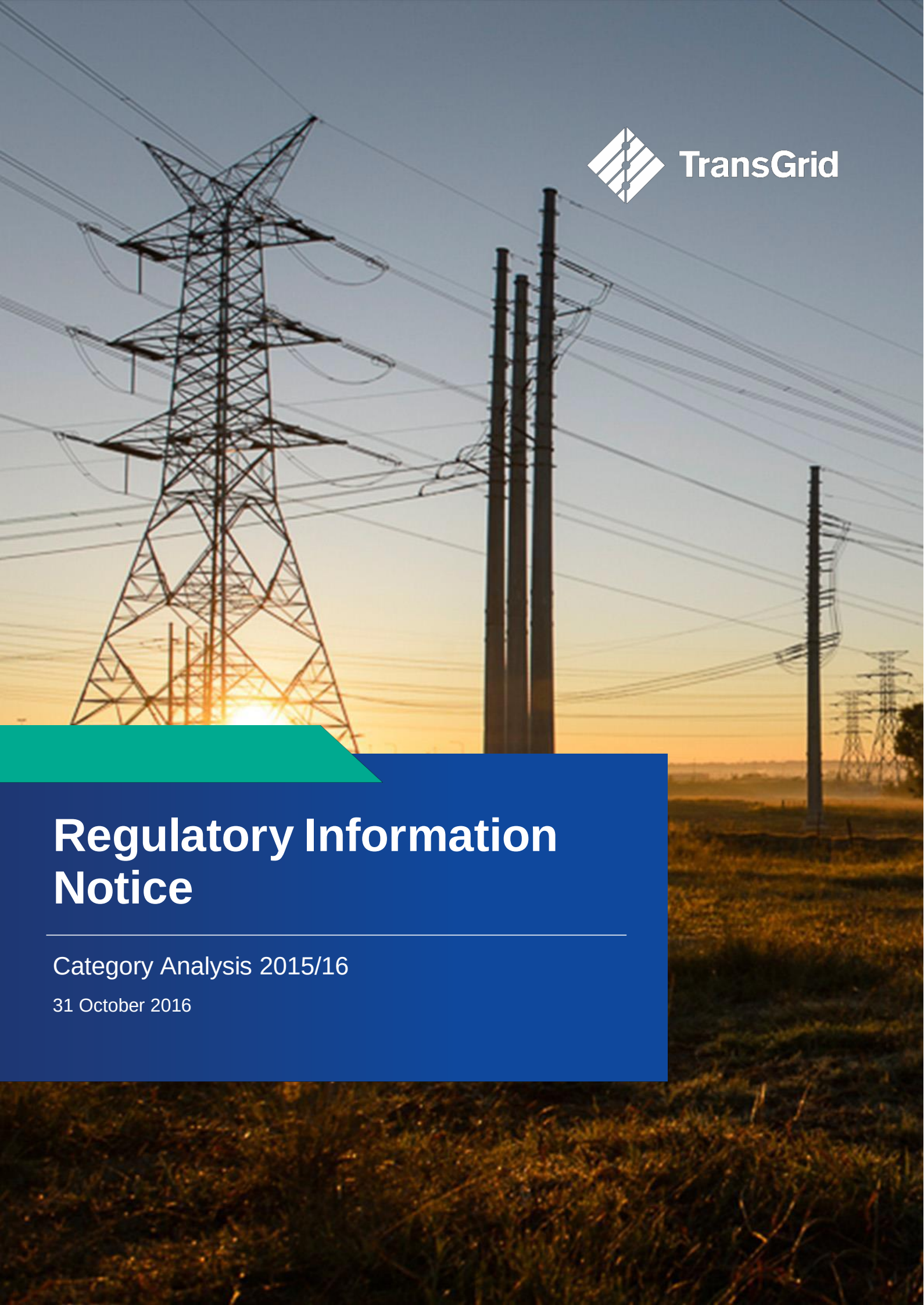


TransGrid

Regulatory Information Notice

Category Analysis 2015/16

31 October 2016

Contents

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 reviewed information package that is due to be submitted to the AER by 31 October 2016. The audited information 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;
3. Confidentiality Claims on any information included in the RIN worksheets;
4. Review Report by the auditor
5. Verification of the information by way of a Statutory Declaration in the form provided as Appendix B to the RIN.

2. Compliance with the RIN Requirements

The 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.

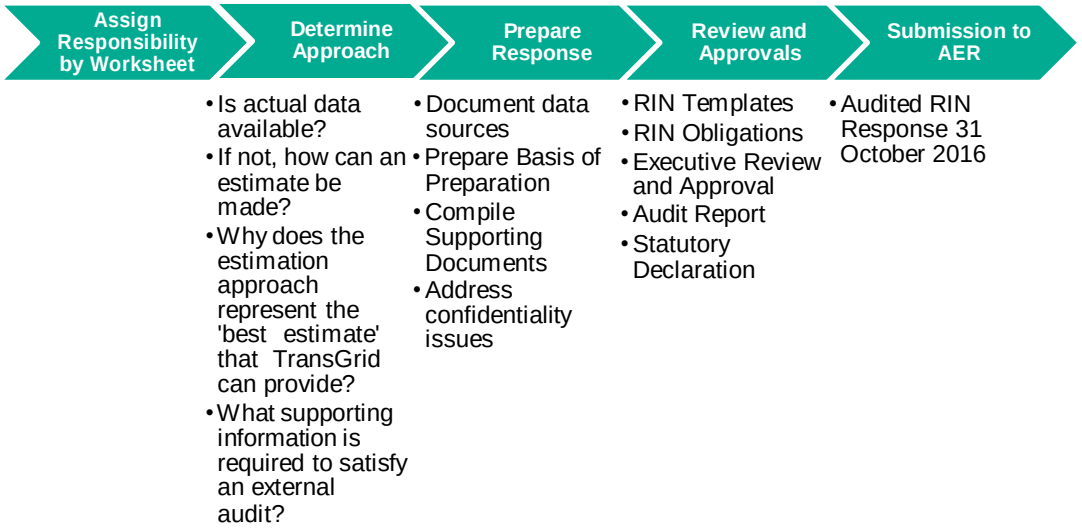
To promote a common approach across the business to addressing the requirements of the Category Analysis RIN, TransGrid has gathered information from across the business using a template prepared to respond to each of the AER's requirements. This is outlined in the table below.

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 [1]?	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* ***Responds to RIN requirement a)***	*Specify source systems, reports, forms, other RIN variables etc* ***Responds to RIN Requirement b)***	*Yes/No* *If estimate is used for this variable, document:* • *Why an estimate was required, including why it was not possible to use Actual Financial Information or Actual Non-Financial Information* • *Estimate basis, including the approach used, assumptions made and reasons why the estimate is TransGrid's best estimate* ***Responds to RIN Requirement d)***	*Clear description of approach steps / methodology* ***Responds to RIN Requirement c)***	*Clearly describe any assumptions used and the rationale for each* ***Responds to RIN Requirement c)***

3. Preparation Process

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

[1] '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".**



3.1 Document Control

The RIN Templates, Basis of Preparation, RIN Responses and supporting documents 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 validity of the data collected. This internally verified information is presented to the auditors, PwC, who then verify the information with data collectors and other relevant persons within TransGrid. The finalised BOP and template is presented to the data managers, who provide sign-offs to individual sections of the RINs and the associated BOPs. A management representation letter is provided to the auditor (PwC) on accuracy of data, and validity of estimates as the best available by TransGrid.

The final RIN package will be provided by 31 October 2016, inclusive of the final Review Report and signed Statutory Declaration.

3.3 Review opinion provided

On 16 December 2015, the NSW Electricity Networks Consortium acquired TransGrid assets from the NSW State Government. As a result of the change in ownership, audited financial accounts was produced for the TransGrid NSW State Owned Corporation (SOC) for the period 1 July 2015 to 16 December 2015, and a separate set of audited financial accounts undertaken for NSW Electricity Networks for the remainder of the financial year to 30 June 2016.

The financial information used for the compilation of the relevant RIN schedules for the full financial year ended 30 June 2016 have therefore been based on the aggregation of the:

- Audited financial information for the TransGrid SOC for the period 1 July 2015 to 16 December 2015, and
- Audited NSW Electricity Networks (NSWEN) Special Purpose Aggregated Financial Report and supporting information for the remainder of the financial period to 30 June 2016.

Management of NSW Electricity Networks Operations Trust (i.e., the current entity responsible for the preparation and submission of the TransGrid RINs) have relied on the audited financial information for the TransGrid SOC in the preparation of the relevant schedules. Accordingly, the aggregation of the financial information for TransGrid SOC and NSWEN is considered to be an estimate for the year ended 30 June 2016.

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. This is subject to the mitigating circumstances discussed in section 3.3 above relating to change of ownership of 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 0.

Information Source	Brief Description	Supports
AEMO Connection Point Forecast 2016	AEMO connection point forecasts are used in applying weather correction (both 10% POE and 50% POE) for non-coincident maximum demand	5.3 maximum demand (MD) - Network Level
AEMO NEFR 2016	National Electricity Forecasting Report (2016) by Australian Energy Market Operator (AEMO), used for applying weather correction (both 10% POE and 50% POE) for system maximum demand	5.3 MD - Spatial
Aerial Laser Survey (ALS)	Refer to LiDAR	2.7 Vegetation Management

Distribution Network Service Provider (DNSP) Forecasts	Forecasts provided to TransGrid from Distribution Network Service Providers (e.g. Ausgrid, Essential Energy, Endeavour Energy)	5.4 MD & Utilisation - Spatial
Economic Benchmarking RIN Data Templates	The Data Templates submitted to the AER in response to the Economic Benchmarking RIN	2.8 Maintenance, 5.2 Asset Age Profile
Ellipse	TransGrid's ERM system, including asset, business and financial reporting	2.2 Repex, 2.3 Augex, 2.5 Connections, 2.7 Vegetation Management, 2.8 Maintenance, 2.10 Overheads, 2.11 Labour , 2.12 Input Tables, 5.2 Asset Age Profile
Finance Data Cube (Ellipse)	Refers to the process of querying TransGrid's financial information from the Ellipse ERM system	
Fleet Database	Fleet is a TransGrid approved application to manage TransGrid's fleet of mobile plant and motor vehicles. The system reports on purchase details, running costs, vehicle usage & FBT attributed to individual motor vehicles and mobile plant. It has direct interfaces to Ellipse to ensure data content is consistent	2.6 Non-network
Invoices Received	Contractor invoices received for vegetation management works have been used to estimate the variables requested in Template 2.6	2.7 Vegetation Management
IT Configuration Management System	Service Desk Plus integrated asset management solution which provides an accurate inventory of all hardware, software assets in TransGrid. BMC Remedy IT Service Management (Asset Management Console) was been introduced in late 2013 to replace Service Desk Plus.	2.6 Non-network
LiDAR	Light Detection and Ranging data sourced from aerial surveys that is used to measure vegetation clearances from TransGrid's transmission line assets.	2.7 Vegetation Management
Operating Manuals	Record the ratings of each circuit on the TransGrid network	2.2 Repex, 2.3 Augex, 2.5 Connections, 5.4 MD & Utilisation - Spatial
Opex Model	TransGrid's opex forecasting model that is used for the preparation of the regulatory proposal	2.8 Maintenance
Project planning & project management documents	Various individual documents used for planning, approval and delivery purposes. This record more detailed project specific information that is not recorded in TransGrid's other systems at a project level.	2.3 Augex, 2.5 Connections, 2.8 Maintenance, 5.2 Asset Age Profile
QAPR	Quarterly Asset Performance Report, an internal report on outages that is generated each quarter from the THEOS System	2.2 Repex, 2.8 Maintenance
System Operating Diagrams	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	2.2 Repex, 5.2 Asset Age Profile
TAMIS	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.	2.2 Repex, 2.7 Vegetation Management, 2.8 Maintenance, 5.2 Asset Age Profile
THEOS	TransGrid's outage recording/reporting system	2.2 Repex, 2.7 Vegetation Management
TransGrid Regulatory Accounts	TransGrid's annual regulatory accounts which are prepared and submitted in accordance with the AER's requirements	2.1 Expenditure Summary, 2.2 Repex, 2.3 Augex Project Data, 2.5 Connections, 2.6 Non-network, 2.7 Vegetation Management, 2.8

