



TransGrid

# Regulatory Information Notice

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Economic Benchmarking 2018/19

16 October 2019

# Contents

<b>Contents</b> .....	<b>2</b>
<b>1. Introduction</b> .....	<b>3</b>
<b>2. Compliance with the RIN Requirements</b> .....	<b>4</b>
<b>3. Preparation Process</b> .....	<b>6</b>
3.1 Document Control.....	6
3.2 Governance .....	6
<b>4. Principles of Preparation</b> .....	<b>7</b>
<b>5. Information Sources</b> .....	<b>8</b>
<b>6. Confidentiality Claims</b> .....	<b>10</b>
<b>7. Detailed Basis of Preparation</b> .....	<b>11</b>
7.1 Contents Worksheet .....	11
7.2 Worksheet 1.0 Business & Other Details .....	11
7.3 Worksheets 3.1 to 3.7.....	11
7.3.1 Worksheet 3.1 Revenue .....	12
7.3.2 Worksheet 3.2 Operating Expenditure .....	16
7.3.3 Worksheet 3.2.3 Provisions .....	17
7.3.4 Worksheet 3.3 Assets (RAB).....	25
7.3.5 Worksheet 3.4 Operational Data .....	34
7.3.6 Worksheet 3.5 Physical Assets .....	48
7.3.7 Worksheet 3.6 Quality of Services .....	52
7.3.8 Worksheet 3.7 Operating Environment Factors .....	82

# 1. Introduction

TransGrid operates and manages the major high voltage electricity transmission network in NSW and the ACT as a transmission network service provider, connecting generators, distributors and major end users.

TransGrid is the trading name for the NSW Electricity Networks Operations Pty Ltd (ACN 609 169 959) as a Trustee for the NSW Electricity Networks Operations Trust (ABN 70 250 995 390). Prior to 16 December 2015, it was a State Owned Corporation (SOC) owned by the NSW government.

On 7 March 2014, the Australian Energy Regulator (AER) issued TransGrid with a Regulatory Information Notice Under Division 4 of Part 3 of the National Electricity (New South Wales) Law (the 'RIN'), requiring the business to prepare and submit certain information to support the AER's regulatory responsibilities.

This Basis of Preparation document has been prepared to support the audited information package that is due to be submitted to the AER by 31 October 2019. The whole RIN package is comprised of:

1. The populated worksheets provided as Appendix A to the RIN;
2. The Basis of Preparation for each variable covered in the RIN worksheets, including any Confidentiality Claims (this document);
3. Audit & Review Report by the independent auditor provided as Appendix B to the RIN
4. Verification of the information by way of a Statutory Declaration in the form provided as Appendix C to the RIN.

## 2. Compliance with the RIN Requirements

The Economic Benchmarking RIN outlines the requirements for the Basis of Preparation as follows:

### 3. BASIS OF PREPARATION

3.1 *TransGrid must explain, the basis upon which TransGrid prepared information to populate the input cells (basis of preparation), for all information in the following regulatory templates 2.1 Expenditure Summary' to '2.11 Provisions', and '2.13 Insurance & Self-insurance' and '2.15 Step changes, and '4.1 Asset Age Profile' to '4.3 MD & utilisation-spatial', and '5.1(a) ECFM' and '5.1(b) EBSS', '5.2. STPIS' and '6.4. Shared assets'.*

3.2 *The basis of preparation must be a separate document (or documents) that TransGrid submits with its completed regulatory templates.*

3.3 *The basis of preparation must follow a logical structure that enables auditors, assurance practitioners and the AER to clearly understand how TransGrid has complied with the requirements of this Notice.*

3.4 *At a minimum, the basis of preparation must:*

*(a) demonstrate how the information provided is consistent with the requirements of the Notice;*

*(b) explain the source from which TransGrid obtained the information provided;*

*(c) explain the methodology TransGrid used to provide the required information, including any assumptions TransGrid made; and*

*(d) explain circumstances where TransGrid cannot provide input for a variable using actual information, and therefore must provide estimated information:*

*(i) why an estimate was required, including why it was not possible for TransGrid to use actual information;*

*(ii) the basis for the estimate, including the approach used, assumptions made and reasons why the estimate is TransGrid's best estimate, given the information sought in the Notice.*

3.5 *TransGrid may provide additional detail beyond the minimum requirements if TransGrid considers it may assist a user to gain an understanding of the information presented in the regulatory templates.*

3.6 *When reporting an audit opinion or making an attestation report on the regulatory templates presented by TransGrid, an auditor or assurance practitioner shall opine or attest by reference to TransGrid's basis of preparation.*

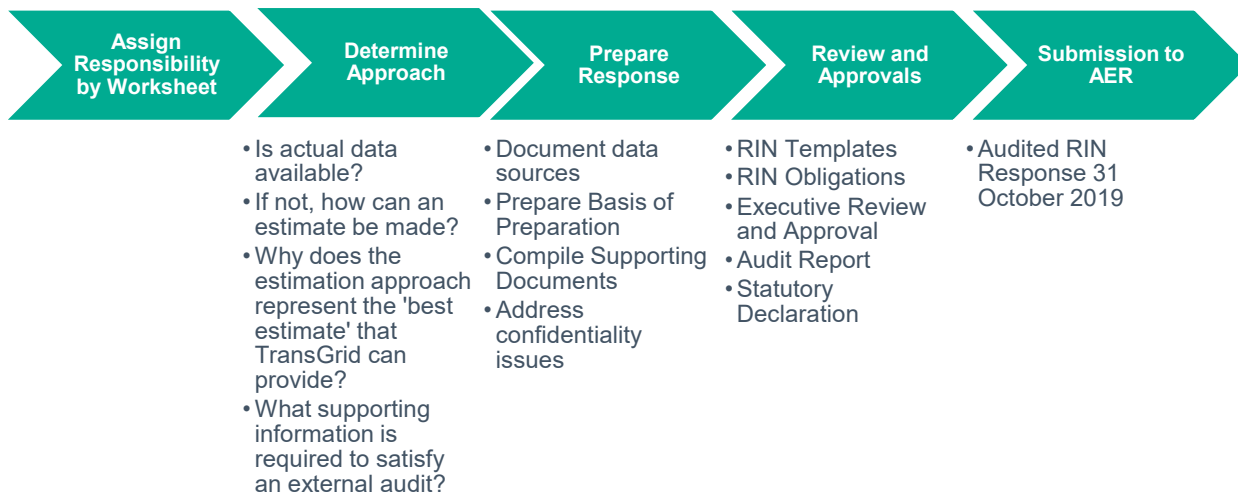
To promote a common approach across the business to addressing the requirements of the Economic Benchmarking RIN, TransGrid has gathered information from across the business using a template prepared to respond to each of the AER's requirements. This is outlined in the table below.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition <sup>1</sup> ?	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
'Variable_Code' & 'Variable' from worksheet	If AER definition is not clear, document TransGrid interpretation and its rationale  <b>Responds to RIN requirement a)</b>	Specify source systems, reports, forms, other RIN variables etc  <b>Responds to RIN Requirement b)</b>	Yes/No  If estimate is used for this variable, document: <ul style="list-style-type: none"> <li>Why an estimate was required, including why it was not possible to use Actual Financial Information or Actual Non-Financial Information</li> <li>Estimate basis, including the approach used, assumptions made and reasons why the estimate is TransGrid's best estimate</li> </ul> <b>Responds to RIN Requirement d)</b>	Clear description of approach steps / methodology  <b>Responds to RIN Requirement c)</b>	Clearly describe any assumptions used and the rationale for each  <b>Responds to RIN Requirement c)</b>

<sup>1</sup> 'Information presented in response to the Notice whose presentation is not Materially dependent on information recorded in the NSP's historical accounting records or other records used in the normal course of business, and whose presentation for the purposes of the Notice is contingent on judgments and assumptions for which there are valid alternatives, which could lead to a Materially different presentation in the response to the Notice.', page 34, "Economic benchmarking RIN For transmission network service providers, Instructions and Definitions".

# 3. Preparation Process

TransGrid’s high level process for preparing its response to the RIN is outlined below.



## 3.1 Document Control

The RIN Templates, Basis of Preparation and supporting documents for the Annual RINs are located on TransGrid’s file servers. These documents will be retained to support the preparation of the annual information required in future years.

## 3.2 Governance

The information required under the RIN has been prepared by the responsible personnel within TransGrid, termed “data collectors”, who populate the RIN templates and the relevant sections of the Basis of Preparation. This information is then reviewed internally to check the validity of the data collected by “data reviewer”. “Data approvers” provide sign-offs to individual sections of the RINs and the associated BOPs. This internally verified information is presented to the auditors, PwC, who then verify the information with data collectors and other relevant persons within TransGrid. A management representation letter is provided to the auditor (PwC) on accuracy of data, and validity of estimates as the best available by TransGrid.

## 4. Principles of Preparation

TransGrid's response to the RIN has been prepared in accordance with the AER issued "*Regulatory Information Notice Under Division 4 of Part 3 of the National Electricity (New South Wales) Law*" to TransGrid.

In accordance with the AER's instructions TransGrid has provided actual information using 'records used in the normal course of business' wherever this is possible.

Where TransGrid has been unable to provide actual information, the variables have been estimated as follows:

- > In the first instance, where actual information exists, but the presentation is contingent of a judgement or assumption, TransGrid has used actual information to prepare the variable and stated the judgement or assumption that has been made.
- > Where actual information exists, but the information is incomplete over the time period or by the categories required by the RIN, TransGrid has used the actual information as far as practicable and stated the methodology used to estimate the remaining data.
- > Where no actual information is recorded for the variable in the normal course of business, TransGrid has stated the methodology that it has used to estimate the variable required by the AER, including the assumptions made and the data sources used.

By following these principles of preparation, TransGrid considers that where estimates have been provided, these represent the best estimate available for each variable, noting that considerable uncertainty remains with respect to the AER's specific purpose(s) for the information.

TransGrid has prepared the schedules in compliance with the requirements of Accounting Standard AASB 108 Accounting Policies, Changes in Accounting Estimates and Errors and in compliance with the recognition, measurement and classification requirements of other relevant Accounting Standards mentioned above. To the extent determined appropriate, the RIN schedules have been prepared in compliance with the disclosure requirements of the relevant Accounting Standards.

## 5. Information Sources

Due to the combination of financial and non-financial data requested by the AER, including a number of items that are not routinely reported, TransGrid has drawn data from a large number of information sources that are used across its business. In most cases it has been necessary to undertake additional analysis to derive the specific information that is required in the RIN response.

The key systems and information sources that have been relied on are summarised in the table below, and are referred to, in the detailed basis of preparation tables in section 7.

