable substitute methodology until NMI installation dates become available;<br>Geomedia was used to undertake spatial analysis and return the age of the pole and the number of LV services that were close to that pole;<br>A query of TasNetworks' NMI installation data was used to determine the proportion of residential NMIs, commercial and industrial NMIs;<br>Services associated with poles for which no installation date (year) was available were distributed proportionally across the rest of the population. The proportions of residential versus commercial/industrial were then applied to the age profile to give values for each type of installation;<br>LV services are assumed to be the same age as the nearest pole;<br>LV service numbers are a count of the number of services, not the length of those services;<br>All services are <= 11 kV and are simple connections; and<br>The proportion of service lines supplying residential customers as opposed to commercial and industrial services is deemed to be the same as indicated by the proportion of NMIs associated with each broad customer category.<br>***Switchgear***<br>Asset information regarding overhead switchgear is limited. Where switchgear age is undeterminable, it has been mapped to a pole and its install date used as a proxy. The |

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| | residual volume of switchgear with no install dates have been distributed across the install years utilising a ratio split. The ratio calculation utilises the switchgear where the voltage is identifiable.<br>***Public lighting***<br>TasNetworks has limited data relating to the installation date of individual luminaires. Age data for lights with no install date was estimated using procurement records or by interviewing employees involved historically with the installation of lighting assets. The volumes of lights installed in each year was given a flat profile for the period each particular light was purchased by TasNetworks;<br>To identify public lighting brackets, TasNetworks' public lighting pole data was queried to identify all UMSs that are installed on poles that do not have unique pole tags. This count was distributed proportionally across the population of poles of the same type and installation date where no additional information was available; and<br>Public lighting brackets are assumed to be the same age as the pole.<br>***SCADA, network control and protection systems***<br>Where actual installation dates are not provided but the original electromechanical relay is still installed, the installation date is assumed to be the same as the substation or transformer.<br>Where installation dates are not available for the complete substation and subsequently the secondary equipment, the assets are not included in any age based calculations such as average asset age or the age profile. |

# Template 5.3 Maximum demand at network level

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| **Table 5.3.1: Raw and weather corrected coincident MD at network level** | **Consistency of information with the requirements of the RIN**<br>information has been provided regarding maximum demand at network level in accordance with the requirements and definitions of the RIN |
| | **Source of information**<br>Information has been sourced from:<br>• TasNetworks NEM Metering and Billing System (**MABS**) and SCADA data retrieval (**eDNA**) tools<br>  o Raw demand data<br>• (TasNetworks) Probability of exceedance data preparation tool<br>  o Temperature corrected data<br>• (TasNetworks) Distribution metering tool<br>  o Embedded generation data |
| | **Methodology and assumptions made**<br>***Assumptions***<br>• 8.3 Seasonality of maximum demand<br>The seasonality of distribution network-level maximum demand does not correspond with regulatory years. The maximum demand occurs during winter, whereas regulatory years are financial years. Therefore the 2019–20 maximum demand reported is that from 2019 winter (across April–September, as per RIN definitions)<br>• 8.4 Network level<br>The network level maximum demand is defined as the maximum demand on the distribution network. It is the maximum demand recorded at distribution network entry |

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| | points, being transmission-distribution connection points and distribution lines supplied directly from power stations (i.e. at Gordon and Wayatinah power stations)<br>• 8.5 Embedded generation<br>Embedded generation is included for private large HV medium voltage connections. All embedded generation is non-scheduled generation.<br>• 8.6 Weather corrected data<br>Weather corrected data is calculated through our business-as-usual methodology and calculated in the TasNetworks Probability of exceedance and diversity factor data preparation tool.<br>***Methodology***<br>• Raw demand data at connection point level for winter is extracted from MABS OLAP and eDNA tools.<br>• Maximum demand value is calculated, with date, time, and season recorded<br>• Probability of exceedance (**POE**) values obtained from TasNetworks POE data preparation tool. Network POE value methodology is to correct each value using local weather data (seasonal relationship, effective temperature a relationship of 0.8x (current day minimum) + 0.2x (previous day maximum)) to the POE value, then summated to the network total.<br>• Embedded generation contribution at time of maximum demand is downloaded. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 5.4 Maximum demand at spatial level