		Maintenance, 2.10 Overheads, 2.11 Labour, 2.12 Input Tables
TransGrid Electrical Data Book	A central record of electrical asset data regarding TransGrid's network that is published on the TransGrid Intranet (The Wire).	2.7 Vegetation Management, 2.8 Maintenance, 5.2 Asset Age Profile, 5.4 MD & Utilisation – Spatial
TransGrid 30 Year Asset Management Plan	A long term asset management plan prepared for the TransGrid network.	5.2 Asset Age Profile
TUOS System	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.	5.3 MD - Network Level, 5.4 MD & Utilisation - Spatial
TransGrid Manuals & Policies	Used for the operation and maintenance of TransGrids assets, these outline equipment information, standard practices and maintenance requirements.	2.7 Vegetation Management, 2.8 Maintenance
Workforce Profile Report	Annual submission of the workforce profile to the NSW government	2.11 Labour

6. Confidentiality Claims

TransGrid has directly connected customers, whose data is confidential. Further, demand data of NSW customers is subject to privacy requirements under Clause 7.2 of the *Transmission Operators License under the Electricity Supply Act (1995) NSW* granted to NSWEN on 16 December 2015.
TransGrid has identified the following issues where measures need to be taken to protect confidential information. This is summarised below:

Document affected	Issue	TransGrid Resolution
Worksheet 2.2 Repex	• Ability to determine TransGrid's unit rates for procurement of equipment	Information is available to consumers at an aggregate level
Worksheet 2.5 Connections	• Ability to determine TransGrid's unit rates for procurement of equipment. • Ability to determine TransGrid's supplier costs, labour costs and property costs for particular projects	Information is available to consumers at an aggregate level
Worksheet 5.4 MD and utilisation-spatial	• Certain TransGrid BSPs are predominantly (or exclusively) connected to direct customers. As NSW EN's Transmission Operator's License included mandatory provisions in relation to keeping customer data confidential, TransGrid will exclude the load data of these customers from the public version of the Category Analysis RIN template.	TransGrid will exclude the load data of the relevant BSPs from the public version of the Category Analysis RIN template. TransGrid will present the aggregated load of directly connected customers in the public version of Economic Benchmarking RIN section 3.4.1 (under TOPED0103).

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

The Contents Worksheet does not require any input by TransGrid.

7.2 Worksheet 1.0 Business & Other Details

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

7.3 Worksheets 2.1 to 2.12, 5.2 to 5.4

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 2.1 Expenditure Summary

Financial variables presented in schedule 2.1 are on an as incurred basis consistent with RIN submissions for the previous financial years. Reconciliations between as incurred and as commissioned capital expenditure have been undertaken and available on request.

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
Prescribed transmission services capex (as incurred) Replacement Expenditure	The total expenditure for regulated replacement capital projects, exclusive of capitalised overheads and reported on an 'as incurred' basis. Grouping is based on Portfolio groupings in Ellipse. For repex, we have included: • Major Proj-Presc Security Comp • Major Proj-Presc Replacement • Asset renewal strategies	TransGrid financial records reported from Ellipse and Business Reporting and 2015-16 Regulatory Accounts. Supporting information reported here in RIN 2.1 is in line with that in RIN 2.12 Input Tables.	No	N/A	N/A
Prescribed transmission services capex (as incurred) Connections	The total expenditure for regulated connection capital projects, exclusive of capitalised overheads and reported on an 'as incurred' basis. Grouping is based on Portfolio groupings in Ellipse. For connections, we have included: • Major Proj-Pres	TransGrid financial records reported from Ellipse and Business Reporting and 2015-16 Regulatory Accounts. Supporting information and list of projects are in line with RIN 2.5 Connections and RIN 2.12 input tables.	No	N/A	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
	Connections				
Prescribed transmission services capex (as incurred) Augmentation Expenditure	The total expenditure for regulated augmentation capital projects, exclusive of capitalised overheads and reported on an 'as incurred' basis. Grouping is based on Portfolio groupings in Ellipse. For Augmentation, we have included: • Major Proj-Presc Aug-Main Grid • Major Proj-Pres Aug-Sub Sys • Major Proj-Pres Strat Property • Contingent Budget	TransGrid financial records reported from Ellipse and Business Reporting and 2015-16 Regulatory Accounts. Supporting information reported here in RIN 2.1 is in line with that in RIN 2.3 Augex – Table 2.3.3, as well as RIN 2.12 Input Tables.	No	N/A	N/A
Prescribed transmission services capex (as incurred) Non-Network	The total expenditure for regulated non network capital projects, exclusive of capitalised overheads and reported on an 'as incurred' basis. Grouping is based on Portfolio groupings in Ellipse. For non-network, we have included: • Presc – Other (idemand)	TransGrid financial records reported from Ellipse and Business Reporting and 2015-16 Regulatory Accounts. Supporting information reported here in RIN 2.1 is in line with that in RIN 2.6 Non Network, as well as RIN 2.12 Input Tables.	No	N/A	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
	• Support –Facilities • Support – IT • Support - Motor Vehicles • Support - Plant & Equipment				
Prescribed transmission services capex (as incurred) Capitalised Network Overheads	The network support costs allocated to capital projects.	TransGrid financial records reported from Ellipse and Business Reporting. Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.	Yes	Support costs allocated to capital projects are separately shown in the Finance cube. These support costs are then categorised into Network or Corporate Overheads based on the RC that incurred the costs.	N/A
Prescribed transmission services capex (as incurred) Capitalised Corporate Overheads	The corporate support costs allocated to capital projects.	TransGrid financial records reported from Ellipse and Business Reporting. Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.	Yes	Support costs allocated to capital projects are separately shown in the Finance cube. These support costs are then categorised into Network or Corporate Overheads based on the RC that incurred the costs.	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
Prescribed transmission services capex (as incurred) Balancing Item	The value required to reconcile to TransGrid's Regulatory Accounts.	Balancing item relate to prescribed NCIPAP projects which do not fall under the categories noted above. Amount and treatment of NCIPAP projects is consistent with NCIPAP projects reported in historical capex schedule in the Regulatory Account.	N/A	N/A	N/A
Prescribed transmission services opex by category Vegetation Management	The Vegetation Management Expenditure reported in RIN 2.7.	TransGrid financial records reported from Ellipse and Business Reporting. RIN 2.1 Expenditure Summary figures reconcile to; • Land & Easement opex amount in the Economic Benchmarking RIN Schedule 3.2, adjusted for Access Track Maintenance expenditure reported in schedule 2.8. The categories within EB RIN schedule 3.2 reconcile to the categories for Regulatory Accounts DISAGG Inc and DISAGG Opex. Information reported here in RIN 2.1 is in line with that in RIN 2.7 Vegetation.	No	N/A	N/A
Prescribed transmission services opex by category Maintenance	The Maintenance Expenditure reported in RIN 2.8.	TransGrid financial records reported from Ellipse and Business Reporting. RIN 2.1 Expenditure Summary figures reconcile to; • Total maintenance opex less land & easement in the Economic Benchmarking RIN Schedule 3.2,	No	N/A	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
		adjusted for Access Track Maintenance expenditure. The categories within EB RIN schedule 3.2 reconcile to the categories for Regulatory Accounts DISAGG Inc and DISAGG Opex. Information reported here in RIN 2.1 is in line with that in RIN 2.8 Maintenance.			
Prescribed transmission services opex by category Non-Network	The Non-Network operating expenditure reported in RIN 2.6.	TransGrid financial records reported from Ellipse and Business Reporting and 2015-16 Regulatory Accounts. Consistent with prior period, TransGrid includes the non-network opex in network / corporate overheads, hence the amount here is zero.	No	N/A	N/A
Prescribed transmission services opex by category Network Overheads	The opex component of the total network overheads reported in RIN 2.10.	TransGrid financial records reported from Ellipse and Business Reporting. RIN 2.1 Expenditure Summary figures for this variable reconcile to EB RIN schedule 3.2 for • Total maintenance support & asset management • Total operations • Total Grid Planning Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.	No	N/A	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
Prescribed transmission services opex by category Corporate Overheads	The opex component of the total corporate Overheads reported in RIN 2.10.	TransGrid financial records reported from Ellipse and Business Reporting. RIN 2.1 Expenditure Summary figures for this variable reconcile to EB RIN schedule 3.2 for • Taxes & insurance • Property management • Corporate & Regulatory management • Business management • Self-insurance Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.	No	N/A	N/A
Prescribed transmission services opex by category Balancing Item	The value required to reconcile to TransGrid's Regulatory Accounts.	N/A – Nil Balancing item.	N/A	N/A	N/A

Approved by: Boon Thiow, Group Financial Controller

7.3.2 Worksheet 2.2 Repex

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
Replacement Expenditure	Expenditure associated with projects deemed as being Asset Replacement. This covers capital projects with the following portfolio groupings: • Major Proj-Presc Security Comp • Major Proj-Presc Replacement • Asset renewal strategies This does not include replacements associated with operating, which is typically on an urgent basis. Expenditure is reported on an as commissioned basis projects ready for service in $Nominal .	For projects identified as ready for service during 2015/16, financial data originates from Ellipse and extracted from the finance cube.	Yes TransGrid does not collect or estimate project costs at the level of detail required, particularly for major projects.	Material projects ending in 2015/16 have been allocated based on a combination of the capitalisation sheets, construction contract schedule items, cost breakdowns for internal labour, standard costing and pro-rated. Costs for asset replacement strategy projects are directly attributable to a number of categories.	• Any expenditure from the contracts that is not directly attributable to an item or grouping of items has been prorated across the attributable items. • Standard estimate splits from our estimating database are used is some instances to obtain the required level of details as the capitalisation sheets do not record the required information. • Additional items have been added to allow for directly comparable scopes for costing for the asset replacement strategy works and the major project replacements.
Asset Replacements	Units of asset replaced associated with Replacement Expenditure projects as defined above. This may include assets that have been replaced for security and compliance purposes.	Manual counts from: • Project drawings • Other project specific documents • Equipment tracing information	Yes TransGrid does not specifically associate assets with projects in the equipment	Manual counts from: • Project drawings • Other project specific documents • Equipment tracing information	Cases not considered: • Where a number of assets is replaced with a different number of assets, the newer number is used, unless any can be specifically associated

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
		Calculated counts from sub-project numbers where the relationship between asset counts and projects is known.	register.	Calculated counts from sub-project numbers where the relationship between asset counts and projects is known.	with augmentation. • Where asset replacement is achieved by another asset type, replacement units are based on the replacement asset type. For example a transmission line is effectively replaced with a number of substation reactive plant projects. • Dead Tank CB construction also incorporates other asset types. Where a Dead Tank CB is used to replace a conventional CB, no allowance has been made for the decommissioning of other assets made redundant by the type of CB installed.
Transmission Tower Asset Failures	The failure of any entire transmission structure, subcategorised by voltage and single/multiple circuit. Failure of an asset is defined as when the asset causes an unplanned outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not	Data has been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The	No The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.