Information Source	Brief Description	Supports
<b>AEMO Settlement Statements</b>	AEMO issued statements for intraregional and interregional settlement residues.	Worksheet 3.1 Revenue
<b>AEMO Connection Point Forecast</b>	AEMO connection point forecasts are used in applying weather correction for non-coincident maximum demand	Worksheet 3.4 Operational data
<b>AEMO EFI</b>	Electricity Forecasting Insights by Australian Energy Market Operator (AEMO), used for applying weather correction for system maximum demand	Worksheet 3.4 Operational Data
<b>AEMO MMS Database</b>	AEMO's Market Management System Database, which contains data relating to National Electricity Market (NEM) constraints. The software package ez2view (developed by Global Roam) acts as a front-end to this database, enabling extraction of data.	Worksheet 3.6 Quality of Services
<b>AER Current Period Determination</b>	The AER's final determination for the 2018/19 to 2022/23.	Worksheet 3.1 Revenue, Worksheet 3.3 Assets (RAB)
<b>AER Roll Forward Model</b>	AER's Roll Forward Model populated by capex and disposals data from the Regulatory Accounts provided to the AER	Worksheet 3.3 Assets (RAB)
<b>AER STPIS Letters</b>	Annual letters from the AER confirming the revenue attributable to the Service Target Performance Incentive Scheme	Worksheet 3.1 Revenue
<b>Bush Fire Prone Lands</b>	Spatial data set sourced from NSW Rural Fire Service	Worksheet 3.7 Operating Environment
<b>Climate Zone Map</b>	Spatial data set sourced from the Australian Bureau of Meteorology	Worksheet 3.7 Operating Environment
<b>Ellipse</b>	TransGrid's corporate asset management database	Worksheet 3.5 Physical Assets, Worksheet 3.7 Operating Environment
<b>Invoices Received</b>	Contractor invoices received for vegetation management works have been used to estimate the variables requested	Worksheet 3.7 Operating Environment
<b>LAN</b>	TransGrid's corporate IT network	Various (Document Locations)
<b>LiDAR</b>	Light Detection and Ranging data sourced from aerial surveys that is used to measure vegetation clearances from TransGrid's transmission line assets.	Worksheet 3.7 Operating Environment
<b>Maintenance Plans</b>	Used for the operation and maintenance of TransGrid's assets, these outline equipment information, standard practices and maintenance requirements.	Worksheet 3.7 Operating Environment
<b>Network Performance Review</b>	Internal report on outages that is generated each month from the THEOS System	Worksheet 3.6 Quality of Services



<b>Spot Height Data (25m)</b>	Topographical information sourced from NSW Land and Property Information.	Worksheet 3.7
<b>System Operating Diagrams</b>	High Voltage Operating Diagrams detail in plan view, single line format, the high voltage equipment, operational nomenclature and electrical connections for substations, switching stations and power station switchyards	Worksheet 3.5 Physical Assets
<b>TransGrid Spatial System (TSS) – formerly TAMIS</b>	NSW Transmission System and TransGrid Asset Management Information System (TAMIS) is the Geographical Information System (GIS) used by TransGrid to manage its spatial asset data.  The formal name of the TAMIS system has recently been changed to TSS.	Worksheet 3.5 Physical Assets, Worksheet 3.7 Operating Environment
<b>TransGrid Regulatory Accounts</b>	TransGrid's annual Regulatory Accounts which are prepared and submitted in accordance with the AER's requirements.	Worksheet 3.2 Opex, Worksheet 3.2.3 Provisions
<b>TransGrid Electrical Data Book</b>	A central record of electrical asset data regarding TransGrid's network that is published on the TransGrid Intranet.	Worksheet 3.5 Physical Assets Worksheet 3.7 Operating Environment
<b>TransGrid Operating Manuals</b>	Operating Manuals for TransGrid's assets outlining ratings for assets in each region of TransGrid's network.	Worksheet 3.5 Physical Assets
<b>TRIM</b>	TransGrid's corporate document management system	Various (Document Locations)
<b>TUOS System</b>	Transmission Use of System (TUOS) charges are TransGrid's primary source of revenue.  The TUOS System is the billing system that underpins TransGrid's invoicing and records the information from the various metering installations deployed across TransGrid's network.	Worksheet 3.1 Revenue Worksheet 3.4 Operational Data Worksheet 3.5 Physical Assets Worksheet 3.7 Operating Environment
<b>The Wire</b>	TransGrid's Intranet	Various (Document Locations)
<b>THEOS</b>	TransGrid's outage recording/reporting system	Worksheet 3.6 Quality of Services
<b>TransGrid Manuals &amp; Policies</b>	Used for the operation and maintenance of TransGrid's assets, these outline equipment information, standard practices and maintenance requirements.	Worksheet 3.5 Physical Assets Worksheet 3.7 Operating Environment

## 6. Confidentiality Claims

Data affected	Description	Topic	Category	Reasoning for category	Why disclosure would be detrimental, and why this outweighs benefits
<b>Worksheet 3.1 Revenue:</b> <b>3.1.1 Revenue grouping by chargeable quantity:</b> <b>TREV0105 and TREV0106</b>	<p>This data relates directly to individual customers annual transmission charges.</p> <p>i.e. It can be used to identify individual customers.</p>	Revenue	Personal Information	<p>RIN categorisation enables identification of:</p> <ol style="list-style-type: none"> <li>1. Customer loads for directly connected customers; and</li> <li>2. Customers receiving prudent discounts and the annual prudent discount charge for each customer.</li> </ol>	<p>Disclosure of this information concerning directly connected customers provides market data that may impact their business performance. There is no benefit from disclosing this information.</p> <p>Prudent discount contracts are commercial in confidence. The details are not publically disclosed. There are no benefits from disclosing this information.</p>
<b>Worksheet 3.4 Operational Data:</b> <b>TOPED0103 to TOPD0112 To directly connected end-users</b>	<p>Certain TransGrid BSPs are predominantly (or exclusively) connected to direct customers.</p>	Load	<p>Personal Information</p> <p>Other</p>	<p>RIN categorisation enables identification of:</p> <ol style="list-style-type: none"> <li>1. Customer loads for directly connected customers</li> </ol>	<p>NSWEN's Transmission Operator's License included mandatory provisions in relation to keeping customer data confidential</p>

# 7. Detailed Basis of Preparation

The following sections outline the Basis for Preparation for each line item in the RIN Templates.

## 7.1 Contents Worksheet

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The Contents Worksheet does not require any input by TransGrid.

## 7.2 Worksheet 1.0 Business & Other Details

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Worksheet 1.0 Business & Other Details requires general business address and contact information.

## 7.3 Worksheets 3.1 to 3.7

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The Basis of Preparation outlines the necessary explanations with regards to the preparation of the RIN template, as per section 2 above.

7.3.1 Worksheet 3.1 Revenue

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.1.1 REVENUE GROUPING BY CHARGEABLE QUANTITY</b>					
TREV0101 From Fixed Customer (Exit Point) Charges	Connection Exit charges for distributors & direct connect customers based on fixed daily rate	From invoices generated by the Pricing team on the monthly basis using a core business TUOS billing system. Revenue from these invoices are summarised in the TUOS Data spreadsheets to facilitate internal financial reporting.	No	<p>Prices for all customer connection points are calculated annually as per the AER approved Pricing Methodology.</p> <p>MAR is calculated as per the CPI-X methodology as outlined in the National Electricity Rules 6A.5.3(b)(5).</p> <p>Approved prices by the EM/Regulation are published on TransGrid's website by 15 March. These (prices) are entered into the TUOS billing system and invoices for all customers are generated each month using the TUOS billing system.</p>	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TREV0102 From Variable Customer (Exit Point) Charges	This type of charge is not applicable for TransGrid, all exit charges are on fixed basis above	N/A	No	N/A	N/A
TREV0103 From Fixed Generator (Entry Point) Charges	Connection Entry charges for generators based on fixed daily rate	As per TREV0101	No	As per TREV0101	N/A
TREV0104 From Variable Generator (Entry Point) Charges	This type of charge is not applicable for TransGrid, all entry charges are on fixed basis above	N/A	No	N/A	N/A
TREV0105 From Fixed Energy Usage Charges (Charge per day basis)	Charges applied for a direct connect customer.	As per TREV0101	No	As per TREV0101	N/A
TREV0106 From Variable Energy Usage charges (Charge per kWh basis)	Energy based (per kWh rate) usage charges from loads customers.	As per TREV0101	No	As per TREV0101	N/A
TREV0107 From Energy based Common Service and General Charges	Energy based (per kWh rate) Common Service and Non-locational TUOS (previously called General Charges) from all loads customers.	N/A	N/A	N/A	N/A
TREV0108 From Fixed Demand based Usage Charges	Revenue from charges based on annual maximum demand	As per TREV0101	No	As per TREV0101	N/A
TREV0109 From Variable Demand based Usage Charges	Demand based (per kW rate) usage charges from all loads customers.	As per TREV0101	No	As per TREV0101	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TREV0110 Revenue from other Sources	Intra-regional residues and Inter-regional Settlement residues auction proceeds, net financial transfers per TREV0201, net adjustments of network support pass through amounts, revenue deferral and under/over collection adjustment for financial year.	From AEMO settlement statements, issued transmission service invoices, revenue reconciliations	No	Other Revenue (TREV0205) + Revenue from Other Connected transmission Systems (TREV0201)	N/A

### 3.1.2 REVENUE GROUPING BY TYPE OF CONNECTED EQUIPMENT

TREV0201 From Other connected transmission networks	Net of financial transfers to & from other NSW/ACT market region TNSPs, and net inter-regional TUOS. (This includes Evoenergy, Ausgrid, Directlink and the net MLEC charge to Powerlink Queensland and AEMO Victoria.).	As per TREV0101	No	As per TREV0101	N/A
TREV0202 From Distribution networks	Total amount charged to Evoenergy, Ausgrid, Essential Energy, Endeavour Energy less financial transfers in TREV0201	As per TREV0101	No	As per TREV0101	N/A
TREV0203 From Directly connected end-users	Total amounts charged to direct customers	As per TREV0101	No	As per TREV0101	N/A
TREV0204 From Generators	Total connection Entry charges for generators	As per TREV0101	No	As per TREV0101	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TREV0205 Other revenue	Intra-regional residues and Inter-regional Settlement residues auction proceeds net adjustments of network support pass through amounts, revenue deferral and under/over collection adjustment for financial year	From AEMO settlement statements, issued transmission service invoices, revenue reconciliations	No	AEMO email a Final Settlements report each week with the intra-regional and inter-regional settlements figures, as well as a settlement residue auctions report on a quarterly basis. These figures are compiled into the Settlement residues spreadsheet. This forms part of the monthly account reconciliation process, confirming that the data within the spreadsheet is correct.	N/A
<b>3.1.3 REVENUE (penalties) ALLOWED (deducted) THROUGH INCENTIVE SCHEMES</b>					
TREV0301 EBSS	AER Approved EBSS revenue for the current regulatory year (\$,nominal)	Current regulatory determination (current regulatory year) - using forecast inflation as per the PTRM	No	N/A	N/A
TREV0302 STPIS	AER Approved STPIS revenue for calendar year (i.e. 2017 calendar year for FY19).	Approval letter from AER	No	N/A	N/A
TREV0303 Other	AER Approved CESS revenue for the current regulatory year (\$,nominal)	Current regulatory determination (current regulatory year) - using forecast inflation as per the PTRM	No	N/A	N/A
TREV03 Total revenue of incentive schemes	Total of TREV0301, TREV0302 and TREV0303.	N/A	No	TREV0301 + TREV0302 + TREV0303.	N/A

### 7.3.2 Worksheet 3.2 Operating Expenditure

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.2.1 OPEX CATEGORIES</b>					
<p>Table 3.2.1 Current opex categories and cost allocations</p> <p>TOPEX0101 Maintenance – Lines &amp; Cable To TOPEX0120 Network Support</p>	<p>The Opex line items reported are consistent with TransGrid's Revenue proposal opex line items and definitions, with the exception of TOPEX0119 Defined Benefit Superannuation Adjustment. TOPEX0119 relates to an adjustment made to reverse out the Defined Benefit superannuation cash contribution in Prescribed Opex and added back the Defined Benefit superannuation accounting expense for compliance with Australian Accounting Standard AASB 119.</p> <p>As required by the "Economic Benchmarking RIN for TNSP Instructions and Definitions Nov 2013", opex line items reported in Table 3.2.1 align with the Opex line items reported in the Regulatory Accounting Statements which are prepared in accordance with Australian Accounting Standards.</p> <p>Prescribed Opex in Table 3.2.1 is equal to the following Ellipse P&amp;L categories:</p> <ul style="list-style-type: none"> <li>- Labour</li> <li>- Materials</li> <li>- Operating Expenses</li> <li>- Statutory &amp; External Charges</li> <li>- Support Costs</li> <li>- Defined Benefit Super Adjustment</li> <li>- Grid support payments</li> </ul>	<p>2018-19 Regulatory Accounts 'DISAGG Opex', 'RFS Inc Network' and DISAGG Inc' templates – Prescribed column. Categories of the Regulatory Account templates can be mapped to the EB 3.2 as follows:</p> <ul style="list-style-type: none"> <li>- Network Maintenance – TOPEX0101 to TOPEX0105</li> <li>- Network Operations – TOPEX0106 to TOPEX0108</li> <li>- Other Controllable Costs – TOPEX0109 to TOPEX0118</li> <li>- Defined Benefit Superannuation Adjustment – TOPEX0119</li> <li>- Network Support TOPEX0120</li> </ul>	No	<p>Prepared in accordance with the requirements of the annual Regulatory Accounts.</p> <p>The source data is extracted from Ellipse and re-categorised into regulatory categories based on Responsibility Centres, Activity Centres and Expense Element codes.</p>	<p>Figures reconcile to the Regulatory accounts</p>