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| **Table 5.4.1: Non-coincident and coincident maximum demand** | **Consistency of information with the requirements of the RIN**<br>Information has been provided regarding maximum demand at spatial level in accordance with the requirements and definitions of the RIN. |
| | **Source of information**<br>Information has been sourced from:<br>• TasNetworks Annual Planning Report 2019<br>  o Network segment asset ratings<br>• TasNetworks eDNA tool<br>  o Raw demand data<br>• TasNetworks POE data preparation tool<br>  o Temperature corrected data<br>• TasNetworks Distribution metering tool<br>  o Embedded generation data |
| | **Methodology and assumptions made**<br>***Assumptions***<br>• 8.3 Seasonality of maximum demand<br>The seasonality of network segment maximum demands does not correspond with regulatory years. Majority of network segment maximum demands occur during winter calendar season, whereas regulatory years are financial years. Therefore the 2019–20 |

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| | connection point maximum demands reported are from 2019 winter and 2019–20 summer (across April–September and October–March, respectively, as per RIN definitions).<br>• 8.7 Network segments<br>The indicated network segments (network levels) in the template are 'subtransmission substation' and 'zone substation'. What we refer to as zone substations in our network, and are consistent with the definition of zone substation in NER Section 5.10.2, does not meet the definition of substransmission substation or zone substation in the RIN requirements. Trial Harbour Zone Substation – 44/22 kV – is an exception, however we have defined others – all 33/11 kV – as zone substations for the purposes of the RIN template. The remainder of this section uses 'zone substation' in place of 'network segment'.<br>In Tasmania, the majority of the distribution network (as exclusive to the sub-transmission network) is supplied directly from transmission substations at 44, 22, 11, and 6.6 kV. Though meeting the RIN definition of voltage levels for a zone substation, they are not included in this section as they are not part of the distribution network. For this reason, the coincident maximum demand of zone substations does not match the distribution network-level maximum demand.<br>• 8.11 Zone substation rating<br>Zone substation rating is given as normal cyclic rating, as defined in the RIN requirements. We have no cyclic rating attribute for supply transformers at zone substations, however do apply a 30% short-term factor to the continuous rating. That factor has been used in reporting the zone substation rating in this template.<br>• 8.12 Embedded generation<br>Embedded generation is included for private large HV medium voltage connections. All embedded generation is non-scheduled generation.<br>• 8.13 Weather corrected data<br>Weather corrected data is calculated through our business-as-usual methodology and calculated in the TasNetworks Probability of exceedance and diversity factor data preparation tool. Weather corrected data maximum demand figures are based on raw adjusted maximum demand.<br>• 8.14 Coincident data<br>In reporting coincident data, the system (network) peak is taken as that reported in RIN Template 5.3.<br>***Methodology***<br>• Seasonal zone substation demand profile extracted from eDNA tool. Summate the demands for zone substations where demand has multiple recording points<br>• Identify column reference and data point (as used by POE tool for connection points) for each zone substation raw data 'lookups'<br>• Lookup non-coincident and coincident connection point ratings from raw data and apply 30% cyclic rating factor (as per assumption provided above)<br>• Lookup non-coincident maximum demand and coincident demand (MW) from winter and summer seasonal raw data. Date and time of system (network) maximum demand taken directly from value obtained in RIN Template 5.3<br>• Calculate MVA at time of MW maximum demand from lookup MW and associated MVAr value<br>• Lookup date and time of MW non-coincident maximum demand from raw data, separated to date, time, and season<br>• Lookup embedded generation contribution at times of non-coincident and coincident maximum demand from raw data<br>• Lookup weather-corrected MW data from raw data. Weather-corrected MVA values are determined by applying the raw data power factor to the weather-corrected MW value – this is done as we do not weather-correct reactive (MVAr) demand. |