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
	included). Failures due to external causes (e.g. thunderstorms) have been excluded.	'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2015 Electrical Data Book (RINB-2-2-02) has been used to determine the voltage and whether the transmission asset is single or multiple circuit.		value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	
Transmission Tower Support Structure Failures	The failure of any individual component of a transmission structure (e.g. insulators, cross-arms) but not the entire structure, subcategorised by voltage and single/multiple circuit. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data has been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2015 Electrical Data Book (RINB-2-2-02) has been used to determine the voltage and whether the transmission asset is single or multiple circuit.	No The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.
Conductor Failures	The failure of any conductor on a transmission line, subcategorised by voltage and rating. Overhead earth-wires have been classified	Data has been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for	No The values provided are	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by 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
	into the 'Other' category. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2015 Electrical Data Book (RINB-2-2-02) has been used to determine the voltage. The TransGrid Operating Manuals, i.e. documents RINB-2-2-03, RINB-2-2-04, RINB-2-2-05 & RINB-2-2-06, have been used to source the conductor rating.	actual data.	populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	Operations staff in THEOS, as per standard procedure.
Transmission Cable Failures	The failure of any transmission cable, subcategorised by voltage and insulation type. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data has been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category.	No The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.

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 TransGrid December 2015 Electrical Data Book (RINB-2-2-02) contains voltage and insulation information.		the corresponding numerical value is counted and reported across the relevant financial year.	
Substation Switchbay Failures	The failure of any components within a substation switchbay, subcategorised by voltage and the following equipment types: CB, Disconnector, Earth Switch, VT, CT, GIS Module, and Other. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data has been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category.	No The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.
Substation Power Transformer Failures	The failure of power transformers subcategorised by voltage and MVA rating. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included).	Data has been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided	No The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.

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
	Failures due to external causes (e.g. thunderstorms) have been excluded.	in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2015 Electrical Data Book (RINB-2-2-02) has been used to determine the transformer voltages and ratings.		Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	
Substation Reactive Plant Failures	The failure of reactive plant subcategorised by voltage and the following reactive plant types: SVCs, Capacitors, Oil Filled Reactors, and Other. Note that failures of capacitors or reactors within an SVC are classified as SVC failures. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data has been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2015 Electrical Data Book (RINB-2-2-02) has been used to determine the reactive plant voltages.	No The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.
SCADA, Network Control and Protection System	The failure of all SCADA, Network Control and Protection equipment subcategorised by the following	Data has been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on	No The values provided are	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database	It is assumed that every asset failure that has occurred has caused an unplanned outage

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
Failures	types: Protection Assets, Control Assets, Communications Assets and Metering Assets. Note that this category does not include the Material Failures of SCADA as reported in the previous Economic RIN to the AER. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category.	actual data.	contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	that is recorded by Network Operations staff in THEOS, as per standard procedure.
Substations					
Total MVAr By SVC (2.2.2)	Asset volumes: The combined nominal maximum reactive power rating for all SVCs in service at the end of the financial year. This is capacitive for TransGrid SVCs. Asset replacements: The total nominal maximum reactive output of SVCs replaced in the year.	Small number of SVCs manually counted. Ratings from the Electrical Data Book.	No	Manual count. Check: Asset volume = Asset volume in prior year + asset volume installed in current FY- asset volume decommissioned in current FY. Asset replacement column presents the total installed during the FY.	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
Total MVARs by Capacitors (2.2.2)	Asset volumes: The combined nominal reactive power rating for all capacitors in service at the end of the financial year. Asset replacements: The combined nominal reactive power rating for all capacitors replaced in the year.	Capacitors identified using asset count data prepared for schedule 5.2. Rating information is cross checked using Operating Diagrams. Manual review of Operating Diagrams for the small number of projects identified	No	Manual count. Check: Asset volume = Asset volume in prior year + asset volume installed in current FY- asset volume decommissioned in current FY. Asset replacement column presents the total installed during the FY.	N/A
Total MVARs by Oil Filled reactors (2.2.2)	Asset volumes: The combined nominal reactive power rating for all oil filled SHUNT reactors in service at the end of the financial year. Asset replacements: The combined nominal reactive power rating for all oil filled SHUNT reactors replaced in the year.	Reactors identified using asset count data prepared for schedule 5.2. Rating information is cross checked using Operating Diagrams.	No	Manual count. Check: Asset volume = Asset volume in prior year + asset volume installed in current FY- asset volume decommissioned in current FY. Asset replacement column presents the total installed during the FY.	Series reactors are excluded as they do not provide voltage support for the network.
Lines					
Transmission Lines Repex Asset Replacement Expenditure by Asset Category ($0s)	Replacement capital expenditure on Transmission Line Structures due to the line being unable to efficiently maintain its service performance requirement. Replacement capital expenditure on Transmission Line Support Structures due to the line being unable to efficiently maintain its	TransGrid's Enterprise Resource Management system - Ellipse. Project capitalisation sheets & construction contracts.	Yes TransGrid does not collect or estimate project costs at the level of detail required, particularly for	Material projects ending in 2015/16 have been allocated based on a combination of the project capitalisation sheets, construction contract schedule items, cost breakdowns for internal labour, standard costing and pro-rated. Costs for asset replacement strategy projects are directly attributable to a number of categories.	Refer to Table 1 under Notes.

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
	service performance requirement. Replacement capital expenditure on Transmission Line Conductors due to the line being unable to efficiently maintain its service performance requirement.		major projects.		
Transmission Lines Repex Additional Repex Expenditure by Asset Category ($0s)	These are additional categories to the ones provided in Repex Template. Including: • Capital expenditure on Transmission Line Structures to allow them to meet regulatory requirements (ground clearances). • Capital expenditure works dismantling works associated with transmission line rearrangements. • Capital expenditure works to assist with the dismantling and rearrangement of distributor connections due to substation replacement projects.	TransGrid's Enterprise Resource Management system - Ellipse. Project capitalisation sheets & construction contracts.	Yes	Material projects ending in 2015/16 have been allocated based on a combination of the project capitalisation sheets, construction contract schedule items, cost breakdowns for internal labour, standard costing and pro-rated. Costs for asset replacement strategy projects are directly attributable to a number of categories.	Structures that have been modified by the replacement of a single pole of a multiple pole structure have not been classed as replacements and are included in other (e.g. a single pole added to increase the height of a single phase for ground clearances).

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
Transmission Line Repex Asset Replacements (Units)	No. of Transmission Line Structures replaced due to the line being unable to efficiently maintain its service performance requirement or due to line rearrangements for substation replacement projects. No. of Transmission Line Support Structures replaced due to the line being unable to efficiently maintain its service performance requirement or due to line rearrangements for substation replacement projects. No. of Transmission Line conductors replaced due to the line being unable to efficiently maintain its service performance requirement or due to line rearrangements for substation replacement projects.	TransGrid's Enterprise Resource Management system - Ellipse. Detailed design information.	No	The structure counts were obtained from the detailed design information for the completed projects.	Refer to Table 1 under Notes.
Transmission Line Repex Other Repex Expenditure (units)	Due to the variable nature of the included works no count has been determined as appropriate. Refer to table 2.	Project specific documentation including drawings and contracts.	Yes	From construction schedules and prorate for the remaining expenditure.	N/A
Transmission Line Repex	The failure of an asset to perform its function not caused by external events outside beyond its designed	THEOS Outage management and recording system.	No	Every failure of transmission line assets have been investigated and the cause identified. Some investigations lead to	Where a failure investigation identified that a failure occurred due to weather

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
Asset Failures	capacity.	Asset Performance Failure Investigations.		official formal reports, others are reviewed and reported on email.	events beyond the structure's designed capability, this is not recorded as an asset failure.
Transmission Lines Repex Selected Asset Characteristics Conductor Length Material Type Asset Volumes Currently In Commission	The type of conductor installed on TransGrid's transmission network identified by route length (KM).	Electrical Data Book. TransGrid Asset Management Information System (TAMIS).	No	Calculations are based on total length of conductors. From the data records in the transmission line data book the total circuit km of conductor have been added up.	Calculations are based on total circuit length of conductor. Where a circuit has a split phase configuration, it is counted twice. This calculation has only been performed on phase conductors not earthwires. Circuit length of conductor is used (twin conductor not counted twice, three phases not counted three times).
Transmission Lines Repex Selected Asset Characteristics Conductor Length Material Type Asset Replacements	The type of conductor replaced or installed for line rearrangements for substation replacement projects on by route length (KM).	N/A	No	The values were calculated from detailed design drawings.	Line rearrangements for other project requirements is not counted as replacement expenditure, e.g. for line deviations. Earthwire replacement and reuse of conductors have not been included.
Other Replacement	The 'Other Replacement Expenditure' category, as per table 2 below, represents additional	Ellipse	Yes	These represent additional categories of costs that are replacement in nature but cannot be accounted for elsewhere in	

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
Expenditure	replacement capital expenditure projects that cannot be categorised as a discrete number of asset replacements. This includes: - Security and Compliance Projects (these are largely 'replacement' in nature); and - 'Other Replacement Expenditure' (which comprises the residual of the replacement capex and includes the items that have not specifically be allocated to an individual asset type e.g. civils, structures, buildings).			the RIN templates.	

Notes:

Table 1

The following types of projects are identified as REPEX as Asset Replacements:

Category	Project Type	Description
Structure Replacements	Wood Pole Replacement	Complete replacement of wood pole transmission line structures (Not on a defect basis).
Structure and Conductor Replacements	Transmission Line Rebuild	Complete replacement of wood pole transmission line structures and conductors (Not on a defect basis).
Support Structure	Insulator Replacement	Replacement of insulators on existing transmission line (Classified as transmission line support structure).

Replacements		

Table 2

The following types of projects are identified as REPEX for other Repex Expenditure:

Category	Project Type	Description
Asset Life Extension	Tower Life Extension	Life extension of steel tower structures to prevent corrosion (Classified as transmission structure replacement).
	Cable Backfill Remediation	Life extension of cable through remediation of backfill to allow cable to operate closer to its design thermal limits.
	Tunnel Life Extension	Life extension of tunnel to correct installation issues and allow continued operation.
Modification to Meet Regulatory Requirements	Aerial Marker Balls	Addition of marker balls to transmission line earth wires to meet regulatory requirements (Classified as transmission line support structure replacement).
	Low Span Remediation	Work on a transmission line so it can meet regulatory requirements for ground clearance. This can involve a variety of different work methods. The rectification of clearance on one span is taken as a single structure replacement.

Approved by: Lance Wee, Manager/Asset Strategy

7.3.3 Worksheet 2.3 Augex

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
Augmentation Project	Major projects relating to augmentation of the network in order to improve the quality of the network and to meet regulatory obligations.	TransGrid financial records reported from Ellipse and Business Reporting based on portfolio groupings. Portfolio groupings 'Major Pro-Presc Aug-Main Grid', 'Major Pro-Presc Aug – Sub Grid', 'Major Pro-Presc Strategic Property' and 'Contingent Budgeted' are included. AER guidelines require further disclosure of substation or transmission line projects which are ready for service in 2015/16 and the total project expenditure is greater than $5 million. In such case, total project costs will be reported on real $ basis as drawn from Ellipse ($Nominal) and will be inflated to $Dec-15 using the same CPI modifiers consistent with TransGrid's CPI conversion methodology. For projects ready for service in 2015/16 no substation or transmission line projects were above $5 million therefore no further detailed disclosure is required.	No	Projects are extracted from Ellipse Finance cube. Reference is made to the Portfolio Grouping in Ellipse and other relevant sources to determine the project category for reporting in RIN.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.
Substation and Project Summary Information	As per AER interpretation	Project planning documents. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Values captured from project documents.	No assumptions were made as data was extracted straight from project plans.

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
Plant & Equipment Volume	As per AER interpretation	Project planning documents. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Values captured from project documents.	No assumptions were made as data was extracted straight from project plans.
Plant & Equipment Expenditure	Procurement costs of the plant / equipment.	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the transformer, switchgear, reactive plant and other plant & equipment costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.
Installation Labour Volume	The number of hours allocated to labour expenditure	TransGrid financial records reported from Ellipse and Business Reporting. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Detailed project transaction report is run for each project which includes the internal labour hours costed to the project.	Categorisation of labour volume is based on the expense element classification in Ellipse.
Installation Labour Expenditure	TransGrid labour costs directly charged to the work orders of the Augmentation projects	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the labour costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.