### 7.3.3 Worksheet 3.2.3 Provisions

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.2.3 Provisions</b>					
<b>TOPEX03A Long Service Leave</b>					
Opening balance	Last year's closing balance	Last year's closing balance	No	Last year's closing balance	N/A
Additional provisions - opex component	<p>The provision breakdowns are consistent with the audited financial statements for FY19 prepared in accordance with Australian Accounting Standards.</p> <p>The capex components exclude contingent capex projects.</p>	<p>FY19 audited Financial Statements and Ellipse General Ledger for the long service leave provision and the working papers used for the preparation of the Regulatory Accounts 'DISAGG ProvSum' schedule. (Including only the prescribed portion and excluding contingent capex).</p>	No	<p>The additional provisions made in the period and amounts used in the period are allocated to Prescribed Services based on the labour oncosts costed to prescribed activities (excluding contingent capex).</p>	N/A
Additional provisions - capex component					
Additional provisions - other component					
Amounts used - opex component					
Amounts used - capex component					
Amounts used - other component					
Unused amounts reversed - opex component					
Unused amounts reversed - capex component					

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Unused amounts reversed - other component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - opex component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - capex component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - other component					
Closing balance					
<b>TOPEX03B Annual Leave</b>					
Opening balance	Last year's closing balance	Last year's closing balance	No	Last year's closing balance	N/A
Additional provisions - opex component	The provision breakdowns are consistent with the audited financial statements for FY19 prepared in accordance with Australian Accounting Standards.	FY19 audited Financial Statements and Ellipse General Ledger for annual leave provision and the working papers used for the preparation of the Regulatory Accounts 'DISAGG ProvSum'	No	The additional provisions made in the period and amounts used in the period are allocated to	N/A
Additional provisions - capex component					

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Additional provisions - other component	The capex components exclude contingent capex projects.	schedule. (Including only the prescribed portion and excluding contingent capex).		Prescribed Services based on the labour oncosts costed to prescribed activities (excluding contingent capex).	
Amounts used - opex component					
Amounts used - capex component					
Amounts used - other component					
Unused amounts reversed - opex component					
Unused amounts reversed - capex component					
Unused amounts reversed - other component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - opex component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - capex component					

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - other component					
Closing balance					
<b>TOPEX03C Defined Benefit Superannuation Scheme</b>					
Opening balance	Last year's closing balance	Last year's closing balance	No	Last year's closing balance	N/A
Additional provisions - opex component	The provision breakdowns are consistent with the audited financial statements for FY19 prepared in accordance with Australian Accounting Standards.	FY19 audited Financial Statements and Ellipse General Ledger translated into the working papers for the preparation of the Regulatory Accounts 'DISAGG ProvSum' schedule. (Including only the prescribed portion).	No	The additional provision movement was costed directly to Prescribed Opex in the General Ledger and the amount used against the provision was treated as Prescribed Opex consistent with the costing for the additional provision movement. Actuarial gains/losses were costed directly to	N/A
Additional provisions - capex component					
Additional provisions - other component					
Amounts used - opex component					
Amounts used - capex component					
Amounts used - other component					

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Unused amounts reversed - opex component				Equity in the General Ledger and shown as 'Other component' in the 'Unused amounts reversed during the period' section in the RIN schedule.	
Unused amounts reversed - capex component					
Unused amounts reversed - other component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - opex component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - capex component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - other component					
Closing balance					
<b>TOPEX03D Employee Incentives</b>					
Opening balance	Last year's closing balance	Last year's closing balance	No	Last year's closing balance	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Additional provisions - opex component	The provision breakdowns are consistent with the audited financial statements for FY19 prepared in accordance with Australian Accounting Standards.	FY19 audited Financial Statements and Ellipse General Ledger for the Incentives provision and the working papers used for the preparation of the Regulatory Accounts 'DISAGG ProvSum' schedule. (Including only the prescribed portion).	No	The additional provisions made in the period and amounts used in the period are allocated to Prescribed Services based on the labour oncosts costed to prescribed activities.	N/A
Additional provisions - capex component					
Additional provisions - other component					
Amounts used - opex component					
Amounts used - capex component					
Amounts used - other component					
Unused amounts reversed - opex component					
Unused amounts reversed - capex component					
Unused amounts reversed - other component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - opex component					

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - capex component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - other component					
Closing balance					

TOPEX03E Rectification Obligations					
Opening balance	No opening value as this provision relates to rectification obligation in FY19.	No opening value as this provision relates to rectification obligation in FY19.	No	No opening value as this provision relates to rectification obligation in FY19.	N/A
Additional provisions - opex component	The provision breakdowns are consistent with the audited financial statements for FY19 prepared in accordance with Australian Accounting Standards.	FY19 audited Financial Statements and Ellipse General Ledger for Provision for Rectification Obligation	No	The provision recognised in the FY19 audited financial statements relates wholly to Prescribed Services.	N/A
Additional provisions - capex component					
Additional provisions - other component					

Amounts used - opex component					
Amounts used - capex component					
Amounts used - other component					
Unused amounts reversed - opex component					
Unused amounts reversed - capex component					
Unused amounts reversed - other component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - opex component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - capex component					
The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate - other component					
Closing balance					



### 7.3.4 Worksheet 3.3 Assets (RAB)

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.3.1 REGULATORY ASSET BASE VALUES (for total asset base)</b>	<b>As per Instruction and Definition provided by the AER.</b>	<b>Electricity Transmission Network Service Provider Roll Forward Model (RFM), with TransGrid information</b>	<b>No</b>	<p>Prepared in accordance with the requirements of the AER Determination.</p> <p>This is the sum of all the "Asset Category" below.</p> <p>"As Commissioned" RAB used.</p> <p>Expenditure balances in the schedule includes a provisions to cash adjustment.</p>	<p>Classified expenditure into asset classes in line with activity centre (WIP AC) used in RFM/PTRM. Where asset classes does not exist in WIP AC (e.g. secondary systems, cables and transmission line life extension), TransGrid has used % allocation consistent with latest Capital Asset Model (CAM)/PTRM per the AER final revenue determination for the 2018-2023 period.</p> <p>The 2018/19 opening RAB uses the closing RAB based on forecast capex for 2017/18 to align with final decision RFM.</p>
TRAB0101 Opening value	as above	as above	as above	as above	as above
TRAB0102 Inflation addition	as above	as above	as above	as above	as above
TRAB0103 Straight line depreciation	as above	as above	as above	as above	as above
TRAB0105 Actual additions (recognised in RAB)	as above	as above	as above	as above	as above
TRAB0106 Disposals	as above	as above	as above	as above	as above
TRAB0107 Closing value	as above	as above	as above	as above	as above

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
3.3.2 ASSET VALUE ROLL FORWARD	As per Instruction and Definition provided by the AER.	Electricity Transmission Network Service Provider Roll Forward Model (RFM), with TransGrid information	No	<p>Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used. In the RFM, the categories that are noted as "Transmission Lines" and "Transmission Lines Life Extension".</p> <p>Expenditure balances in the schedule includes a provisions to cash adjustment.</p>	<p>Classified expenditure into asset classes in line with activity centre (WIP AC) used in RFM/PTRM. Where asset classes does not exist in WIP AC (eg secondary systems, cables and transmission line life ext), TransGrid has used % allocation consistent with latest CAM/PTRM per the AER final revenue determination for the 2018-2023 period.</p> <p>The 2018/19 opening RAB uses the closing RAB based on forecast capex for 2017/18 to align with final decision RFM.</p>
<b>FOR OVERHEAD TRANSMISSION ASSETS</b>					
TRAB0201 Opening value	as above	as above	as above	as above	as above
TRAB0202 Inflation addition	as above	as above	as above	as above	as above
TRAB0203 Straight line depreciation	as above	as above	as above	as above	as above
TRAB0205 Actual additions (recognised in RAB)	as above	as above	as above	as above	as above
TRAB0206 Disposals	as above	as above	as above	as above	as above
TRAB0207 Closing value	as above	as above	as above	as above	as above

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>FOR UNDERGROUND TRANSMISSION ASSETS</b>	As per Instruction and Definition provided by the AER.	Electricity Transmission Network Service Provider Roll Forward Model (RFM), with TransGrid information	No	<p>Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used In the RFM, the categories that are noted as "Underground Cables"</p> <p>Expenditure balances in the schedule includes a provisions to cash adjustment.</p>	<p>Classified expenditure into asset classes in line with activity centre (WIP AC) used in RFM/PTRM. Where asset classes does not exist in WIP AC (eg secondary systems, cables and transmission line life extension) we used % allocation consistent with latest CAM/PTRM per the AER final revenue determination for the 2018-2023 period.</p> <p>The 2018/19 opening RAB uses the closing RAB based on forecast capex for 2017/18 to align with final decision RFM.</p>
TRAB0301 Opening value	as above	as above	as above	as above	as above
TRAB0302 Inflation addition	as above	as above	as above	as above	as above
TRAB0303 Straight line depreciation	as above	as above	as above	as above	as above
TRAB0305 Actual additions (recognised in RAB)	as above	as above	as above	as above	as above
TRAB0306 Disposals	as above	as above	as above	as above	as above
TRAB0307 Closing value	as above	as above	as above	as above	as above

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>FOR TRANSMISSION SWITCHYARDS, SUBSTATIONS</b>	As per Instruction and Definition provided by the AER.	Electricity Transmission Network Service Provider Roll Forward Model (RFM), with TransGrid information	No	<p>Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used</p> <p>In the RFM, the categories that are noted as "Substations"</p> <p>Expenditure balances in the schedule includes a provisions to cash adjustment.</p>	<p>Substations category does not include Substations land as this is included in easements. It is not possible to separate out the existing "land and easements" asset category between substation land and other.</p> <p>Classified expenditure into asset classes in line with activity centre (WIP AC) used in RFM/PTRM. Where asset classes does not exist in WIP AC (eg secondary systems, cables and transmission line life ext), TransGrid has used % allocation consistent with latest CAM/PTRM per the AER final revenue determination for the 2018-2023 period.</p> <p>The 2018/19 opening RAB uses the closing RAB based on forecast capex for 2017/18 to align with final decision RFM.</p>
TRAB0401 Opening value	as above	as above	as above	as above	as above
TRAB0402 Inflation addition	as above	as above	as above	as above	as above
TRAB0403 Straight line depreciation	as above	as above	as above	as above	as above
TRAB0405 Actual additions (recognised in RAB)	as above	as above	as above	as above	as above
TRAB0406 Disposals	as above	as above	as above	as above	as above
TRAB0407 Closing value	as above	as above	as above	as above	as above

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>FOR EASEMENTS</b>	As per Instruction and Definition provided by the AER.	Electricity Transmission Network Service Provider Roll Forward Model (RFM), with TransGrid information	No	Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used in the RFM, the categories that are noted as "Land and Easements"  Expenditure balances in the schedule includes a provisions to cash adjustment.	Substations category does not include Substations land as this is included in easements. It is not possible to separate out the existing "land and easements" asset category between substation land and other.  The 2018/19 opening RAB uses the closing RAB based on forecast capex for 2017/18 to align with final decision RFM.
TRAB0501 Opening value	as above	as above	as above	as above	as above
TRAB0502 Inflation addition	as above	as above	as above	as above	as above
TRAB0503 Straight line depreciation	as above	as above	as above	as above	as above
TRAB0505 Actual additions (recognised in RAB)	as above	as above	as above	as above	as above
TRAB0506 Disposals	as above	as above	as above	as above	as above
TRAB0507 Closing value	as above	as above	as above	as above	as above

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>FOR "OTHER" ASSETS WITH LONG LIVES</b>	As per Instruction and Definition provided by the AER.	Electricity Transmission Network Service Provider Roll Forward Model (RFM), with TransGrid information	No	<p>Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used in the RFM, the categories that are noted as "SCADA and Communications", "SMHEA Assets", "Secondary Systems", "Communications", "Communications (short life)", "Equity Raising Costs"</p> <p>Expenditure balances in the schedule includes a provisions to cash adjustment.</p>	<p>Classified expenditure into asset classes in line with activity centre (WIP AC) used in RFM/PTRM. Where asset classes does not exist in WIP AC (e.g. secondary systems, cables and transmission line life ext), TransGrid has used % allocation consistent with latest CAM/PTRM per the AER final revenue determination for the 2018-2023 period.</p> <p>The 2018/19 opening RAB uses the closing RAB based on forecast capex for 2017/18 to align with final decision RFM.</p>
TRAB0601 Opening value	as above	as above	as above	as above	as above
TRAB0602 Inflation addition	as above	as above	as above	as above	as above
TRAB0603 Straight line depreciation	as above	as above	as above	as above	as above
TRAB0605 Actual additions (recognised in RAB)	as above	as above	as above	as above	as above
TRAB0606 Disposals	as above	as above	as above	as above	as above
TRAB0607 Closing value	as above	as above	as above	as above	as above