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| | • POE values obtained from TasNetworks Probability of exceedance data preparation tool. For both non-coincident and coincident data, each zone substation is corrected using local weather data (seasonal relationship, effective temperature a relationship of 0.8x (current day minimum) + 0.2x (previous day maximum)) to the POE value.<br>***Additional data to be provided in BOP***<br>The RIN requires data be published in the basis of preparation that is additional to that provided in the regulatory templates. Those data requirements are published here.<br>• 8.7 (a) Network segments decommissioned<br>This requirement is to note instances where components of the network belonging to network segments—i.e. subtransmission and zone substations—have been decommissioned.<br>We have not decommissioned any zone substations in the initial or subsequent regulatory years.<br>• 8.8 MVA maximum demand<br>This requirement is to enter MVA maximum demands where they occurred at a different time to the MW maximum demand. MVA at the time of MW maximum demand is included in the regulatory template.<br>The MVA maximum demand occurred at the same time as the MW maximum demand at all zone substations in the 2019–20 regulatory year. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |

# Template 6.3 Sustained interruptions to supply

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| **Table 6.3.1: Sustained interruptions to supply** | **Consistency of information with the requirements of the RIN**<br>Information has been presented for sustained interruptions to supply in accordance with the definitions and requirements of the RIN in that.<br>• Interruptions have been defined as loss of electricity supply to a customer associated with an outage of any part of the electricity supply network, including generation facilities and transmission networks, of more than 0.5 seconds, including outages affecting a single premises; and<br>• The customer interruption starts when recorded by equipment such as SCADA or, where such equipment does not exist, at the time of the first customer call relating to the network outage. An interruption may be planned or unplanned, momentary or sustained. Subsequent interruptions caused by network switching during fault finding are not recorded as additional outages. An interruption ends when supply to the last customer is restored.<br>• Network SAIDI and SAIFI are calculated in accordance with the STPIS guidelines<br>• The Major Event Day threshold calculated in accordance with the 2.5ß methodology. |
| | **Source of information**<br>• InService (Outage Management System)<br>• NOCS |

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| | **Methodology and assumptions made**<br>• All reliability performance indices (SAIDI and SAIFI) have been calculated using disconnected customers and customer duration at the time of the outage.<br>• All outages for the current reporting period on mainland Tasmania (i.e. excluding Unmetered Supply and Bass Strait Islands) have been captured, with the outages' impact measured on the basis of disconnected customers and customer duration as per the RIN requirements.<br>• The data was then cleansed to ensure completeness of customers disconnected and customer durations. All outages were manually inspected to identify issues and information sourced from InService.<br>• TasNetworks' outage categories were then mapped to the AER's categories and applied to the outage data.<br>• An extract of Major Event Days was taken from the current Annual Reporting RIN response and cross referenced with outage data to determine the outages that occurred on major event days.<br>• TasNetworks is unable to determine the causes of many momentary interruptions.<br>• Momentary interruptions caused by reclosers are automatically captured by TasNetworks' automatic download process for devices where communications are available. Momentary interruptions on circuit breakers are extracted from NOCS on a quarterly basis.<br>• A query was run to extract all momentary outages on TasNetworks' distribution network for the current reporting period with the outage impact measured by disconnected customers, in line with TasNetworks' STPIS reporting requirements and Category RIN reporting requirements. Disconnected customers are based on network configuration at the time of running the query, not the configuration at the time of the interruption as the MAIFI calculation relies on TasNetworks' protection zone model, which is refreshed each day and does not store changes.<br>• All momentary outages have been assumed to be unknown causes and have no duration associated with them as they are less than 1 minute in duration.<br>• Events were grouped by day, time, feeder number and feeder classification. |
| | **Use of estimates**<br>No estimates have been used in the collation and presentation of this information. |


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