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
Expenditure – Civil Works	Costs allocated to civil works including buildings, earthworks, drainage, landscaping, roads and fencing.	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the civil works costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.
Expenditure – Other Direct	Dierct costs charged to the Augmentation projects other than plant & equipment procurement, labour and civil works.	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain other direct costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.
Years Incurred	The period the augmentation project took place.	Project documentation No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Information from relevant project documentation.	N/A
Related Party Contract Margin	As per AER interpretation	N/A	N/A	TransGrid does not have related party contracts in relation to augmentation projects.	N/A
Related Party Contract Total	As per AER interpretation	N/A	N/A	TransGrid does not have related party contracts 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
				relation to augmentation projects.	
Non Related Party Contracts	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain other direct costs.	Categorisation of costs is based on expense element classification in Ellipse and plant and equipment costs reallocated as appropriate.
Land Purchases Expenditure	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain land purchase costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.
Easement Expenditure	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain easement costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.
Line and Project Summary – Project	The type of augmentation work completed on the	Project planning documents / Project Cable schedules.	No	Values captured from project documents and	No assumptions were made as data was extracted straight from project plans and schedules.

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
Type	transmission line.	No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.		cable schedules.	
Line and Project Summary – Route Line Length Added	The additional route length added to the TransGrid's network due to this augmentation project.	Project planning documents / Project Cable schedules. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Values captured from project documents and cable schedules.	No assumptions were made as data was extracted straight from project plans and schedules.
Towers/poles (including structures, and civil works) Configuration	The structure configuration resulting from this augmentation project.	No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Towers/poles (including structures, and civil works) Towers/Poles Added	The number of structures added to TransGrid's network due to this augmentation project.	No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Towers/poles (including structures, and civil works) Towers/Poles Upgraded	The number of structures upgraded in TransGrid's network due to this augmentation project.	No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
MVA Rating – Pre – Lines and Cables	The normal ratings for the underground cable prior to the augmentation being undertaken with the season	No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	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
	used based upon the maximum demand time for that year.				
MVA Rating – Post – Lines and Cables	The normal ratings for the underground cable after the augmentation is undertaken with the season used based upon the maximum demand time for that year.	No further disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Emergency Rating- Pre – Lines and Cables	The contingency ratings for the underground cable prior to the augmentation being undertaken with the season used based upon the maximum demand time for that year.	No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Emergency Rating – Post – Lines and Cables	The contingency ratings for the underground cable after the augmentation is undertaken with the season used based upon the maximum demand time for that year.	No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Circuit KM Added	The additional circuit length added to the TransGrid's network due to this augmentation project.	No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	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
Expenditure – Lines and Cables	Lines and cables expenditure	No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Expenditure – Other Plant	Other plant costs related to Lines and Cables	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Installation Labour Volume	The number of hours allocated to labour expenditure	TransGrid financial records reported from Ellipse and Business Reporting. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Installation Labour Expenditure	TransGrid labour costs directly charged to the work orders of the Augmentation projects	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Expenditure – Civil Works	Other civil costs related to Lines and Cables	TransGrid financial records reported from Ellipse and Business Reporting.	No	N/A	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
		No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.			
Expenditure – Other Direct	Materials are the raw materials, standard parts, specialised parts and sub-assemblies required to assemble or manufacture a network/non-network asset or to provide a network/non-network service.	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Years Incurred	The period the augmentation project took place	Project documentation No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	Information from relevant project documentation.	N/A
Related Party Contract Margin	As per AER interpretation	N/A	N/A	TransGrid does not have related party contracts in relation to augmentation projects.	N/A
Related Party Contract Total	As per AER interpretation	N/A	N/A	TransGrid does not have related party contracts in relation to augmentation projects.	N/A
Non Related Party Contracts	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting.	No	N/A	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
		No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.			
Land Purchases – Lines and Cables	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Easements - Lines and Cables	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse. No disclosure required for FY15-16. Refer explanation in 'Augmentation Project' above.	No	N/A	N/A
Expenditure, Substations, Lines and Other Assets	Total augex expenditure for the year FY15/16 (i.e. as incurred basis).	TransGrid financial records reported from Ellipse and Business Reporting. Total augex expenditure for the year is split into substations, lines and other assets based on the 'asset type' description in Ellipse. Total as incurred augex ($Nominal) for FY15/16 agrees to RIN schedule 2.1 expenditure summary and 2.12 input tables.	No	The total augmentation capex for 2015-16 is obtained from Finance cube, and in line with RIN 2.1.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.

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
Non material projects	Augmentation projects ready for service in FY15/16 where the total project cost is less than $5 million	TransGrid financial records reported from Ellipse and Business Reporting. Projects are extracted from Ellipse sourced through the Finance cube for projects identified as ready for service. Expenditure is total project cost excluding support cost. Total project costs are reported in real $Dec-15 using the same CPI modifiers consistent with TransGrid's CPI conversion methodology.	No	Projects are extracted from Ellipse Finance Cube for projects identified as ready for service. Expenditure is total project costs excluding support cost.	

Notes:

A reconciliation has been undertaken to reconcile the data between schedules 2.3.1 and 2.3.2 (as commissioned expenditure) to schedule 2.3.3 (as incurred expenditure for 2015/16) and is available on request.

Approved by: Boon Thiow, Group Financial Controller (financial data)

7.3.4 Worksheet 2.5 Connections

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
Connection Project	Capital projects relating to new primary or secondary systems assets, in response to requests from customers, including other Network Service Providers. This excludes non-regulated projects. Total project costs are reported for connection projects available for service in FY15/16.	Connection projects are extracted from TransGrid's financial records (using Ellipse Finance cube) based on Portfolio Grouping of "Major Proj-Pres. Connection". Connection projects are reconciled to 2015-16 Regulatory Accounts and RAB.	No	N/A	This is not applicable; project costs are directly extracted from the Finance cube.
Direct Materials Costs	Raw materials, standard parts, specialised parts and sub-assemblies required in the execution of Connection projects.	Direct material costs are extracted using the Finance cube. Information is further drilled down to Cost Category "Materials" to obtain the Direct Materials Costs. Direct material costs are reported on a nominal basis.	No	N/A	Overhead (support cost allocated) is excluded from the amounts reported as per AER requirements. Equipment cost has been excluded for this RIN.
Direct Labour Costs	Labour costs directly charged to the work orders of the Connection projects.	Direct material costs are extracted using the Finance cube. Information is further drilled down to Cost Category for each Connection project. Cost category "Labour" is used to obtain the Direct Labour Costs.	No	N/A	Overhead (support cost allocated) is excluded from the amounts reported as per AER requirements.

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
		Direct labour costs are reported on a nominal basis.			
Connection Rating (MVA)	Normal cyclic rating	Operating manuals, ratings advice, or project initiation documents (such as Project Approval Documents (PAD), Needs Statements).	Yes	Information obtained from rating advices, relevant operating manuals and project documents.	For existing installations, either the rating specified in the PAD or the lowest normal rating (for the seasons or months for which ratings were given in an Operating Manual) was used. For future installations, the rating of other installations at that location which are likely to be similar to that to be provided in the future were used.
Connection Voltage (kV)	Nominal voltage	Operating manuals or project initiation documents (such as Project Approval Documents (PAD), Needs Statements), substation drawings.	No	Information obtained from rating advices, relevant operating manuals, project documents and substation drawings.	N/A
Underground / Overhead	Whether the Connection point (entry or exit) is underground or overhead	Project documentation including Project Approval Documents (PADs), Need Statements, substation drawings.	No	Information obtained from project documents and substation drawings.	The physical point at which the asset ceases to be a TransGrid asset and becomes a customer (e.g. Essential Energy) asset.
Year Connection Project Completed	Financial year end date that the project is complete and the asset is in service.	TransGrid financial records reported from Ellipse and Business Reporting. Project documentation.	No	"Actual Finish Date" is obtained from the Finance Cube Report, in conjunction with the Project Close Out Report, Project Management Report and Ellipse Project Information, which is signed off by Manager/Portfolio	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
				Management.	

Approved by: Boon Thiow, Group Financial Controller (all except connection rating, connection voltage, underground/overhead)
Approved by: Nalin Pahalawaththa, Manager / Power System Analysis (Connection rating, connection voltage, underground/overhead)

7.3.5 Worksheet 2.6 Non-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
Service Subcategory - IT & Communications - Capex	Capital expenditure on Non-Network IT by 'Client Device', 'Recurrent' and 'Non-Recurrent' sub-categories. Prepared on an as commissioned basis, in nominal $.	TransGrid financial records reported from Ellipse and Business Reporting. Information was extracted from Ellipse Finance Data Cube based on portfolio grouping "Support – IT".	No	Information was extracted from the Finance Data Cube. Figures are actual balances and exclude capitalised support cost (element 400). Each project was classified to the recurrent, non-recurrent or client device categories.	Each project is allocated to an ICT category based on the nature of the project. The ICT categories map to a RIN category as per the table below: Application projects and ICT Management were classified as non-recurrent expenditure as these projects establish new IT services. End user infrastructure is Client Device Expenditure. Remainder are Recurrent Expenditure as these are cyclical replacement projects (i.e.

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
					upgrades/replacements of the existing IT Infrastructure).
Service Subcategory IT & Communications - Opex	Operational expenditure on Non-Network IT by 'Client Device', 'Recurrent' and 'Non-Recurrent' sub-categories.	TransGrid financial records reported from Ellipse and Business Reporting. Information was extracted from Ellipse Finance Data Cube and agreed to Regulatory accounts / opex model.	No	Information was extracted from the Finance Data Cube. Please also refer to the notes for operating expenditure in RIN 2.1 - Expenditure Summary. Figures are actual balances. Each RC-AC-Expense Element was classified to the recurrent, non-recurrent or client device categories and totalled. The calculation includes Opex for all work orders/accounts for the IT& Communications subcategory for TransGrid as a whole (both the IT group and other Business Units). Depreciation costs have been excluded.	Categories: Non-recurrent - Expenditure on privatisation, business separation and safety day. Client device - Expenditure on computer equipment (account 287). Recurrent - Remainder.
Annual Descriptor Metrics – IT & Communications Expenditure (Employee Numbers)	Total Number of TransGrid Employees	Based on staff actuals as at 30 June 2016 / Workforce profile data. Historical data was extracted from workforce profile data and employee headcount data.	No	Historical data was extracted from workforce profile data and employee headcount data. Data supplied by HR.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting. Historical data is actuals as at 30 June 2016. As requested by the AER, only employees engaged in prescribed Transmission services work are to be reported. As such, employees from Business Growth & Revenue (BG&R) (except those in Prescribed Revenue and

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
		Data supplied by HR.			Pricing) and the Telecommunications business units were excluded. These employees cater for non-prescribed services.
Annual Descriptor Metrics – IT & Communications Expenditure (User Numbers)	Total Number of Users (Employees + Contractors)	IT Configuration Management System	No	User count is based on historical data from the IT Configuration Management System as at 30/6/2016.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting. Unique users of workstations across TG (employees and contractors). Users with more than one device are counted only once. Exclusions: 1. Users from BG&R (except those in Prescribed Revenue and Pricing) and the Telecommunications business units. These employees cater for non-prescribed services. 2. Users without a TransGrid issued device (e.g. remote contractors) are not included. User count is based on historical actuals.
Annual Descriptor Metrics – IT & Communications Expenditure (Number of Devices)	Total Number of Devices	IT Configuration Management System	No	Based on historical data from the IT Configuration Management System as at 30/6/2016.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting. Workstations: 1. Selection criteria "Product type = workstation OR Tablet" 2. Remove units with "Remedy Status = disposed, End of Life, Lost, Reserved (Tool PC's) and Stolen" 3. Remove units allocated to BG&R & Telecommunications 4. Remove units with Product Tier 3 = Vmware Image

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
					(Virtual Desktops) Smartphones: 1. Selection criteria "Product type = Smartphone" 2. Remove units with "Remedy Status = disposed" 3. Remove units allocated to BG&R & Telecommunications Total Workstations, Tablets and Smartphones. Exclusions: Devices allocated to employees in Customer Engagement & Non-prescribed Revenue Proposals from the Business Unit Business Growth & Revenue (BGR) and the Telecommunications business unit. These employees are deemed non-prescribed.
Asset Category (Motor Vehicles)	Standalone Elevated Work Platforms are defined as an Elevated Work Platform (LCV), whereas elevated work platforms mounted to a truck are defined as an Elevated Work Platform (HCV) Mobile plant items such as trailers, excavators, mowers, tractors, forklifts etc. are defined as "Other" and are shown separately.	TransGrid Fleet Database	No	Data was obtained from the TransGrid Fleet database for active vehicles as at 30/06/16.	Includes replaced vehicles that were active or on short term loan.100% private use contract officer vehicles have been excluded. Mobile plant items such as trailers, excavators, mowers, tractors, forklifts etc. plus lifting appliances (cranes and hoists) and other vehicle mounted plant items are defined as "Other" and are have been excluded from all metrics. Capital and Operating costs for "Other" items have been provided as a separate line item. 100% private use vehicles are excluded from all data.
Asset Reporting Category (Motor Vehicles - Capex)	Motor Vehicle Capex by vehicle type	TransGrid's Regulatory Accounts TransGrid Fleet Database	No	Capital expenditure for FY15/16 was obtained from the Regulatory Accounts for 'Mobile Plant' (5739) and 'Motor	For project numbers starting with 5739, assets identified as an Elevated Work Platform (LCV and HCV) or Heavy Commercial Vehicle are separated with all other assets deemed to be a Miscellaneous Plant and defined as "Other".