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>FOR "OTHER" ASSETS WITH SHORT LIVES</b>	As per Instruction and Definition provided by the AER.	Electricity Transmission Network Service Provider Roll Forward Model (RFM), with TransGrid information	No	<p>Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used in the RFM, the categories that are noted as "Non-network Assets", "Business IT", "Minor Plant", "Motor Vehicles &amp; Mobile Plant"</p> <p>Expenditure balances in the schedule includes a provisions to cash adjustment.</p>	<p>Classified expenditure into asset classes in line with activity centre (WIP AC) used in RFM/PTRM.</p> <p>The 2018/19 opening RAB uses the closing RAB based on forecast capex for 2017/18 to align with final decision RFM.</p>
TRAB0701 Opening value	as above	as above	as above	as above	as above
TRAB0702 Inflation addition	as above	as above	as above	as above	as above
TRAB0703 Straight line depreciation	as above	as above	as above	as above	as above
TRAB0705 Actual additions (recognised in RAB)	as above	as above	as above	as above	as above
TRAB0706 Disposals	as above	as above	as above	as above	as above
TRAB0707 Closing value	as above	as above	as above	as above	as above

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.3.3 TOTAL DISAGGREGATED RAB ASSET VALUES</b>	As per Instruction and Definition provided by the AER.	Electricity Transmission Network Service Provider Roll Forward Model (RFM), with TransGrid information	No	This is calculated as the average of the opening and closing RAB values for the Regulatory Year for each RAB Asset Category as per Page 22 of the Instruction.	Classified expenditure into asset classes in line with activity centre (WIP AC) used in RFM/PTRM. Where asset classes does not exist in WIP AC (eg secondary systems, cables and transmission line life ext), TransGrid has used % allocation consistent with latest CAM/PTRM per the AER final revenue determination for the 2018-2023 period.  The 2018/19 opening RAB uses the closing RAB based on forecast capex for 2017/18 to align with final decision RFM.
TRAB0801 Overhead transmission assets (wires and towers/poles etc)	as above	as above	as above	as above	as above
TRAB0802 Underground transmission assets (cables, ducts etc)	as above	as above	as above	as above	as above
TRAB0803 Substations, switchyards, transformers etc with transmission function	as above	as above	as above	as above	as above
TRAB0804 Easements	as above	as above	as above	as above	as above
TRAB0805 "Other" assets with long lives	as above	as above	as above	as above	as above
TRAB0806 "Other" assets with short lives	as above	as above	as above	as above	as above
<b>3.3.4 ASSET LIVES</b>					
<b>ASSET LIVES - ESTIMATED SERVICE LIFE OF NEW ASSETS</b>	As per Instruction and Definition provided by the AER	AER Final Determination 18-23 Attachment 5 - regulatory depreciation - May 2018 (page 9)	No	Calculation for Weighted Average Asset lives of new assets for each asset category, in	N/A



Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
				accordance with Page 22 of the Instruction.	
TRAB0901 Overhead transmission assets	as above	as above	as above	as above	as above
TRAB0902 Underground transmission assets	as above	as above	as above	as above	as above
TRAB0903 Switchyard, substation and transformer assets	as above	as above	as above	as above	as above
TRAB0904 "Other" assets with long lives	as above	as above	as above	as above	as above
TRAB0905 "Other" assets with short lives	as above	as above	as above	as above	as above
<b>ASSET LIVES - ESTIMATED RESIDUAL SERVICE LIFE</b>	<b>Straight-line depreciation for the year reflects the use of the regulated asset base by the relevant categories below</b>	<b>N/A</b>	<b>No</b>	<b>This is calculated using Opening Asset Value divided by depreciation for the year, based on the figures in Table 3.3.2</b>	<b>ASSET LIVES - ESTIMATED RESIDUAL SERVICE LIFE</b>
TRAB1001 Overhead transmission assets	as above	as above	as above	as above	as above
TRAB1002 Underground transmission assets	as above	as above	as above	as above	as above
TRAB1003 Switchyard, substation and transformer assets	as above	as above	as above	as above	as above
TRAB1004 "Other" assets with long lives	as above	as above	as above	as above	as above
TRAB1005 "Other" assets with short lives	as above	as above	as above	as above	as above

### 7.3.5 Worksheet 3.4 Operational Data

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.4.1 - ENERGY DELIVERY</b>					
<b>Energy Grouping by Downstream Connection type</b>					
TOPED0101 To Other connected transmission networks	Energy supplied to transmission networks in adjacent NEM regions (i.e. flows related to interconnectors). Both exports and imports have been considered, with each being added for the four relevant interconnectors. Flows to other transmission networks have been taken to be flows to adjacent NEM Regions. Flows to other transmission networks within the NSW region of the NEM (to networks owned by DNSPs) have been included in "Flows to Distribution Networks"	TransGrid's TUOS billing system	No	Data have been obtained from revenue or statistical 15 minute metering registrations. For each of the categories, those 15 minute data have been summated to obtain figures for each regulatory (financial) year. Energy calculations involve spreadsheets which sum the 15 minute registrations for the relevant period(s) and make any adjustments to achieve the appropriate units of measurement (for example, dividing by 1,000 to convert from kWh to MWh) Energy flow to other TNSPs was found by summing up interconnector imports and exports to or from TransGrid's network, irrespective of direction of flow. These are at Jindera-Wodonga, Buronga-Red Cliffs, and Murray-Dederang to Victoria and QNI to Queensland.	DNSP transmission assets are not included in this calculation.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPED0102 To Distribution networks	Energy supplied to the distribution networks has been taken to be the energy supplied to the distributors in NSW and the ACT. Energy supplied to customers directly connected via dedicated connections owned by third parties such as a DNSP are included in TOPED0103.	TransGrid's TUOS billing system	No	This was calculated as the summation of energy flows leaving TransGrid's network. Data have been obtained from revenue or statistical 15 minute metering registrations. For each of the categories, those 15 minute data have been summated to obtain figures for each regulatory (financial) year. Energy calculations involve spreadsheets which sum the 15 minute registrations for the relevant period(s) and make any adjustments to achieve the appropriate units of measurement (for example, dividing by 1,000 to convert from kWh to MWh).	Energy supplied to the distribution networks has been taken to be the energy supplied to the distributors in NSW and the ACT, even though parts of Ausgrid's and Essential Energy's networks are considered to serve a transmission function.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPED0103 to TOPD0112 To directly connected end-users	Energy supplied to customers directly connected via dedicated connections owned by third parties such as a DNSP (excluding customers whose identity could be deduced from the voltage of supply – Reported in TOPED0102) Aggregated data for customers supplied at 132 kV has been provided.	TransGrid's TUOS billing system	No	This was calculated as the energy flows to each of the industrial loads connected at 330kV, 220kV and 132 kV.	Includes some industrial loads connected via dedicated feeders owned by DNSPs
TOPED0113 Pumping and Power Station Auxillaries	Energy supplied to pumps and power station auxiliaries	TransGrid's TUOS billing system	No	This was calculated as the energy flows to major pumps and generator auxiliaries from the transmission network.	None

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPED01 Total energy transported	The total (gross) energy delivered by TransGrid's network at the locations where it connects to other party's networks.	TransGrid's TUOS billing system	No	Summation of metered energy delivered at the individual locations within each category. TOPED0101 includes both exports from and imports to TransGrid's network.	Other connected networks have been taken to be interconnections to adjacent states. Distribution networks have been taken to be DNSP networks, even though some parts of those networks may serve a transmission function. End-use customers directly connected via dedicated assets owned by a third party have been taken to be "Directly connected end-users".

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable

### 3.4.2 CONNECTION POINTS

#### Number of entry points at each transmission voltage level

TOPCP0101 to TOPCP0111 Number of entry points at each transmission voltage level	This variable is interpreted as locations of connections between TransGrid's network and generators at TransGrid's network at locations that have a Transmission Node Identifier (TNI).	Based on AEMO TNIs, as described in their documents giving marginal loss factors.	No	<p>At a particular location (such as a TransGrid substation):</p> <ul style="list-style-type: none"> <li>· TNIs are taken to define the node, and connection points are counted at the nominal connection voltage</li> <li>· Entry connections are generator only connections where TransGrid is the relevant TNSP.</li> <li>· Bidirectional flows across connection points not associated with generators are not classified an entry point</li> <li>· Where there is more than one TNI having the same voltage designation (such as for supplies to different customers or multiple generator connection) only one is counted. That is, there can only one connection point per voltage level at a particular location;</li> <li>· The voltage has been taken to be the designated voltage of the physical connection point associated with the TNI.</li> </ul> <p>The data for 2018-19 are the average of the numbers at the beginning and end of that financial year.</p>	TNIs which are not part of or directly connected to TransGrid's network have been excluded.
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Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>Number of exit points at each transmission voltage level</b>					
TOPCP0201 to TOPCP0212 Number of exit points at each transmission voltage level	This variable is interpreted as locations of connections between TransGrid's network and networks of other parties, where real power can flow directly out of TransGrid's network and those locations have a Transmission Node Identifier (TNI).	Based on AEMO TNIs, as described in their documents giving marginal loss factors	No	<p>At a particular location (such as a TransGrid substation):</p> <ul style="list-style-type: none"> <li>· TNIs are taken to define the node, and connection points are counted at the nominal connection voltage</li> <li>· Entry connections are generator only connections where TransGrid is the relevant TNSP.</li> <li>· Bidirectional flows across connection points not associated with generators are classified an exit point</li> <li>· Interconnectors are classified as exit points</li> <li>· Where there is more than one TNI having the same voltage designation (such as for supplies to different customers or multiple customer connections) only one is counted. That is, there can only one connection point per voltage level at a particular location;</li> <li>· The voltage has been taken to be the designated voltage of the physical connection point associated with the TNI.</li> </ul> <p>The data for 2018-19 are the average of the numbers at the beginning and end of that financial year.</p>	TNIs which are not part of or directly connected to TransGrid's network have been excluded.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.4.3 SYSTEM DEMAND</b>					
<b>3.4.3.1 - Annual system maximum demand characteristics – MW measure</b>					
TOPSD0101 Transmission System coincident maximum demand	Raw network demand only in TransGrid's bulk supply points (BSPs) over rolling half hour periods on an as-delivered basis considered in identifying MD.	TransGrid's TUOS billing system	No	Transmission system coincident MD in TransGrid's network is calculated as the maximum of the summated rolling half hour period demands for each and every BSP and other locations within TransGrid's network. All half hours periods for all days within FY 2018-19 have been considered for calculation of this variable.	Reported to three significant figures Raw network demand only in TransGrid's BSPs over rolling half hour periods on an as-delivered basis considered in identifying MD.
TOPSD0102 Transmission System coincident weather adjusted maximum demand 10% POE	This is the network coincident maximum demand with weather correction applied to the raw maximum demand to obtain a 10% POE maximum demand	TransGrid's TUOS billing system	Yes	(TG NSW Region 10% POE/TG NSW Region RAW MD) x TransGrid RAW MD a) TransGrid RAW MD is the TransGrid raw network coincident MD b) TG NSW Region RAW MD is the NSW+ACT raw MD as reported by TG TAPR 2019, and c) TG NSW Region 10% POE is the 10% POE MD for NSW Region	TransGrid has started producing weather corrected maximum demands for the NSW Region (NSW+ACT). The source data (TransGrid RAW MD) is based on the TUOS billing system, and the weather correction from TransGrid's NSW Region Model. The response is materially dependent on the assumption that there is a consistent relationship between the native maximum demand of the NSW region of the NEM and the gross maximum demand delivered by TransGrid's network.



Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPSD0103 Transmission System coincident weather adjusted maximum demand 50% POE	This is the network coincident maximum demand with weather correction applied to the raw maximum demand to obtain a 50% POE maximum demand	TransGrid's TUOS billing system	Yes	(TG NSW Region 50% POE/TG NSW Region RAW MD) x TransGrid RAW MD a) TransGrid RAW MD is the TransGrid raw network coincident MD b) TG NSW Region RAW MD is the NSW+ACT raw MD as reported by TG TAPR 2019, and c) TG NSW Region 50% POE is the 50% POE MD for NSW Region	TransGrid has started producing weather corrected maximum demands for the NSW Region (NSW+ACT). The source data (TransGrid RAW MD) is based on the TUOS billing system, and the weather correction from TransGrid's NSW Region Model. The response is materially dependent on the assumption that there is a consistent relationship between the native maximum demand of the NSW region of the NEM and the gross maximum demand delivered by TransGrid's network.
TOPSD0104 Transmission System non-coincident summated maximum demand	This is the summation of raw maximum demands at TransGrid's downstream connection and supply locations irrespective of when they occur in the year.	TransGrid's TUOS billing system	No	Transmission system non-coincident summated MD in TransGrid's network is calculated as the summated rolling half hour period local maximum demands for each and every BSP and other locations within TransGrid's network. All half hours periods for all days within FY 2018-19 have been considered for calculation of this variable.	It has been assumed that all components of this total are to be calculated on a consistent basis, i.e. on an "as delivered" basis. Reported to three significant figures.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPSD0105 Transmission System non-coincident weather adjusted summated maximum demand 10% POE	This is the summation of the weather corrected MD at TransGrid's Down-stream connection and supply locations at the 10 % POE level irrespective of when they occur in the year.	TransGrid's TUOS billing system, AEMO Connection Point forecasts 2019	Yes	<p>The maximum demand for each BSP is calculated using: (AEMO BSP 10% POE/AEMO BSP RAW MD) x TransGrid adjusted BSP MD</p> <p>Where:</p> <p>a) "TransGrid adjusted BSP MD" refers to the raw adjusted MD for each BSP in the schedule  b) AEMO BSP RAW MD is the bulk supply point/connection point raw MD as reported by AEMO; and  c) AEMO BSP 10% POE is the bulk supply point/connection point 10% POE MD as reported by AEMO.</p> <p>The figure is adjusted (as per CA RIN 5.4) for load transfers where appropriate. For certain industrial loads, no weather correction is made, as loads are not weather dependent.</p> <p>The corrected (non-coincident) maximum demand for each bulk supply point and other locations was then summed to obtain this variable.</p>	TransGrid does not produce weather corrected maximum demands for individual BSPs. The source data is based on TUOS billing system and 2018 AEMO Connection Point Forecast data containing weather corrected and raw maximum demand data.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPSD0106 Transmission System non-coincident weather adjusted summated maximum demand 50% POE	This is the summation of the weather corrected MD at TransGrid's Down-stream connection and supply locations at the 50 % POE level irrespective of when they occur in the year.	TransGrid's TUOS billing system, AEMO Connection Point forecasts 2019	Yes	<p>The maximum demand for each BSP is calculated using: (AEMO BSP 50% POE/AEMO BSP RAW MD) x TransGrid adjusted BSP MD</p> <p>Where:</p> <ul style="list-style-type: none"> <li>a) "TransGrid adjusted BSP MD" refers to the raw adjusted MD for each BSP in the schedule</li> <li>b) AEMO BSP RAW MD is the bulk supply point/connection point raw MD as reported by AEMO; and</li> <li>c) AEMO BSP 50% POE is the bulk supply point/connection point 50% POE MD as reported by AEMO.</li> </ul> <p>The figure is adjusted (as per CA RIN 5.4) for load transfers where appropriate. For certain industrial loads, no weather correction is made, as loads are not weather dependent.</p> <p>The corrected (non-coincident) maximum demand for each bulk supply point and other locations was then summed to obtain this variable.</p>	TransGrid does not produce weather corrected maximum demands for individual BSPs. The source data is based on TUOS billing system and 2018 AEMO Connection Point Forecast data containing weather corrected and raw maximum demand data.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.4.3.2 - Annual system maximum demand characteristics – MVA measure</b>					
TOPSD0201 Transmission System coincident maximum demand	This is the network coincident raw maximum demand , converted to MVA	Variables: TOPSD0101 TOPSD0301	Yes	Divide Transmission System Coincident Maximum Demand MW number (TOPSD0101) by Average Overall Network Power Factor (TOPSD0301) for conversion to MVA.	Accuracy is limited by the uncertainty inherent in the calculation of the average power factor. Refer to 'Note to TOPSD0201 and TOPSD0301'
TOPSD0202 Transmission System coincident weather adjusted maximum demand 10% POE	This is the the weather corrected network coincident maximum demand at the 10 % POE level. MW values are converted to MVA.	Variables: TOPSD0102 TOPSD0301	Yes	Divide Transmission System Coincident Maximum Demand 10% POE (TOPSD0102) by Average Overall Network Power Factor (TOPSD0301) for conversion to MVA.	As per TOPSD0201 The data is materially dependent on availability of MVAR data, and accuracy of power factor estimates in their absence.
TOPSD0203 Transmission System coincident weather adjusted maximum demand 50% POE	This is the network coincident weather corrected maximum demand at the 50% POE level at the time when this summation is greatest. MW values are converted to MVA.	Variables: TOPSD0103 TOPSD0301	Yes	Divide Transmission System Coincident Maximum Demand 50% POE (TOPSD0103) by Average Overall Network Power Factor (TOPSD0301) for conversion to MVA.	As per TOPSD0201 The data is materially dependent on availability of MVAR data, and accuracy of power factor estimates in their absence.
TOPSD0204 Transmission System non-coincident summated maximum demand	This is the actual unadjusted summation of actual raw maximum demand at TransGrid's downstream connection and supply locations irrespective of when they occur in the year. MW values are converted to MVA.	Variables: TOPSD0104 TOPSD0301	Yes	Divide Transmission System non-coincident weather summated maximum demand (TOPSD0104) by Average Overall Network Power Factor (TOPSD0301) for conversion to MVA.	As per TOPSD0201 The data is materially dependent on availability of MVAR data, and accuracy of power factor estimates in their absence.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPSD0205 Transmission System non-coincident weather adjusted summated maximum demand 10% POE	This is the weather corrected summation of MD at TransGrid's downstream connection and supply locations (i.e. individual BSPs) at 10% POE level, irrespective of when they occur in the year. MW values are converted to MVA.	Variables: TOPSD0105 TOPSD0301	Yes	Divide Transmission System non-coincident weather adjusted summated maximum demand 10% PoE (TOPSD0105) by Average Overall Network Power Factor Conversion between MVA and MW (TOPSD0301) for conversion to MVA.	As per TOPSD0201 The data is materially dependent on availability of MVA data and accuracy of power factor estimates in their absence.
TOPSD0206 Transmission System non-coincident weather adjusted summated maximum demand 50% POE	This is the weather corrected summation of maximum demand at TransGrid's downstream connection and supply locations at 50% POE level, irrespective of when they occur in the year. MW values are converted to MVA.	Variables: TOPSD0106 TOPSD0301	Yes	Divide Transmission System non-coincident weather adjusted summated maximum demand 50% PoE (TOPSD0106) by Average Overall Network Power Factor Conversion between MVA and MW TOPSD0301.	As per TOPSD0201 The data is materially dependent on availability of MVA data and accuracy of power factor estimates in their absence.
<b>3.4.3.2 - POWER FACTOR Power factor conversion between MVA and MW</b>					
TOPSD0301 Average overall network power factor conversion between MVA and MW	Total system MW divided by total system MVA, as on day of TransGrid network maximum demand	TransGrid's TUOS billing system	Yes	TransGrid does not collect data to derive network wide power factors. However, there is data for reactive loading at some (but not all) bulk supply points. This data has been used to develop a broad approximation of system wide power factors. Refer to note below.	Refer to 'Note to TOPSD0201 and TOPSD0301'

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPSD0302 to TOPSD0312 Average power factor conversion for lines, per voltage level	This variable has been taken to be the power factor derived from the aggregate MW and MVar flows, at the time of overall maximum demand, on TransGrid's lines which operate at the particular nominal voltage. Where TransGrid does not have any lines operating at a particular nominal voltage, the average power factor provided for those lines is unity.	TransGrid's SCADA system	Yes	Information on the MW and MVar flows at each end of TransGrid lines at the time of the overall network maximum MW loading were extracted from TransGrid's SCADA system. For lines operating at each nominal voltage the aggregate MW and MVar flows at the "sending end" (where real power flows into the line) and the "receiving end" (where real power flows out of the line) were calculated. The power factors of the aggregate sending end flows and the aggregate receiving end flows were calculated. The average of these two power factors was taken to be the average power factor for the lines operating at that nominal voltage.	The assumptions include that the measure: · Relates to MW and MVar flows at the time of the maximum MW loading on TransGrid's network, rather than being an average across the year. · Is based on the power factor of the aggregated MW and MVar flows on all TransGrid lines operating at a particular nominal voltage. TransGrid does not have any assets with metered MVars at 275kV, 110kV or lower. Hence these values of 1 are provided only in keeping with the RIN instructions.

Note to TOPSD0201 and TOPSD0301

The nature of transmission systems is that they are "better" at transmitting real power (MW) than reactive power (MVar)<sup>[1]</sup>. Consequently, reactive power needs (to manage voltage levels) are met on a local basis, rather than a network wide basis. This involves the installation of reactive plant (such as shunt capacitors, shunt reactors, statcoms and static VAr compensators) at strategic locations, as well as utilisation of the reactive generation/absorption capability of generators. In some circumstances reactive plant may be installed in "downstream" networks, rather than at bulk supply points, if there is also a need to manage voltage levels (or reactive power loadings) within those networks.

As network wide reactive loads and their derivative network wide power factors, are not used, TransGrid does not routinely collect data to derive them. However, TransGrid does have reactive loading data for some (but not all) bulk supply points. Those data have been used to develop a broad approximation of system wide power factors. This has been done by:

- Deriving the real and reactive power loads for individual bulk supply points where data are available and usable<sup>[2]</sup> at the time of overall maximum (MW) demand for on TransGrid's network; and
- Summating those individual bulk supply point demands to derive the diversified (coincident, as delivered) maximum demand on TransGrid's network and the associated power factor.

The real and corresponding reactive power loads at the individual bulk supply points are derived from revenue <sup>[3]</sup> and in some cases statistical metering data. Generally, the statistical metering uses the same class of metering instruments (current transformers, voltage transformers and meters) as the revenue metering at that site.

TransGrid's bulk supply points provide supply at a number of voltages (between 11 kV and 330 kV) with supply from most being at 66 kV or below. Those supplies are at what can be considered to be the "edges" of TransGrid's network. Thus power factor data at bulk supply points do not necessarily provide any meaningful information about the power factors in other parts of TransGrid's network. As the system average power factor is only a very broad estimate, the figure is given to two only significant figures (to avoid a false sense of precision).

<sup>[1]</sup> This stems from the fact that the reactance of transmission lines and transformers is typically several (to many) times greater than their resistance. This leads to the voltage drops associated with reactive power flows through those network elements being commensurately higher than those associated with real power flows. Consequently, it is much more difficult to meet reactive power needs from "remote" locations than is the case for real power needs. This leads to reactive power needs being met on a "more local" basis.

<sup>[2]</sup> At some locations the meters measure the real and reactive power flows on the customers lines supplied from the bulk supply point. In these cases, calculations are straight forward. At other locations, the meters measure the real and reactive power flows in the transformers at the bulk supply point. In these cases the reactive power flows are affected by any reactive plant connected to the low voltage busbar. Where reactive plant is also installed within the customer's networks, it is sometimes not possible to identify, and adjust for, the impact of TransGrid's reactive plant. Where this is the case, the particular bulk supply points have been excluded from the calculations.

<sup>[3]</sup> The accuracy requirements for revenue metering installations are specified in the National Electricity Rules.

### 7.3.6 Worksheet 3.5 Physical Assets

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.5.1 TRANSMISSION SYSTEM CAPACITIES</b>					
Table 3.5.1.1 Overhead network length of circuit at each voltage TPA0101 to TPA0109	Overhead line total length operating at each voltage.  TransGrid has no Transmission Line assets at 275kV, 110kV, 88kV, 22kV or lower.	PowerBI Report	No	The PowerBI gets asset information from Ellipse and geospatial (length etc) information from TSS, TransGrid's Geospatial Information System	No assumptions were made in calculations as the asset is static.  Circuits with sections of split phase arrangement are counted as a single length.  Lines are reported at their operating voltage, although they may be constructed suitable for operation at a higher voltage. The 33kV line is strung with double circuit 132kV structures; neither end terminates at a TransGrid substation.
Table 3.5.1.2 Underground cable circuit length at each voltage TPA0201 to TPA0211	Underground cable circuit length at each voltage.  TransGrid has no Underground Cable assets at 500kV, 275kV, 220kV, 110kV, or lower.	Electrical Data Book Project Records (EDMS)	No	TransGrid's Electrical Database (published as the Electrical Data Book) records the commissioning date of segments of transmission cable circuits. For high voltage cables within substations, the length of the cables has been estimated from project drawings	No assumptions were made in calculations as the asset is static.  Cables are reported at their operating voltage, although they may be constructed suitable for operation at a higher voltage.



Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 3.5.1.3 Estimated overhead network weighted average MVA capacity by voltage class TPA0301 to TPA0311	<p>This variable is interpreted as the sum of all {peak transmission circuit capacity × relevant circuit lengths} for all circuits at each voltage level, divided by the total circuit length for that voltage level.</p> <p>TransGrid has no Transmission Line assets at 275kV, 110kV, 88kV, 22kV or lower.</p>	<p>Uses other calculated value: TPA0101 to TPA0111</p> <p>TransGrid Operating Manuals:</p> <ul style="list-style-type: none"> <li>• OM304 Ratings of Main Grid Circuits</li> <li>• OM305 Ratings of Subsystem Circuits In Northern Region</li> <li>• OM 306 - Ratings Of Subsystem Circuits In Central Region</li> <li>• OM307 - Ratings of Subsystem Circuits In Southern Region</li> </ul> <p>TUOS for time of maximum demand determination</p> <p>For the 33kV line, as neither end terminates at a TransGrid substation the connection agreement was used.</p>	No	<p>Line ratings vary on time of year and time of day, TUOS was used to determine date/time of maximum demand and thus which rating to use. For FY19, the maximum demand was in January at 1600 hrs, so Summer day ratings were used. Note that FY18 RIN used Winter Night ratings.</p> <p>The "Normal MVA" ratings applicable for the time of maximum demand for each line were entered into a spreadsheet which multiplied the rating with the length of the line (obtained as part of the TPA0101 to TPA0111 calculation) to give a MVA × km value.</p> <p>The sum of the MVA × km values was then divided by the determined kilometres for the voltage class in TPA0101 to TPA0111.</p>	<p>Constrained values are included where applicable. E.g. A line rating may be constrained by terminal equipment (such as CT's, wavetraps, etc.). In this case the constrained value will be entered, not the line rating.</p> <p>Where the ratings are dependent on the load flow direction, the most likely direction will be shown. This is based on:</p> <ul style="list-style-type: none"> <li>• Load will be going away from Generator sites</li> <li>• Load is assumed to flow from the higher voltage site, or the site closest to the higher voltage network.</li> </ul>

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 3.5.1.4 Estimated underground network weighted average MVA capacity by voltage class TPA0401 to TPA0411	<p>This variable is interpreted as the sum of all {peak transmission circuit capacity × relevant circuit lengths} for all underground circuits at each voltage level, divided by the total underground circuit lengths at that voltage level.</p> <p>TransGrid has no Underground transmission Cable assets at 500kV, 275kV, 220 kV, 110kV or lower.</p>	<p>Uses other calculated value TPA0201 to TPA0211.</p> <p>TransGrid Operating Manual OM304 Ratings of Main Grid Circuits.</p> <p>TUOS for time of maximum demand determination</p>	No	<p>Cable ratings can vary on time of year, TUOS was used to determine date/time of maximum demand and thus which rating to use. For FY19, the maximum demand was in January at 1600 hrs, so Summer day ratings were used. Note that FY18 RIN used Winter Night ratings.</p> <p>The normal cyclic rating was multiplied by the length of the circuit to give an MVA × km value. The sum of the MVA × km values was then divided by the determined kilometres for the voltage class TPA0202 to TPA211 to determine a weighted average MVA.</p> <p>Note that a 19.7 km 330 kV cable was derated in FY17 due to backfill issues.</p>	It is assumed that the AER require Cyclic rating for underground cables
Table 3.5.1.5 Installed transmission system transformer capacity TPA0501 to TPA0506	<p>These were taken to be the sum of nameplate capacities of transformers with a primary winding voltage rating of 220 kV and above and not used to supply load directly.</p> <p><b>TPA0502 Terminal points to DNSP systems:</b> Transformers primarily used to directly supply DNSP load.</p> <p><b>TPA0503 Transformer capacity for directly connected end-users owned by the TNSP:</b></p>	<p>Ellipse: Equipment Register Tracing Data Nameplate Data</p> <p>System operating diagrams and amendments GM AS S1 009 and amendments – In-Service and Spare Power Transformers</p>	No	<ol style="list-style-type: none"> <li>For consistency, the Excel file '2019_Transformer_Worksheet_RIN_2019' is used for Economic Benchmarking RIN as well as Category Analysis</li> <li>The current register of all TransGrid's Transformers are exported from Ellipse (ERM) on June 30th 2019.</li> <li>The Transformer asset base is reviewed for invalid entries.</li> <li>The nameplate data has been collected from field surveys and Transformer datasheets.</li> </ol>	<p>When relocations were known to have occurred, it was assumed that transformers were moved at the end of a financial year and for a replacement, no overlap was shown.</p> <p>Spare transformers temporarily connected to facilitate project staging were considered as remaining as spares.</p> <p>The quoted year is assumed to be the second year of a financial</p>

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	<p>Transformers used to supply direct customers exclusively. Owned by TransGrid.</p> <p><b>TPA0504 Transformer capacity for directly connected end-users owned by the end-user:</b> Transformers used to supply direct customers exclusively. Owned by the customer. These transformers were separately identified and may not part of TransGrid's asset management system.</p> <p><b>TPA0505 Interconnector capacity:</b> These were taken to be transformers used to directly connect interstate. None were identified.</p> <p><b>TPA0506 Other:</b> Dedicated SVC/Reactor Transformers - Transformers used to connect SVC/Reactors to the network. They do not fit into any of the above categories</p>	and Reactors Equipment Manuals			<p>year period – e.g.: 2006 = 2005/2006.</p> <p>A frequency injection transformer located at Forbes (Asset ID: COSFB24K) was omitted. Its only function is for the injection of the DNSP ripple control into the network.</p> <p>Deer Park Transformers have been included under TPA0503 - Transformer Capacity for directly connected end-users owned by the TNSP. They are owned and maintained by TransGrid in Victoria. The substation connects Ausnet (TNSP) and PowerCor (DNSP) and it is outside of TransGrid network. It is considered as a non-regulated asset owned by TransGrid in our asset register.</p>
Table 3.5.1.6 Cold Spare Capacity TPA06	In service or cold standby transformers that are not connected to the network and are used as spares to cover against possible failure.	As for TPA05	No	System spares were cross checked using amendments of corporate document: <b>D2003/2182 In Service and Spare Power Transformers and Reactors.</b>	As for TPA05

### 7.3.7 Worksheet 3.6 Quality of Services

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.6.1 SERVICE COMPONENT</b>					
<b>Service Parameter 1 - Average circuit outage rate</b>					
TQS0101 Lines outage rate – fault	TQS0102 / TQS0103	Refer to RIN variables TQS0102 and TQS0103	No	$TQS0101 = TQS0102 / TQS0103$	NIL
TQS0102 Number of Lines fault outages	This variable is interpreted as the total number of instantaneous outages (fault outages as defined by the AER) on transmission line and/or underground cable circuits owned and operated by TransGrid. This measure has excluded outages (as defined in V5 of the AER STPIS) removed from the count.	The "QAPR Comment on Outage" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "NPR Outages List Linked Table" worksheet of spreadsheet RINB-36-01. The "QAPR Comment on Outage" Table in Statistics Backend.accdb is populated by importing data into it from THEOS (the business application used by Network Operations staff to record outage data). Each of these outage records in the Statistics Backend database is assigned with an AER code. Selecting the appropriate AER code occasionally requires obtaining additional information from Opslog (a separate business application used as a diary/logbook by Network Operators).	No	Every outage record in the "NPR Outages List Linked Table" worksheet of the RINB-36-01 spreadsheet whose AER code field (column L) is Z, and Component Type field (column P) is TL or UG, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01.	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0103 Number of defined Lines	This variable is interpreted as the total number (three phase equivalent) of transmission line and/or underground cable circuits owned and operated by TransGrid. This measure is an average number over twelve months in a calendar year.	The "tblCircuits_SettingData" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Equipment Count Linked Table" worksheet of spreadsheet RINB-36-01.  The data contained in the "tblCircuits_SettingData" table in Statistics Backend.accdb is regularly updated in an incremental manner, based on System Development Summaries and/or High Voltage Operating Diagrams released by the Network Operations group.	No	Every equipment record in the "Equipment Count Linked Table" worksheet of the RINB-36-01 spreadsheet whose Component field (column A) is TL or UG, has its AllCircuits count (column G) averaged across each month of the relevant calendar year.	Accuracy of the System Development Summary documents and/or High Voltage Operating Diagrams produced by the Network Operations group within TransGrid.
TQS0104 Transformer outage rate – fault	TQS0105 / TQS0106	Refer to RIN variables TQS0105 and TQS0106	No	TQS0104 = TQS0105 / TQS0106	NIL

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0105 Number of Transformer fault outages	This variable is interpreted as the total number of instantaneous outages (fault outages as defined by the AER) on transformers owned and operated by TransGrid. This measure has excluded outages (as defined in V5 of the AER STPIS) removed from the count.	The "QAPR Comment on Outage" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "NPR Outages List Linked Table" worksheet of spreadsheet RINB-36-01. The "QAPR Comment on Outage" Table in Statistics Backend.accdb is populated by importing data into it from THEOS (the business application used by Network Operations staff to record outage data). Each of these outage records in the Statistics Backend database is assigned with an AER code. Selecting the appropriate AER code occasionally requires obtaining additional information from Opslog (a separate business application used as a diary/logbook by Network Operators).	No	Every outage record in the "NPR Outages List Linked Table" worksheet of the RINB-36-01 spreadsheet whose AER code field (column L) is Z, and Component Type field (column P) is TX, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01.	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0106 Number of defined Transformers	This variable is interpreted as the total number (three phase equivalent) of transformers owned and operated by TransGrid. This measure is an average number over twelve months in a calendar year.	The "tblCircuits_SettingData" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Equipment Count Linked Table" worksheet of spreadsheet RINB-36-01.  The data contained in the "tblCircuits_SettingData" table in Statistics Backend.accdb is regularly updated in an incremental manner, based on System Development Summaries and/or High Voltage Operating Diagrams released by the Network Operations group.	No	Every equipment record in the "Equipment Count Linked Table" worksheet of the RINB-36-01 spreadsheet whose Component field (column A) is TX, has its AllCircuits count (column G) averaged across each month of the relevant calendar year.	Accuracy of the System Development Summary documents and/or High Voltage Operating Diagrams produced by the Network Operations group within TransGrid.
TQS0107 Reactive Plant outage rate – fault	TQS0108 / TQS0109	Refer to RIN variables TQS0108 and TQS0109	No	TQS0107 = TQS0108 / TQS0109	NIL

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0108 Number of Reactive plant fault outages	This variable is interpreted as the total number of instantaneous outages (fault outages as defined by the AER) on Reactors and Capacitors at 66kV and above, and Static VAR Compensators (SVCs) at all voltages, owned and operated by TransGrid. This measure has excluded outages (as defined in V5 of the AER STPIS) removed from the count.	The "QAPR Comment on Outage" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "NPR Outages List Linked Table" spreadsheet RINB-36-01. The "QAPR Comment on Outage" Table in Statistics Backend.accdb is populated by importing data into it from THEOS (the business application used by Network Operations staff to record outage data). Each of these outage records in the Statistics Backend database is assigned with an AER code. Selecting the appropriate AER code occasionally requires obtaining additional information from Opslog (a separate business application used as a diary/logbook by Network Operators).	No	Every outage record in the "NPR Outages List Linked Table" worksheet of the RINB-36-01 spreadsheet whose AER code field (column L) is Z, and Component Type field (column P) is CAP or RX or SVC, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01.	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid



Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0109 Number of defined Reactive Plant	This variable is interpreted as the total number (three phase equivalent) of reactors and capacitors at 66kV and above, and Static VAR Compensators (SVCs) at all voltages, owned and operated by TransGrid. This measure is an average number over twelve months in a calendar year.	The "tblCircuits_SettingData" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Equipment Count Linked Table" worksheet of spreadsheet RINB-36-01. The data contained in the "tblCircuits_SettingData" table in Statistics Backend.accdb is regularly updated in an incremental manner, based on System Development Summaries and/or High Voltage Operating Diagrams released by the Network Operations group.	No	Every equipment record in the "Equipment Count Linked Table" worksheet of the RINB-36-01 spreadsheet whose Component field (column A) is CAP or RX or SVC, has its AllCircuits count (column G) averaged across each month of the relevant calendar year.	Accuracy of the System Development Summary documents and/or High Voltage Operating Diagrams produced by the Network Operations group within TransGrid.
TQS0110 Lines outage rate – forced	TQS0111 / TQS0103	Refer to RIN variables TQS0111 and TQS0103	No	TQS0110 = TQS0111 / TQS0103	NIL