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
				Vehicles' (5777) categories. 'Motor Vehicles' include the Asset Categories Car and Light Commercial Vehicle, and 'Mobile Plant' includes Asset Categories Elevated Work Platform (LCV and HCV) and Heavy Commercial Vehicle.	For project numbers starting with 5777, only transactions with a valid purchase order number are deemed to be an actual capital purchase, with other transactions excluded as they are deemed to be journals or accruals. Assets with a Vehicle Class of "Light Commercial" or a Vehicle Model of "Ranger", "Amarok" or "Landcruiser" are deemed to be a Light Commercial Vehicle with all other assets treated as a Car. 100% private use vehicles are excluded. A reconciliation of FY16 capital expenditure between the project ledger and the transaction categorisation identified a variance $221k. The variance has been allocated to miscellaneous plant ($7k) and light commercial vehicles ($214k).
Asset Reporting Category (Motor Vehicles - Opex)	Motor Vehicle Opex by vehicle type	TransGrid's Regulatory Accounts TransGrid Fleet Database	Yes	OPEX costs are based on actual costs incurred in FY15/16. Data was obtained from activity centres 585 and 756 with expense codes 266 (Fuel), 269 (Tyres), 270 (Spare Parts) and 439 (Maintenance). Transaction data was extracted from the fleet database to enable the actual costs from TransGrid Accounts to be proportioned by Asset Category.	Depreciation and insurance costs are excluded from the operating costs on the basis that these operating costs are accounted for elsewhere in the RIN templates. 100% private use vehicles are 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
Average Kilometres Travelled	Average Kilometres travelled by vehicle type	TransGrid Fleet Database	No	Average kilometres for vehicle types from TransGrid Fleet Database during FY15/16.	Annual kilometres are based on vehicles fitted with an odometer. 100% private use vehicles are excluded.
Number Purchased	Total number of vehicles purchased	TransGrid Fleet Database	No	Number of vehicle purchases by vehicle type recorded in TransGrid Fleet Database.	100% private use vehicles are excluded.
Number in Fleet	Total number of vehicles in the fleet by vehicle type	TransGrid Fleet Database	No	Total vehicles by vehicle type recorded in TransGrid Fleet Database and active as at the 30th June 2016.	100% private use vehicles are excluded. Vehicles that have been removed from the TransGrid Fleet and sent for sale have been included in the numbers as they are still active in the Fleet database.
Proportion of total fleet allocated to regulatory expenditure (%)	Proportion of the fleet (by vehicle type) that are allocated to regulatory expenditure	TransGrid Fleet Database	No	100% cost allocation has been assumes on the basis that 100% Private Use vehicles have been excluded (Non Regulated Assets).	100% private use vehicles are excluded.
Service Subcategory -Buildings & Property - Capex	Building and Property capital expenditure classified as non-network in TransGrid's regulatory accounting statements. This is reported under portfolio grouping "Support-Facilities & Buildings". Due to the nature of the asset class, as incurred is considered the same as as	TransGrid financial records reported from Ellipse and Business Reporting. Information was extracted from the Finance Data Cube	No	N/A	No assumptions were made.

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
	commissioned.				
Service Subcategory -Buildings & Property - Opex	Building and Property operating expenditure classified as non-network in TransGrid's regulatory accounting statements.	TransGrid financial records reported from Ellipse and Business Reporting. TransGrid includes other non-network opex as overheads (as in RIN 2.1 Expenditure Summary), hence the amount here is zero.	No	N/A	No assumptions were made.
Service Subcategory -Other - Capex	Miscellaneous Plant, fleet and Office Machines reported included in portfolio grouping "Support – Plant & Equipment" and items applicable within "Support – Motor Vehicles"	TransGrid financial records reported from Ellipse and Business Reporting. Information was extracted from the Finance Data Cube.	No	N/A	No assumptions were made.
Service Subcategory -Other- Opex	Other non network operating expenditures	TransGrid financial records reported from Ellipse and Business Reporting. TransGrid includes majority of other non-network opex as overheads (as in RIN 2.1 Expenditure Summary), with the exception of opex costs associated with	No	N/A	No assumptions were made.

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
		miscellaneous fleet assets.			

Approved by: Boon Thiow, Group Financial Controller (items related to RIN Schedule 2.6.1)
Approved by: Stuart Barber, Chief Information Officer (items related to RIN Schedule 2.6.2)
Approved by: Sunny Bhasin, Manager / Training Logistics & Property (items related to RIN Schedule 2.6.3)

7.3.6 Worksheet 2.7 Vegetation Management

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
Route Line Length Within Zone (KM)	The length of line routes. Where a line is a double circuit or split phase line, that section of the route is only counted once.	TransGrid Asset Management Information System (TAMIS).	No	Span lengths for all circuits were extracted from TAMIS. Route length was averaged from the two spans attached to dual circuit structures and added to single circuit spans.	Only a single vegetation zone is used, as TransGrid's network is not subject to different systems or regulations for different areas of the state. No underground cable route length is included.
Total number of maintenance spans	Where the contractor has claimed and been paid for maintenance work in a span, or where self-performed work has been undertaken during the FY, it is counted as a maintenance span.	The data is sourced from the vegetation maintenance contractors who are contracted to perform maintenance work for TransGrid, in addition to self-performed work by TransGrid easement officers. The contractors prepare an invoice input spreadsheet as part of their invoices submitted for vegetation maintenance. In regards to self-performed work, logs from work completed by internal staff where vegetation maintenance occurred on the spans were also added to the list of maintenance spans. Previous RIN's did not have this data.	No	A count of spans where payment has been claimed by the contractors. The data is calculated from invoices where the vegetation maintenance contractors have claimed against contract rates for work carried out on each span. Where TransGrid easement officers have trimmed lopped or sprayed a tree or trees during a line inspection and this information has been recorded by them in their work logs, it will also be included as a maintenance span. The data was cross-checked to ensure a span was not counted twice if it was noted on multiple invoices of internal works schedule.	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
Total Length of Maintenance Spans (KM)	The total length of the spans counted as Maintenance Spans	Span lengths are sourced from TransGrid's TAMIS database.	No	A sum of span lengths for each span counted as a Maintenance Span.	The whole span length is counted for each Maintenance Span. TransGrid does not directly record the length of the areas that were maintained in the spans.
Average number of trees per maintenance span (0's)	Average number of trees per maintenance span is the number of trees maintained in that span, as trees not maintained are not counted.	Determined during scoping stage of works(described in detail in this item) tree count estimates are included on the work plans. If this tree count estimate was not available then the number of trees was calculated using the contractor invoices, as the tree cutting rates are based upon hectare rates and hourly rates. The data is sourced from the vegetation maintenance contractors who prepare an invoice input spreadsheet (schedule of rates) as part of their invoices submitted for vegetation maintenance. These input spreadsheets also contain the scoping stage tree counts noted on the work plan. Where TransGrid staff has maintained vegetation during a line inspection this information has been recorded it has been included in the tree counts. The basis for the internal counts is	Yes During the scoping phase of the works an attempt is made to gauge the number of trees 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 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 contractors actually count the individual trees. When this estimate was not completed (new method in FY2016) was not completed, the contractor invoice was used. The contractor invoices are based upon contract rates by either hectare or hourly rates. Work amounts for hectare rate work are agreed with the contractor before work based upon vegetation	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 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 contractors actually count the individual trees. This was a new initiative introduced during FY16. To review this new method a sample of the calculated count of trees was carried out as follows: A database of unique spans and associated tree count actuals was compiled for the entire network. A seeding process was undertaken to	When this estimate was not completed the contractor invoice was used. The transition from using the contract rates to the measured value occurred around October 2015. For hectare rates, the following vegetation crown densities apply: • Scattered is <5% coverage, use 3% • Light is 5-15% coverage, use 10% • Medium is 15-25% coverage, use 20% • Heavy (or high) is >25% coverage, use 40% as an average • Slashing is taken to be 40% coverage as slashing can only be used where trunks are less than 75mm thick at the cutting level. Vegetation crown sizes are estimated as the following:

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
		based off defect work orders and diary entries. Previous RIN's did not count internal works. Accounts Payable reports provided lists of invoices paid on each vegetation management work order. This was reconciled against invoice spreadsheets to ensure that the complete list of invoices was used in the preparation.	densities in an agreed format. These vegetation densities are used to determine a coverage percentage and an estimate of a number of trees to be maintained based upon canopy size. Hourly rate work has been estimated to be able to maintain certain numbers of trees per hour using the various types of maintenance.	determine a nominal sample size of 300. Of these a sample size of approximately 16% of the maintenance spans with a fairly even split between each region. The accuracy of the actual tree counts was achieved by comparing the reported figures with: a. Work plans generated in the planning of the maintenance (specifying intended work activities) b. Invoice items for contractor claims (including actual areas maintained and work methods used) c. Aerial imagery to validate the landscape type and time-lapse changes to vegetation on easement d. Easement officer discussions where necessary. e. LIDAR reports where necessary. Some spans identified too many trees, some too few, but in an overall sense the figures were deemed reasonable. Where a new estimate was unavailable, as per the previous RIN, the count was determined using contractor invoices (input spreadsheets) as follows: Hourly rate total hours are converted to trees using a 'trees per hour' figure for the various maintenance activities as	• Hectare Hand Clearing – 4 m^2 crown – 2500 trees/hectare @100% coverage • Hectare Mulching – 2 m^2 crown – 5000 trees/hectare @100% coverage • Hectare Slashing or Spraying – 2 m^2 crown – 5,000 trees/hectare @100% coverage For hourly rates, the following progress is estimated: • Hand clearing – 10 trees per hour • Hand clearing > 18° Slope – 5 trees per hour • 'Drive Through' – 10 trees per hour - Where a contractor goes with the inspector and trees are removed at the time • Spraying – 15 trees per hour, or 30 trees per hour with a spray truck • Slashing – 500 trees per hour • Pruning by climbing – 1 tree per hour • Pruning by EWP – 2 trees per hour • Tritter/Excavator – 70 trees per hour

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
				per the 'Assumptions made to allow calculation / estimation of the variable' column.' Hectare rate total hectares maintained as per the supporting schedules of the contractor invoices are converted to trees by a vegetation coverage density percentage multiplied by a number of trees per hectare at 100% coverage based on crown size suitable for the type of maintenance.	• Small Mulcher – 20 trees per hour • Medium Mulcher – 75 trees per hour • Large Mulcher – 100 trees per hour • Mechanical Pruning (Jaraff, etc) – 50 trees per hour
Length of Vegetation Corridors (KM)	The length of land upon which vegetation is maintained not including grassland/farmland and gullies where vegetation is not maintained.	NSW Transmission System and TransGrid Asset Management Information System (TAMIS). Vegetation, ground and conductor survey data identified from Aerial Laser Surveys LiDAR. Data was not provided by the service provider by the deadline so FY2014/15 RIN values were used.	Yes TransGrid does not directly record vegetation types on easements or spans where no vegetation management is required. The figure is based upon the same proportional calculation as previous RIN years. The length is rounded to the nearest 100km.	TransGrid's LiDAR data provides laser survey points on vegetation greater than 1m in height. This has been used to identify "vegetated zones" on transmission line easements. This data is loaded against TransGrid's easements in the TAMIS GIS application and the total length is calculated. Gullies are removed from the vegetated length through a rough approximation of conductor sag along a transmission line. This is documented in the calculation spreadsheet.	It is assumed that a Gully is an area where the span length is larger than 300m and the approximate ground height is lower than approximate conductor sag + 10m. It is assumed that a "vegetated zone" is any area which has at least 1 vegetation survey point within $1m^2$ A proportion of the network that is a "Vegetation Corridor" is calculated from LiDAR data available as at October 2014. As a result, it is extrapolated to the remainder of the line route length. As future LiDAR data is available, the accuracy of the estimation will improve.