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0111 Number of Lines forced outages	This variable is interpreted as the total number of outages that are not instantaneous, however less than 24 hours' notice is given to the customer and/or AEMO (forced outages as defined by the AER) on transmission line and/or underground cable circuits owned and operated by TransGrid. This measure has excluded outages (as defined in V5 of the AER STPIS) removed from the count.	<p>The "QAPR Comment on Outage" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "NPR Outages List Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "QAPR Comment on Outage" Table in Statistics Backend.accdb is populated by importing data into it from THEOS (the business application used by Network Operations staff to record outage data). Each of these outage records in the Statistics Backend database is assigned with an AER code. Selecting the appropriate AER code occasionally requires obtaining additional information from Opslog (a separate business application used as a diary/logbook by Network Operators).</p>	No	Every outage record in the "NPR Outages List Linked Table" worksheet of the RINB-36-01 spreadsheet whose AER code field (column L) is E, and Component Type field (column P) is TL or UG, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01.	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid
TQS0112 Transformers outage rate – forced	TQS0113 / TQS0106	Refer to RIN variables TQS0113 and TQS0106	No	TQS0112 = TQS0113 / TQS0106	NIL

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0113 Number of Transformers forced outages	This variable is interpreted as the total number of outages that are not instantaneous, however less than 24 hours' notice is given to the customer and/or AEMO (forced outages as defined by the AER) on transformers owned and operated by TransGrid. This measure has excluded outages (as defined in V5 of the AER STPIS) removed from the count.	The "QAPR Comment on Outage" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "NPR Outages List Linked Table" spreadsheet RINB-36-01. The "QAPR Comment on Outage" Table in Statistics Backend.accdb is populated by importing data into it from THEOS (the business application used by Network Operations staff to record outage data). Each of these outage records in the Statistics Backend database is assigned with an AER code. Selecting the appropriate AER code occasionally requires obtaining additional information from Opslog (a separate business application used as a diary/logbook by Network Operators).	No	Every outage record in the "NPR Outages List Linked Table" worksheet of the RINB-36-01 spreadsheet whose AER code field (column L) is E, and Component Type field (column P) is TX, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01.	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid
TQS0114 Reactive Plant outage rate – forced	TQS0115 / TQS0109	Refer to RIN variables TQS0115 and TQS0109	No	$TQS0114 = TQS0115 / TQS0109$	NIL

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0115 Number of Reactive Plant forced outages	This variable is interpreted as the total number of outages that are not instantaneous, however less than 24 hours' notice is given to the customer and/or AEMO (forced outages as defined by the AER) on Reactors and Capacitors at 66kV and above, and Static VAr Compensators (SVCs) at all voltages, owned and operated by TransGrid. This measure has excluded outages (as defined in V5 of the AER STPIS) removed from the count.	The "QAPR Comment on Outage" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "NPR Outages List Linked Table" worksheet of spreadsheet RINB-36-01. The "QAPR Comment on Outage" Table in Statistics Backend.accdb is populated by importing data into it from THEOS (the business application used by Network Operations staff to record outage data). Each of these outage records in the Statistics Backend database is assigned with an AER code. Selecting the appropriate AER code occasionally requires obtaining additional information from Opslog (a separate business application used as a diary/logbook by Network Operators).	No	Every outage record in the "NPR Outages List Linked Table" worksheet of the RINB-36-01 spreadsheet whose AER code field (column L) is E, and Component Type field (column P) is CAP or RX or SVC, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01.	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>Service Parameter 2 - Loss of supply event frequency - number in ranges specified</b>					
TQS0116 Number of events greater than 0.05 system minutes per annum (X)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'X' threshold set by the AER for TransGrid (which is 0.05 system minutes) where the loss of supply also is greater than 0.05 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators).</p> <p>The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.05 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0117 Number of events greater than 0.1 system minutes per annum (X)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'X' threshold set by the AER for TransGrid (which is 0.05 system minutes) where the loss of supply also is greater than 0.1 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.1 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	<p>Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.</p>

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0118 Number of events greater than 0.2 system minutes per annum (X)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'X' threshold set by the AER for TransGrid (which is 0.05 system minutes) where the loss of supply also is greater than 0.2 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.2 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0119 Number of events greater than 0.25 system minutes per annum (X)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'X' threshold set by the AER for TransGrid (which is 0.05 system minutes) where the loss of supply also is greater than 0.25 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.25 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.



Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0120 Number of events greater than 0.3 system minutes per annum (X)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'X' threshold set by the AER for TransGrid (which is 0.05 system minutes) where the loss of supply also is greater than 0.3 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.3 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0121 Number of events greater than 0.5 system minutes per annum (X)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'X' threshold set by the AER for TransGrid (which is 0.05 system minutes) where the loss of supply also is greater than 0.5 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.5 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0122 Number of events greater than 0.75 system minutes per annum (X)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'X' threshold set by the AER for TransGrid (which is 0.05 system minutes) where the loss of supply also is greater than 0.75 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.75 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0123 Number of events greater than 1.0 system minutes per annum (X)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'X' threshold set by the AER for TransGrid (which is 0.05 system minutes) where the loss of supply also is greater than 1.0 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 1.0 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	<p>Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.</p>

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0124 Number of events greater than 0.05 system minutes per annum (Y)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'Y' threshold set by the AER for TransGrid (which is 0.25 system minutes) where the loss of supply also is greater than 0.05 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators).</p> <p>The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.25 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0125 Number of events greater than 0.1 system minutes per annum (Y)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'Y' threshold set by the AER for TransGrid (which is 0.25 system minutes) where the loss of supply also is greater than 0.1 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.25 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0126 Number of events greater than 0.2 system minutes per annum (Y)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'Y' threshold set by the AER for TransGrid (which is 0.25 system minutes) where the loss of supply also is greater than 0.2 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.25 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0127 Number of events greater than 0.25 system minutes per annum (Y)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'Y' threshold set by the AER for TransGrid (which is 0.25 system minutes) where the loss of supply also is greater than 0.25 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.25 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.



Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0128 Number of events greater than 0.3 system minutes per annum (Y)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'Y' threshold set by the AER for TransGrid (which is 0.25 system minutes) where the loss of supply also is greater than 0.30 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators).</p> <p>The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.3 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 *$ <p>(record MW demand) The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0129 Number of events greater than 0.5 system minutes per annum (Y)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'Y' threshold set by the AER for TransGrid (which is 0.25 system minutes) where the loss of supply also is greater than 0.5 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.5 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 *$ <p>(record MW demand) The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0130 Number of events greater than 0.75 system minutes per annum (Y)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'Y' threshold set by the AER for TransGrid (which is 0.25 system minutes) where the loss of supply also is greater than 0.75 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators).</p> <p>The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 0.75 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 * (\text{record MW demand})$ <p>The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0131 Number of events greater than 1.0 system minutes per annum (Y)	This is taken to be the number of unplanned outages in the relevant year entailing a loss of supply exceeding the 'Y' threshold set by the AER for TransGrid (which is 0.25 system minutes) where the loss of supply also is greater than 1.0 system minutes, subtracting any applicable exclusions as defined by the AER STPIS V5.	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators). The "Peak Demand" table in within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "Peak Demand Linked Table" worksheet of spreadsheet RINB-36-01. The "Peak Demand" Table in Statistics Backend.accdb is populated by manually entering peak demand data using information sourced from AEMO.</p>	No	<p>Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N is false) and whose system minute value (column AD) exceeds the 1.0 system minute threshold, is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01. The mathematical relationship between MWh and system minutes is:</p> $\text{MWh} = \text{system minutes} / 60 *$ <p>(record MW demand) The record MW demand was obtained from a spreadsheet on AEMO's website (shortcut RINB-36-02 &amp; extract RINB-36-03), in cell B25 of the "NSW_Sum" worksheet.</p>	<p>Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid. Accuracy of data from AEMO.</p>

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>Service Parameter 3 - Average outage duration</b>					
TQS0118 Average outage duration	This is the average duration in minutes of all unplanned outages in a given year involving a loss of supply, which are not excluded (as defined by the AER STPIS V5).	<p>The "ENS Lost Load" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "ENS Lost Load Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "ENS Lost Load" Table in Statistics Backend.accdb is populated by manually entering data into it using information sourced from THEOS (the business application used by Network Operations staff to record outage data) and/or Opslog (a separate business application used as a diary/logbook by Network Operators).</p>	No	Every outage record in the "ENS Lost Load Linked Table" worksheet of the RINB-36-01 spreadsheet which is not excluded (i.e. column N contains FALSE), has its Lost Load Time Hrs (column E) averaged across the relevant calendar year. This is subsequently multiplied by 60 to convert from hours to minutes, which forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01.	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>Service Parameter 4 - Proper operation of equipment - number of failure events</b>					
TQS0119 Failure of protection system	Number of events in a given year where the protection system does not operate for a fault or operates where there is no actual fault.	The "QAPR Comment on Outage" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "NPR Outages List Linked Table" worksheet of spreadsheet RINB-36-01. The "QAPR Comment on Outage" Table in Statistics Backend.accdb is populated by importing data into it from THEOS (the business application used by Network Operations staff to record outage data). Each of these outage records in the Statistics Backend database is populated with a TRUE/FALSE value for the AER Protection Failure field. Selecting the appropriate AER Protection Failure value occasionally requires obtaining additional information from Opslog (a separate business application used as a diary/logbook by Network Operators).	No	Every outage record in the "NPR Outages List Linked Table" worksheet of the RINB-36-01 spreadsheet classified as a Protection Failure (i.e. column AL contains TRUE), is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01.	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid.
TQS0120 Material failure of Supervisory Control and Data Acquisition (SCADA) system	The number of TransGrid SCADA outage events advised by AEMO to TransGrid in any given year.	Email from Terry Day (AEMO) received on 02/01/2019 (RINB-36-04).	No	This value was calculated by counting all occurrences of SCADA outages reported from AEMO to TransGrid, for the relevant calendar year. AEMO is responsible for monitoring and reporting this variable.	Accuracy of data from AEMO.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TQS0121 Incorrect operational isolation of primary or secondary equipment	Number of events in a given year where the primary or secondary equipment is not properly isolated during scheduled or emergency maintenance. Incorrect isolation is defined as any accidental or deliberate action by a staff member or contractor that results in an unplanned outage. No data is available to indicate the occurrence of incorrect isolation action which did not lead to unplanned outages.	<p>The "QAPR Comment on Outage" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "NPR Outages List Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "QAPR Comment on Outage" Table in Statistics Backend.accdb is populated by importing data into it from THEOS (the business application used by Network Operations staff to record outage data). Each of these outage records in the Statistics Backend database is populated with a TRUE/FALSE value for the AER Incorrect Isolation field. Selecting the appropriate AER Incorrect Isolation value occasionally requires obtaining additional information from Opslog (a separate business application used as a diary/logbook by Network Operators).</p>	No	Every outage record in the "NPR Outages List Linked Table" worksheet of the RINB-36-01 spreadsheet classified as an Incorrect Isolation (i.e. column AM contains TRUE), is counted across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01.	Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.6.2 - MARKET IMPACT COMPONENT</b>					
TQS02 Market Impact Parameter	The number of binding constraint dispatch periods with a marginal cost of constraint >\$10/MW due to TransGrid outages that do not meet any exclusion criteria (according to the AER STPIS V5). During the period of time when AER STPIS V5 applies (i.e. 1st July 2018 onward), binding constraint dispatch periods that do not affect the STPIS incentive specifically due to the unplanned outage event limit provision, are not counted within this variable.	<p>The "tblMITC_SettingData" table within the Statistics Backend.accdb database stored on TransGrid's shared drive (with secure access for only staff requiring access). An extract of this table is provided in the worksheet "MIC Linked Table" worksheet of spreadsheet RINB-36-01.</p> <p>The "tblMITC_SettingData" Table in Statistics Backend.accdb is populated by manually entering data into it which is output from the MITC Reporting.xlsm spreadsheet. The MITC Reporting.xlsm spreadsheet is a macro enabled spreadsheet in which the user inputs relevant data from various sources including THEOS (the business application used by Network Operations staff to record outage data), Opslog (a separate business application used as a diary/logbook by Network Operators), ez2view (a software package developed by 3rd party vendor Global Roam, used to retrieve National Electricity Market data from AEMO), and NOS (AEMO's online database for network outage data resulting in market constraints).</p>	No	Every monthly penalty count record in the "MIC Linked Table" worksheet of the RINB-36-01 spreadsheet has its non-excluded penalty count (column C) summed across the relevant calendar year and forms this value. This RIN variable (amongst various others) is presented in the "Economic RIN" worksheet of the spreadsheet RINB-36-01.	Accuracy of National Electricity Market data from AEMO, which is provided via the ez2view software and NOS. Accuracy of the record data sources (THEOS and/or Opslog) maintained by the Network Operations group within TransGrid



Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>3.6.3 - SYSTEM LOSSES</b>					
TQS03 System Losses	$\{(Energy\ into\ TransGrid - Energy\ out\ of\ TransGrid) / Energy\ into\ TransGrid\} * 100$	TransGrid's TUOS billing system	No	This is defined as $\{(Energy\ into\ TransGrid - Energy\ out\ of\ TransGrid) / Energy\ into\ TransGrid\} * 100$ 2018 calendar year data for the energy into TransGrid's network and the energy out of TransGrid's network have been extracted from the spreadsheets developed for the 2017/18 and 2018/19 RINs (January to June 2018 from the 2017/18 RIN and July to December 2018 from the 2018/19 RIN).	Rounded to two significant figures

### 7.3.8 Worksheet 3.7 Operating Environment Factors

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
<b>TEF01 3.7.1 - TERRAIN FACTORS</b>					
TEF0101 Total number of maintenance spans	Where the contractor has claimed and been paid for maintenance work in a span it is counted as a maintenance span.	<p>The data is sourced from the vegetation maintenance contractors who prepare an invoice input spreadsheet as part of their invoices submitted for vegetation maintenance.</p> <p>Logs from work completed by internal staff where vegetation maintenance occurred on the spans were also added to the list of maintenance spans.</p>	No	<p>A count of spans where payment has been claimed by the contractors.</p> <p>The data is calculated from invoices where the vegetation maintenance contractors have claimed against contract rates for work carried out on each span. Refer to TEF0103 for details of the scoping and invoicing process.</p> <p>Where TransGrid staff have trimmed, lopped or sprayed a tree or trees during a line inspection and this information has been recorded it will also be included as a maintenance span.</p> <p>The data was checked to ensure a span was not counted twice if it was noted on multiple invoices of internal works schedule.</p>	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TEF0102 Average Frequency of Cutting Cycle (Years)	The straight average of the vegetation maintenance period for each transmission line for the appropriate year weighted on span count basis.	<p>Transmission Line Maintenance Plan contains the maintenance frequency tables.</p> <p>Equipment Register report provides the number of spans for each line section noted in the Maintenance Plan.</p>	Yes	<p>TransGrid does not currently directly record spans where no vegetation management is required. Scheduled "Hotspot" maintenance details are also not readily available at a span level. Further, an "actual" of this parameter would also need to consider non-routine (defect) works. This makes providing an actuals average frequency down to the span level onerous, hence parameter is an estimate.</p> <p>The vegetation maintenance cycle in years (noted on a line by line basis) was taken from the Maintenance Plan and a weighted average (number of spans based, not length) was calculated.</p>	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TEF0103 Average number of trees per maintenance span (0's)	Total number of trees (>3m in height that could grow to the extent where clearances are encroached) maintained (lopped, removed, slashed, mulched, etc.) divided by the total number of maintenance spans.	<p>Determined during scoping stage of works.</p> <p>The data is sourced from the vegetation maintenance contractors who prepare an invoice input spreadsheet as part of their invoices submitted for vegetation maintenance.</p> <p>Where TransGrid staff have removed trees or lopped during a line inspection and this information has been recorded it has been included in the tree counts.</p>	Yes	<p>The nature of vegetation maintenance makes providing actual tree counts not practical. Dense vegetation maintained by mulching / slashing can remove tens of thousands of trees per span.</p> <p>Easements works are scoped between the TransGrid Easement Officer and the contractor. When scoping vegetation maintenance work an attempt is made to gauge the number of trees being removed, pruned and/or mulched or sprayed by selecting an indicative square metre area that best represents the average vegetation cover within the span and then simply counting the number of trees within the selected area. This number of trees is then multiplied by the total number of square metres being maintained to obtain the total number of trees to be maintained in the span. Often, with a small number of trees being removed or pruned, the individual trees will be counted. This is recorded on a span by span basis and issued to the contractor as a work plan.</p> <p>This method was introduced in FY16. Refer to 2016FY RIN for details on how the validity was tested. The method was not retested for later RIN submissions.</p> <p>Before invoices are submitted the TransGrid Easement Officer will inspect the</p>	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
				<p>work and sign off the work plan as completed to their satisfaction. This will allow the contractor to submit their invoice. This invoice input spreadsheet includes the agreed tree count.</p> <p>The invoices are submitted along with the signed off work plan to Accounts Payable and a central contract coordinator. When the invoice is loaded by Accounts Payable a notification will be sent to the Easement Officer for endorsement. The claim will be checked for consistency with the work plan and endorsed if appropriate. It will then go to the Easement Team Leader for approval.</p>	

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TEF0104 Average number of defects per vegetation maintenance span.	A defect tree is a tree that is identified as being within the clearance requirements of "Maintenance Plan - Easements and Access Tracks" at the time of LiDAR scan.	The results from TransGrid's Routine LiDAR scanning of the network for vegetation infringements.	Yes	<p>Defect trees are identified by LiDAR using a spatial analysis. Multiple LiDAR shots are likely to be reported as within clearance requirements of "Maintenance Plan - Easements and Access Tracks", as the point density of the LiDAR is greater than the size of each tree. Analysis is made to calculate the quantity of defect trees, which may not match actuals onsite, hence the "estimated" description of this variable.</p> <p>Defect vegetation points were counted as one tree if they were within a 1m radius of each other. Total defect trees per maintenance span were then totalled.</p> <p>A defect tree is counted if the identified tree was in a span where maintenance was carried out in the applicable year.</p>	<p>Defect vegetation is in contravention to the requirements of "Maintenance Plan - Easements and Access Tracks" where maintenance work is expected to take into account regrowth prior to the next maintenance cycle such that vegetation never encroaches on safe clearances to conductors</p> <p>The routine used to group these into tree counts assumes a suitable radius of each point.</p>
TEF0105 Tropical Proportion Number of spans	Vegetation Maintenance Spans within the Bureau of Meteorology "Warm Humid Summer" zone	Climate Zone Map	No	Climate zone digital map utilised to run query in GIS (TSS) based on spans within class "Warm Humid Summer", and compare this list against maintenance spans only.	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TEF0106 Standard vehicle access	An area with no Standard Vehicle Access would not be accessible by a two wheel drive vehicle  Value provided is length of network which is accessible by 2WD vehicle.	Ellipse report on electronically recorded mains inspections carried out from 2009 to 2014. TAMIS report on electronically recorded mains inspections carried out from 2001 to 2010.  Route line length figure provided in other areas of the RIN.  Details of all access tracks are currently being loaded into TSS. Condition rating will be added progressively.	Yes	A proportion of the network with accessible spans was calculated for previous RINs at 80.9% using prior inspection results, where access was regarded as OK or YES. Up to date actuals are not available. Details of all access tracks are currently being loaded into TSS. Condition rating will be added progressively.  It is considered appropriate to continue to use this proportion, as it is not generally going to change year to year. The proportion was multiplied with the published line route length for 2018 and rounded to the nearest 100km.  Route line length = 11,328.8 km Std vehicle access = 11,328.8 * 80.9% = 9,165km ≈ 9,200 km	The proportion of accessible structures is not generally going to change year to year. The same proportion is allocated each year to the actual route length of the system and rounded to the nearest 100km.  What is considered accessible by 2WD on any given day could easily change if it rained overnight. A gentle slope when wet on a grassed paddock will stop most 2WD vehicles.
TEF0107 – Altitude Length of line (km) above elevation 600 metres	Length of line with structures above 600m.	TransGrid Spatial System (TSS) 25m grid spot height data.	No	The structure location referenced against spot heights within 30m to determine if elevation above 600m. If the structure was above then attached spans included for length calc	N/A
TEF0108 - Bushfire Risk  Number of spans	Maintenance spans within RFS classification of Category 1, 2 or buffer	TransGrid Spatial System (TSS) NSW RFS Bush Fire Prone Lands (BFPL)	No	Digital map of BFPL used to run query against spans in either Category 1, 2 or buffer lands, and allocate this list against maintenance spans only.	RFS web site documents all category 1, 2 and buffer lands as bush fire prone lands.

## TEF02 3.7.2 - NETWORK CHARACTERISTICS

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TEF0201 - Route Line Length	<p>The length of line routes.</p> <p>Where a line is a double circuit line or split phase, that section of the route is only counted once.</p>	PowerBI Report.	No	<p>The PowerBI report obtains the spans lengths from TSS. Route length was averaged from the two spans attached to dual circuit structures and added to single circuit spans</p> <p>Non-prescribed spans have been excluded.</p>	Route line length includes overhead lines and underground cables.
TEF0202 Variability of dispatch	<p>AER definition refers to non-thermal generators. Thermal generators have been taken to be generators using steam turbines. Using this definition, non-thermal generators are wind turbines, hydro generators and open cycle gas turbines.</p>	TransGrid's TUOS billing system	<p>Yes</p> <p>The figure is based on NEM metering which is used as part of TransGrid's normal course of business. It is also materially dependent on whether the energy from non-thermal generators should be expressed as a proportion of total energy into TransGrid's network (from all "sources") or total energy into TransGrid's network from generators (that is, ignoring sources, such as interconnectors, where it is not possible to identify whether the energy was produced by thermal or non-thermal generators).</p>	<p>Uses data calculated for Energy In as part of calculations for TQS03. This is total Energy Input into TransGrid network.</p> <p>Percentage is taken of 'non-thermal' generation to total Energy Input.</p>	<p>The definition refers to non-thermal generators. Thermal generators have been taken to be generators using steam turbines. Using that definition, the non-thermal generators are wind turbines, hydro generators and open cycle gas turbines.</p> <p>Energy supplied to TransGrid's network from embedded generators has been included in the calculations.</p>
TEF0203 Concentrated load distance	AER definition refers to individual nodes with 30% capacity of generation/load.	Data from that used to calculate TEF0201	<p>Yes</p> <p>As nodes within each group are separate, using groups</p>	The definition of this parameter mentions nodes which have at least 30% of generation capacity or load connected to	Groups of nodes in close geographical location are considered to be 30% of



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Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	<p>For a transmission network the size of TransGrid's, it would not be prudent to configure the network such that there is 30% or more of generation/load at risk for a major event at a single location.</p> <p>To satisfy criteria of 30% or more generation/load, groups of nodes are considered, allowing a concentrated load distance to be derived.</p>		<p>of nodes does not automatically give a single figure for the concentrated load distance.</p>	<p>them. For a transmission network transporting the magnitude of load that TransGrid's network does, it would not be prudent to configure it in a way which places 30% or more of generation or load at risk for a major event at a single location. Consequently, no individual nodes within TransGrid's network meet the criteria.</p> <p>However, if groups of nodes in relatively close geographical proximity are considered, rather than single nodes, it is possible to derive a concentrated load distance. In this case the most widely separated groups of nodes are those in the southern part of the state (including generation connected at Gullen Range, Capital, Uranquinty Murray, Upper Tumut and Lower Tumut) and in the Sydney basin (loads connected at Beaconsfield West, Haymarket, Holroyd, Ingleburn, Liverpool, Macarthur, Regentville, Rookwood Road, Sydney East, Sydney North, Sydney South, Sydney West and Vineyard).</p>	<p>generation or load.</p> <p>The most widely separated groups are those in the Snowy Mountains area and in the Sydney basin. The average of the route line lengths between the closest nodes in the two areas and the two nodes furthest apart.</p>
TEF0204 - Total number of spans	The total number of spans on the network	PowerBI Report.	No	<p>A total count of all spans used to calculate route line length</p> <p>Non-prescribed spans have been excluded.</p>	N/A