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
Average Width of Vegetation Corridors (Metres)	The average width of land along which vegetation is maintained.	NSW Transmission System and TransGrid Asset Management Information System (TAMIS). No significant changes in network since FY2014/15 RIN, so same value provided.	Yes TransGrid does not directly record vegetation corridor widths for every section of lines.	The standard easement width for the line voltage is multiplied by the length of vegetation corridor above per span, then the sum of these areas is divided by the total length of vegetation corridors.	It is assumed that combined easements which occur generally in the vicinity of substations does not materially affect the average width of vegetation corridors and has not been considered in the calculation. The widths are calculated from the spans that have LiDAR data as at October 2014 as per the length of vegetation corridors above.
Average Frequency of Cutting Cycle (Years)	The straight average of the vegetation maintenance period for each transmission line for the appropriate year. No weighting for line length was used.	Transmission Line Maintenance Plan contains the maintenance frequency tables. There was no change to the maintenance plan since the FY2014/15 RIN. Same values provided.	Yes	The vegetation maintenance cycle in years was listed for each circuit, then the average was taken. All lines were included in all years, not just those with Vegetation Maintenance Spans.	Where lines cross regional boundaries, the maintenance frequency for the region with the longer portion of the line was chosen. Line length was not taken into account, a 'simple' average was taken, as per the instructions: "The average vegetation Maintenance Span Cycle can be calculated based on a simple average of all the Maintenance Span Cycles".
Tree Trimming ($000's) Vegetation Corridor Clearance ($000's)	Expenditure that occurs in the management of individual trees. Expenditure that occurs in the management of areas of the easement other than individual trees.	TransGrid's Regulatory Accounts 'Land & Easement Maintenance' Ellipse Financial Data Ellipse Work Order Data Ellipse Standard Job Data Easement Contractor Invoices The data used to disaggregate	Yes	To calculate the split between the categories required by the worksheet, the total 'Land and Easements' category reported in the Regulatory Accounts has been disaggregated based on analysis of the work orders. Standard Jobs on the work order have been used to identify the categorisation (inspection, other or maintenance).	Where the TransGrid line inspector has identified and consequently trimmed/removed one or more trees during a line inspection, it is not a significant tree trimming cost. The proportion of work classified as tree trimming is 2.13 times that of the vegetation corridor clearance based on the proportion of the split of dollars

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 total is sourced from Materials and expenses recorded against vegetation management work orders in Ellipse.		The total Routine and Non-Routine Materials and Expense for easement maintenance work is the Contractor costs for managing easement vegetation. The vegetation maintenance contractors prepare an invoice input spreadsheet as part of their invoices submitted for vegetation maintenance. This has been used to calculate the split between Tree trimming and Vegetation corridor clearance for all vegetation management expenses recorded in the TransGrid system. The proportion of the split of dollars based on the underlying activities performed by the contractors is calculated from the proportion of work carried out on individual trees (generally hand clearing) or on an area of trees (generally machine clearing).	per the underlying activities performed by the contractors as calculated from the proportion of work carried out on individual trees or on an area of trees.
Inspections ($000's)	Expenditure solely for the inspections for vegetation management.	TransGrid's Regulatory Accounts 'Land & Easement Maintenance' Ellipse Financial Data Ellipse Work Order Data Ellipse Standard Job Data	No	All costs recorded against vegetation inspection work orders.	These inspection jobs include a small portion of contractor liaison costs as some inspection jobs are completed in conjunction with the contractor.
Audits ($000's)	Expenditure solely for the purpose of auditing	TransGrid does not record the proportion of its costs on Audit separately from the Contractor	N/A	Auditing on contractor work occurs at the same time as supervision of the contractor on site and so TransGrid	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
	vegetation management.	Liaison expenditure.		does not record expenditure on audits of vegetation separately. Costs will be included in contractor liaison expenditure.	
Contractor Liason Expenditure ($000's)	Expenditure that occurred during the management of external contractors for vegetation management	TransGrid's Regulatory Accounts 'Land & Easement Maintenance' Ellipse Financial Data Ellipse Work Order Data Ellipse Standard Job Data The data used to disaggregate the total is sourced from Labour recorded against vegetation management work orders in Ellipse.	Yes The total labour cost against vegetation maintenance reported in TransGrid's Regulatory Accounts and Ellipse has been used.	Any labour and expenditure costs recorded by TransGrid staff against vegetation maintenance work orders. Includes costs of auditing contractor work which occurs at the same time as the supervision of the contractor on site.	This does not include any contractor liaison costs incurred during inspection work.
Other vegetation management expenditure ($000's)	Other vegetation management expenditure which has not been captured by the previous fields. Aerial Laser Survey costs for the TransGrid network.	TransGrid's Regulatory Accounts 'Land & Easement Maintenance' and Ellipse reports. Costs recorded against Aerial Laser Survey work orders.	No	Any labour and expenditure costs recorded by TransGrid staff against aerial laser survey work orders.	All vegetation maintenance expenditure outside the Routine LiDAR scanning has been captured in the other fields.
Number of fire starts caused by vegetation grow-ins (NSP responsibility) (0'S)	Fires caused by electrical faults due to growth of vegetation within TransGrid's vegetation management corridor.	THEOS - TransGrid's Outage Management System.	No Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE", "Fire" or "Bushfire" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.

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
Number of fire starts caused by vegetation blow-ins and fall-ins (NSP responsibility) (0'S)	Fires caused by electrical faults due to vegetation within TransGrid's vegetation management corridor falling or blowing into the transmission line.	THEOS - TransGrid's Outage Management System.	No Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE", "Fire" or "Bushfire" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.
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Number of outages caused by vegetation blow-ins and fall-ins (NSP responsibility) (0'S)	Outages caused by electrical faults due to vegetation within TransGrid's vegetation management corridor falling or blowing into the transmission line.	THEOS - TransGrid's Outage Management System.	No Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.
Number of fire starts caused by vegetation grow ins (OTHER PARTY RESPONSIBILITY) (0'S)	Fires caused by electrical faults due to growth of vegetation outside of TransGrid's vegetation management corridor.	THEOS - TransGrid's Outage Management System.	No Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE", "Fire" or "Bushfire" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.
Number of fire starts caused by vegetation blow-ins and fall-ins (OTHER PARTY RESPONSIBILITY)	Fires caused by electrical faults due to vegetation outside of TransGrid's vegetation management corridor falling or blowing	THEOS - TransGrid's Outage Management System.	No Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE", "Fire" or "Bushfire" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.

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
(0'S)	into the transmission line.				
Number of outages caused by vegetation grow-ins (OTHER PARTY RESPONSIBILITY) (0'S)	Outages caused by electrical faults due to growth of vegetation outside of TransGrid's vegetation management corridor.	THEOS - TransGrid's Outage Management System.	No Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.
Number of outages caused by vegetation blow-ins and fall-ins (OTHER PARTY RESPONSIBILITY) (0'S)	Outages caused by electrical faults due to vegetation outside of TransGrid's vegetation management corridor falling or blowing into the transmission line.	THEOS - TransGrid's Outage Management System.	No Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.

Approved by: Lance Wee, Manager / Asset Strategy

7.3.7 Worksheet 2.8 Maintenance

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
Transmission Lines Maintenance Transmission Towers and transmission towers support structures Asset Quantity at year end 2015-16	The number of transmission structures (including steel towers, wood poles, concrete poles and steel poles) on TransGrid's network. The number of transmission support structures on TransGrid's network.	TransGrid Asset Management Information System (TAMIS).	No	Structure counts were totalled from TAMIS reports	There are no support structures on TransGrid's network that are recorded or maintained separately to the structures.
Transmission Lines Maintenance Conductors Asset Quantity at year end 2015-16	The route length of conductors on TransGrid's transmission network.	TransGrid Asset Management Information System (TAMIS).	No	Span lengths for all circuits were extracted from TAMIS. Route length was averaged from the two spans attached to dual circuit structures and added to single circuit spans.	N/A
Transmission Lines Maintenance	The route length of transmission cables on TransGrid's network based on operating voltage.	Electrical Data Book (HV Cables). Drawings (132kV HV Cables within	Yes	Cable route lengths were from the Electrical Data Book and calculated from drawings.	The Electrical Data Book is used for lengths of 330kV cables. 132kV underground cables within substations are

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
Underground Cables Asset Quantity at year end 2015-16		substations).			estimated off substation layout drawings. Note that Cables 43/44 share the same route, so the length has only been included once. It was classified as a dual circuit underground cable when it was added in the 2015FY RIN 2.3 AUGEX. In the 5.3 age profile Cable 43 and 44 are counted as separate circuits.
Transmission Lines Maintenance Transmission Towers and transmission towers support structures Asset Quantity Inspected /Maintained 2015-16	The number of transmission structures (including steel towers, wood poles, concrete poles and steel poles) inspected / maintained on TransGrid's network.	BR199 - Routine Maintenance Achievement reports (from The Wire).	Yes Inspection jobs are recorded against a standard job that identifies structures in discrete quantities for maintenance purposes (25, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 700 for ground inspections). These quantities are used to estimate the number of structures inspected in each standard job.	Maintenance Scheduled Tasks are setup each year according to TransGrid's Transmission Line Maintenance Policy these will create appropriate work orders each year. The work orders for routine maintenance for each work group in each financial year can be viewed in the BR199 Routine Maintenance Achievement report. The number of structures is the sum of the standard job structure quantity if the work order was a ground inspection.	TransGrid conducts aerial inspections of every structure annually with the exception of the far west 220kV network which is inspected by air once every two years. For the purpose of this RIN structure inspections are only counted for ground inspections (same as previous).

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
Transmission Lines Maintenance Conductors Asset Quantity Inspected /Maintained 2015-16	The route length of conductors on TransGrid's transmission network.	BR199 - Routine Maintenance Achievement reports (from The Wire).	No	Where a work order existed for a thermovision inspection the length of this line (from TAMIS Span report) was included in the conductor inspected count.	TransGrid conducts aerial inspections of every structure annually with the exception of the far west 220kV network which is inspected by air once every two years. For the purpose of this RIN conductor inspections are only counted if the line was subject to a thermovision or specific OHEW corrosion inspection. There were a number of lines which were subject to a thermovision in 2016FY.
Transmission Lines Maintenance Underground Cables Asset Quantity Inspected /Maintained 2015-16	The route length inspected / maintained of transmission cables on TransGrid's network.	Cable data summary spreadsheet.	No	100% of the underground cable network is inspected yearly, so the quantity inspected is equivalent to the total amount of UG cable assets.	Note that Cables 43/44 share the same route, so the length has only been included once. It was classified as a dual circuit underground cable when it was added in the 2015FY RIN 2.3 AUGEX. In the 5.3 age profile Cable 43 and 44 are counted as separate circuits.
Transmission Lines Maintenance Transmission Towers and transmission towers support structures	The average age of transmission structures on TransGrid's network.	TransGrid Asset Management Information System (TAMIS).	Yes The age of structures and conductors is estimated based on various sources, mainly for the older lines where construction data is not well	The age of each structure is calculated, then the sum of these is divided by the number of structures.	Generally, maintenance replacements of a wood pole in a two pole structure are not included in the age of the structure. Where a new structure is known to have been installed, it is included.

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
Average Age of Asset Group 2015-16			recorded.		
Transmission Lines Maintenance Conductors Average Age of Asset Group 2015-16	The average age of conductors on TransGrid's transmission network.	TransGrid Asset Management Information System (TAMIS).	Yes The age of structures and conductors is estimated based on various sources, mainly for the older lines where construction data is not well recorded.	For conductors and cables, the average age is calculated on a per kilometre basis.	For cables and conductors, average age per kilometre is assumed as the requested value by the AER.
Transmission Lines Maintenance Underground Cables Average Age of Asset Group 2015-16	The average age of transmission cables on TransGrid's network. This is a weighted average based on circuit length	Electrical Databook (HV Cables). Drawings (132kV HV Cables within substations).	No	For conductors and cables, the average age is calculated on a per kilometre basis.	For cables and conductors, average age per kilometre is assumed as the requested value by the AER.
Transmission Lines Maintenance Transmission	The average frequency of inspection on transmission structures in TransGrid's network.	The Transmission Line Maintenance Plan contains the inspection frequency tables for transmission line structures.	Yes. Where lines cross regional maintenance boundaries, there may be a variation in the	The inspection cycle in years was listed for each circuit, then the average of the ground inspection was taken. This is a weighted average	TransGrid conducts aerial inspections of every structure annually with the exception of the far west 220kV network which is inspected by air once every two years.

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
Towers and transmission towers support structures Inspection Cycle			designated inspection frequency as the general situation of the line changes. The frequency chosen for these lines was the frequency for the longer line section. The impact of these few lines on the overall average is minimal.	based on the number of structures.	It is assumed that inspections from ground was the required method.
Transmission Lines Maintenance Conductors Inspection Cycle	The average frequency of inspection on conductors in TransGrid's network. Only specific conductor inspections included	The Transmission Line Maintenance Plan contains the inspection frequency tables for conductors.	Yes	The inspection cycle in years was listed for each circuit, then the average was taken. This is a weighted average based on the number of structures.	TransGrid conducts aerial inspections of every structure annually with the exception of the far west 220kV network which is inspected by air once every two years. Only conductor specific routine inspections are considered, such as thermovision inspections.
Transmission Lines Maintenance Underground Cables Inspection Cycle	The average frequency of inspection on cables in TransGrid's network on a length based weighted average.	The Underground Cable Assets Maintenance Plan contains the inspection frequency tables for cables and associated infrastructure.	No	For underground cables the whole route inspection for each cable was listed. Inspection cycle was given as a weighted sum of the circuit length.	Cables – Inspection was assumed as the whole route patrol.

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
Transmission Lines Maintenance Transmission Towers and transmission towers support structures Maintenance Cycle	The average frequency of maintenance on transmission structures in TransGrid's network.	The Transmission Line Maintenance Plan contains the maintenance frequency tables for transmission line structures and conductors.	Yes As not all transmission structures receive maintenance (e.g. grillage or UGI) they are not included in the average calculation.	The inspection cycle in years was listed for each circuit, and then the average was taken. When a line has more than one inspection type the most expensive was selected. Lines which have no routine maintenance (no wood poles and no grillage foundations) do not contribute to the average maintenance cycle calculation.	Only routine maintenance is considered. For Transmission Lines there are only routine maintenance conducted on: - Wood Poles (UGIs) - Steel Towers (Grillage Foundations)
Transmission Lines Maintenance Conductors Maintenance Cycle	The average frequency of maintenance on conductors in TransGrid's network.	The Transmission Line Maintenance Plan contains the maintenance frequency tables for transmission line structures and conductors.	No	There is no maintenance activity carried out on transmission line conductors.	Only routine maintenance is considered (defect and condition based excluded).
Transmission Lines Maintenance Underground Cables	The average frequency of maintenance on cables in TransGrid's network on a length based weighted average.	The Underground Cable Assets Maintenance Plan contains the maintenance frequency tables for cables and associated infrastructure.	Yes	For cable maintenance the most expensive maintenance (on an annual basis) type for each circuit was used. Maintenance cycle was given as a weighted sum of the circuit length.	Only routine maintenance is considered.

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
Maintenance Cycle					
Substation Equipment & property maintenance - Asset Quantity Switchbays	Total number of in-service switchbays within TransGrid's substation TransGrid has interpreted this data requirement to be similar to that used for worksheet 5.2 – ie: as a requirement to identify the population age profile of the switchbays installed as at the end of the financial year.	Ellipse TRB 601 REPORT Extract Tracing information	No	Sum of all in-service Ellipse bays shown as in service as at the end of the specified financial year. 'Non-real' Ellipse bays created for the purpose of the data model are excluded.	Switchbays in negotiated (third party) substations are excluded.
Substation Equipment & property maintenance - Asset Quantity (Inspected / Maintained) Switchbays	Total number of switchbays (excluding transformer bays) maintained routinely in the last financial year.	Ellipse TRR620 REPORT and the list produced above.	No	Sum of all switchbays which have been included in the list produced above and have routine maintenance work orders completed (closed) in the last financial year.	Only work orders that are related to major plants in substation (Busbar, Capacitor Bank, Circuit Breaker, Current Transformer, Isolator/ (Disconnector), Reactor, SVC and Voltage Transformer) which are classified as routine maintenance are used.
Substation Equipment & property maintenance - Asset Quantity	Total number of in-service transformers within TransGrid's substation.	The Excel file '2015TransFormerWorkSheet' Ellipse:	No	Sum of all in-service transformers commissioned prior to the end of the specified financial year. A valid list of transformers	When relocations were known to have happened, it was assumed that transformers were moved at the end of a financial year and for a replacement, no overlap was shown. Spare transformers temporarily connected to facilitate

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
Power transformers		Equipment Register Tracing Data Nameplate Data System operating diagrams and amendments GM AS S1 009 and amendments – In-Service and Spare Power Transformers and Reactors Equipment Manuals		current at June 2016 was compiled. 1. Non-current records were filtered from the equipment register data and reviewed to remove a small number of errors. Process capacity values and crosscheck Nameplate ratings for each transformer was processed to a simple list form and this was then linked to the equipment register on equipment identifier and ratings reviewed and possible errors checked using operating diagram amendments. 2. Trace each year's data Tracing data was used to identify transformers in service for each financial year in the required range using the 2015 RIN information as the base. System spares were cross checked using the document "In service and spare transformers and reactors".	project staging were considered as remaining as spares. The quoted year is assumed to be the second year of a financial year period – e.g.: 2006 = FY 2005/06. 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.

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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
Substation Equipment & property maintenance - Asset Quantity (Inspected / Maintained) Power transformers	Total number of transformers maintained routinely in the last financial year.	Ellipse TRR620 REPORT and the list produced above.	No	Sum of all transformers which have been included in the list produced above and have routine maintenance work orders completed (closed) in the last financial year.	Only work orders that are related to power transformers in substation (exclude Auxiliary Transformer) which are classified as routine maintenance are used.
Substation Equipment & property maintenance - Asset Quantity Substation - Property	All prescribed substations under TransGrid's ownership.	Quantity of TransGrid's owned substations has been created by an update of the previously submitted list. This can be verified from the schedule of operating diagrams. The original list is sourced from excel file 'Substation Age from NMR' and TransGrid's network management plan, adjusted for changes during the year.	No	Sum of all in-service substations prior to the end of the specified financial year	N/A
Substation – Property Asset Quantity Inspected Maintained	Number of substation Properties inspected in each year.	Ellipse Work Order Data.	No	The figure reported for ASSET QUANTITY - INSPECTED/ MAINTAINED has been capped at the total number of Substation Properties.	TransGrid notes that for some assets, such as substation property, different types of maintenance are conducted several times per year under different work orders. Where this has occurred, TransGrid only counted the asset as having been maintained once.

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
Substation Equipment & property maintenance - Average Age Switchbays	Average age of in service switchbays.	Ellipse TRB 601 REPORT. Extract Tracing information.	Yes	Sum of total in service years of all switchbays divided by total number of switchbays which are commissioned prior to the end of the specified financial year.	Assumed: 1. Commission dates for all switchbays recorded in Ellipse are accurate; and 2. Age of the switchbay does not change regardless of whether any HV plants within the switchbay has been replaced.
Substation Equipment & property maintenance - Average Age Power transformers	Average age of in service transformers.	The Excel file '2015TransFormerWorkSheet' Ellipse: Equipment Register Tracing Data Nameplate Data System operating diagrams and amendments GM AS S1 009 and amendments – In-Service and Spare Power Transformers and Reactors Equipment Manuals	Yes This spreadsheet has also been used to provide Economic Benchmarking RIN data.	A valid list of transformers current at June 2016 was compiled. 1. Non-current records were filtered from the equipment register data and reviewed to remove a small number of errors. Process capacity values and crosscheck. Nameplate ratings for each transformer was processed to a simple list form and this was then linked to the equipment register on equipment identifier and ratings reviewed and possible errors checked using operating diagram amendments. 2. Trace each year's data	When relocations were known to have happened, it was assumed that transformers were moved at the end of a financial year and for a replacement, no overlap was shown. Spare transformers temporarily connected to facilitate project staging were considered as remaining as spares. The quoted year is assumed to be the second year of a financial year period – eg: 2006 = FY 2005/06. 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.

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
				Tracing data was used to identify transformers in service for each financial year in the required range using the 2015 RIN information as the base. System spares were cross checked using the document "In service and spare transformers and reactors". For consistency, the Excel file '2015TransFormerWorkSheet' used previously for Economic Benchmarking RIN, was reused for Substation Power Transformers.	
Substation Equipment & property maintenance - Average Age Substation – Property	All prescribed substations under TransGrid's ownership. Substation Age based on Initial Commissioning Date	Quantity of TransGrid's owned substations has been created by an update of the previously submitted list. This can be verified from the schedule of operating diagram. The original list is sourced from excel file 'Substation Age from NMR'.	Yes	Sum of all in-service substations prior to the end of the specified financial year.	Based on definition. Definition does not consider significant augmentation or replacement
Substation Equipment & property maintenance - Inspection and	N/A	MAINTENANCE PLAN – SUBSTATION ASSETS Section 7.1.2 Six Monthly Substation Inspections. MAINTENANCE PLAN – SUBSTATION	No	As per TransGrid maintenance policy.	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
Maintenance Cycles Switchbays		ASSETS MAINTENANCE PLAN – SUBSTATION ASSETS Section 8.4 Service Interval for Circuit Breaker & Section 2.6 Ancillary Equipment.			
Substation Equipment & property maintenance - Inspection and Maintenance Cycles Power transformers	N/A	MAINTENANCE PLAN – SUBSTATION ASSETS MAINTENANCE PLAN – SUBSTATION ASSETS Section 7.1.2 Six Monthly Substation Inspections. MAINTENANCE PLAN – SUBSTATION ASSETS MAINTENANCE PLAN – SUBSTATION ASSETS Section 7.1.2 Six Monthly Substation Inspections.	No	As per TransGrid maintenance policy.	N/A
Substation Equipment & property maintenance - Inspection and Maintenance Cycles Substation – Property	N/A	MAINTENANCE PLAN – SUBSTATION ASSETS MAINTENANCE PLAN – SUBSTATION ASSETS Section 7.1.1 Minor Substation Inspections. MAINTENANCE PLAN – SUBSTATION ASSETS MAINTENANCE PLAN – SUBSTATION ASSETS – reference to Fire Protection Manual Operations and Maintenance.	No	As per TransGrid maintenance policy.	N/A
SCADA & Control maintenance – Asset Quantity	The Number of Control IEDs on the Network	Information extracted from Ellipse system. Data is updated within Ellipse upon completion of commissioning works.	No	Information extracted from Ellipse system. Data is updated within Ellipse upon completion of commissioning	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
		Filtering is carried out to limit assets to those applicable.		works. Filtering is carried out to limit assets to those applicable. Filtered for Data Acquisition and Control equipment.	
Protection Systems Maintenance – Asset Quantity	The Number of Major Protection Relays on the Network	Information extracted from Ellipse system. Data is updated within Ellipse upon signature of commissioning documents.	No	Information extracted from Ellipse system. Data is updated within Ellipse upon signature of commissioning documents.	N/A
Telecommunication Systems – Asset Quantity	The Number of Terminal Equipment, MUXs, Base Stations on the Network	All Telecommunications assets data extracted from Ellipse. Filtering is carried out to limit assets to those applicable.	No	All Telecommunications assets data extracted from Ellipse. Filtering is carried out to limit assets to those applicable. Filtered for terminal equipment, PLC, VF Intertrips, Base Stations, microwave assets. Excludes MW towers.	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
Metering Systems – Asset Quantity	The number of Meters on the System	All metering information extracted from Ellipse system.	No	All metering information extracted from Ellipse system.	N/A
SCADA & Control, Communications, Protection, Metering – Asset Inspection and Maintenance Quantity	The number of maintenance and inspection tasks carried out for the financial year	Direct extraction from Ellipse of all relevant work orders with a planned start date and completion date in FY2015/16	No	Direct extraction from Ellipse of all relevant work orders with a planned start date and completion date in FY2015/16	N/A
SCADA & Control maintenance – Average Age	The average of all Control IEDs in service based on available replacement date.	Based on a combination of Ellipse records and Asset manager estimates where records are incomplete	Yes	The average was taken based on the estimated commissioning date data from Ellipse.	Where only a year was recorded for installation date – it is assumed this date to be the end of the financial year. As recorded years have a proposed economic life of 15 years, this has been used throughout (e.g. if replacement year proposed is 2025 then assumed install date is 30/06/2010). BFS, BFN, BFW, GUR, HYM, WDL, YSN taken as commissioning date of site (site control equipment install at the time of substation project). Where no year is recorded, assets are firstly assigned the same years as equivalent assets at the same site. Where this is not available, the years that a particular item was available for installation is spread evenly across all assets without a date. (E.g. if MD300 assets were available for purchase between 2009 and 2015 and there are 120 units with no date, the 20 would be

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
					assigned 30/06/2009, 20 would be assigned 30/06/2010 and so on. Availability has been provided by the procurement group and again, is an estimate of available years due to inadequate record keeping historically. Numbers for 2015/16 adjusted to match repex numbers (section 2.2) and difference moved to 2014/15, this is due to the limitations of the estimation methodology used.
Protection Systems Maintenance – Average Age	The average of all main protection relays in service based on available installation date.	Data from Ellipse Commissioning Date. Date stored in "Purchase date" field	No	The average was taken based on the commissioning date data from Ellipse.	Assumed that records are up to date
Telecommunication Systems – Average Age	The average of all telecoms Terminal equipment in service	Based on a combination of Ellipse records and Asset manager estimates where records are incomplete	Yes	The average was taken based on the commissioning date data from Ellipse. Where only a year was recorded for installation date – it is assumed this date to be the end of the financial year.	Where only a year was recorded for installation date – it is assumed this date to be the end of the financial year. As recorded years have a proposed economic life of 15 years, this has been used throughout (e.g. if replacement year proposed is 2025 then assumed install date is 30/06/2010) Where no year is recorded, assets are firstly assigned the same years as equivalent assets at the same site. Where this is not available, the years that a particular item was available for installation is spread evenly across all assets without a date. (E.g. if Sagem assets were available for purchase between 2009 and 2015

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
					and there are 120 units with no date, the 20 would be assigned 30/06/2009, 20 would be assigned 30/06/2010 and so on. Availability has been provided by the procurement group and again, is an estimate of available years due to inadequate record keeping historically. Numbers for 2015/16 adjusted to match repex numbers (section 2.2) and difference moved to 2014/15, this is due to the limitations of the estimation methodology used.
Metering Systems – Average Age	The average of all market meters in service based on available installation date.	Data extracted from Ellipse system	No	The average was taken based on the commissioning date data from Ellipse.	N/A
SCADA & Control maintenance – Inspection and Maintenance Cycles	Average time in years for a single Control Asset to be inspected/ maintained.	D2014/12155 SSA Plan - Maintenance - Routine and Non-routine - Substation Automation Systems	No	N/A	No regular inspection cycle for control equipment.
Protection Systems Maintenance – Inspection and Maintenance Cycles	Average time in years for a single Protection Asset to be inspected/ maintained.	D2014/12155 SSA Plan - Maintenance - Routine and Non-routine - Substation Automation Systems	Yes	The relay population broken down by population and asset type was measured against the maintenance frequency as stated in the Maintenance Plan to establish a single figure for Maintenance frequency.	No regular inspection cycle for protection equipment.

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
Telecommunication Systems – Inspection and Maintenance Cycles	Average time in years for a single Telecoms Asset to be inspected/ maintained.	D2014/14158 SSA Plan - Maintenance - Routine and Non-routine - Telecommunications Systems	Yes	Inspection figures averaged per site basis in Appendices B & C of the Maintenance Plan. Figures for Maintenance taken directly from the plan	Majority of assets have a 3/4 year cycle. As such, 3 years was taken as the estimate as some assets have a shorter maintenance cycle (1-2 years). Based on best judgement, 3 years frequency is a confident estimate. Due to recent changes in site requirements, inspection intervals taken as 6monthly to represent the requirements for fire extinguishers.
Metering Systems – Inspection and Maintenance Cycles	Average time in years for a single Metering Asset to be inspected/ maintained.	D2014/12155 SSA Plan - Maintenance - Routine and Non-routine - Substation Automation Systems	Yes	Figures come directly from Maintenance Plan	Inspections are estimated at 2.5 yearly as per Rule for market meter inspections/independent checks Maintenance are estimated at 5 yearly as per Rules Market Meter Accuracy
Routine Maintenance Direct Costs	Labour and Expense costs on routine maintenance of equipment consistent with the definitions used in the Opex model	TransGrid's Regulatory Accounts Ellipse Financial Data Ellipse Work Order Data Ellipse Standard Job Data Opex model configuration	Yes	To calculate the split between the categories required by the worksheet, the total 'Maintenance' category reported in the Regulatory Accounts has been disaggregated based on analysis of the work orders. Labour, materials and expenditure costs recorded by TransGrid staff against routine maintenance and inspection work orders. Standard Jobs and	It is assumed that Inspection costs are included under Routine Maintenance Direct Costs. Standard Job and Component Code table is used to define the classifications. Insulator and fittings have been included as part of routine maintenance on structure costs. Property costs at radio repeater communications sites have been included under telecommunications systems. Reconciliation with Opex Model is a complex process. As there were some maintenance costs that were not allocated to a particular TransGrid work order, some interpretation was involved in allocating such costs.

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
				Component Codes on the work order have been used to identify the asset classification Where the asset classification cannot be determined from the standard job or component code, the individual work orders costs have been classified. Costs not able to be directly allocated to a category have been allocated on a percentage split basis across the classifications.	The change of ownership of TransGrid has resulted in some of the work performed being outside normally set up work orders.
Non-Routine Maintenance Direct Costs	Labour and Expense costs on defect and MOPS maintenance of equipment consistent with the definitions used in the Opex model	TransgGrid's Regulatory Accounts Ellipse Financial Data Ellipse Work Order Data Ellipse Standard Job Data Opex model configuration	Yes	To calculate the split between the categories required by the worksheet, the total 'Maintenance' category reported in the Regulatory Accounts has been disaggregated based on analysis of the work orders. Labour, materials and expenditure costs recorded by TransGrid staff against routine maintenance and inspection work orders. Standard Jobs and	Major operating projects (MOPS) have been included as part of Defect expenses. Standard Job and Component Code table is used to define the classifications Insulator and fittings have been included as part of defect maintenance on structure costs. Property costs at radio repeater communications sites have been included under telecommunications systems Access track maintenance ($621,600.76) has been included under Transmission towers non routine maintenance.

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
				Component Codes on the work order have been used to identify the asset classification Where the asset classification cannot be determined from the standard job or component code, the individual work orders costs have been classified. Costs not able to be directly allocated to a category have been allocated on a percentage split basis across the classifications.	Reconciliation with Opex Model is a complex process. As there were some maintenance costs that were not allocated to a particular TransGrid work order, some interpretation was involved in allocating such costs. The change of ownership of TransGrid has resulted in some of the work performed being outside normally set up work orders.

Approved by: Lance Wee, Manager / Asset Strategy

7.3.8 Worksheet 2.10 Overheads

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 2.10.1 Network Overheads Expenditure Overhead amounts for Prescribed Services	Network overhead expenditure is equal to the following categories from EB RIN 3.2: - Maintenance Support and Asset Management TOPEX0106A - Operations / Control Room TOPEX0107A - Grid Planning TOPEX0107A The Opex line items reported are consistent with TransGrid's Revenue proposal opex line items and definitions.	TransGrid financial records reported from Ellipse and Business Reporting. The prescribed opex component of overheads in RIN 2.10 equals the Network Operations component in the 2015-16 Regulatory Account (DISAGG Inc and DISAGG Opex). Using TransGrid financial records, on which the Regulatory accounts are based, the schedule is prepared. Overhead costs allocated and capitalised are added back to determine the total overhead costs. Maintenance Support and Asset Management Support costs have been allocated based on nature of cost incurred, primarily with reference to the Responsibility Centres.	Yes	Overheads for Asset Management and Maintenance Support are disaggregated into the reported categories by using proportionate allocations. Network overheads related to capital work are calculated based on the overhead recovery (expense element 402) within each regulatory category. The prescribed portion is derived by the proportion of the total overhead recovery (expense element 402) by regulatory category against the overhead charge (expense element 400) for prescribed capital projects.	N/A
Table 2.10.1 Network Overhead expenditure Overhead amounts for	Total Negotiated Overhead expenditure is equal to actual expenditure costed to negotiated Activity Centres and EE400 - *Support Cost*	TransGrid financial records reported from Ellipse and Business Reporting. The negotiated opex component of overheads in RIN 2.10 equals the negotiated overhead component of Other	Yes	N/A	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
Negotiated Services	*Allocation charge*. This expenditure represents the support cost allocated to negotiated projects. Total Negotiated Overhead expenditure is allocated to the following categories based on the proportion split of Prescribed plus Capex Overhead between these categories: - Network Overheads, and - Corporate Overheads	Controllable Costs in the 2015-16 Regulatory Accounts (DISAGG Inc and DISAGG Opex). The negotiated services overhead costs are obtained from account extract filtered by AC, which align with the amounts reported in Regulatory accounts.			
Table 2.10.1 Network Overhead expenditure Overhead amounts for Unregulated Services	Total Unregulated Overhead expenditure is equal to actual expenditure costed to unregulated Activity Centres and EE400 - *Support Cost Allocation charge*. This expenditure represents the support cost allocated to unregulated projects. Total Unregulated Overhead expenditure is allocated to the following categories based on the proportion split of Prescribed plus Capex	TransGrid financial records reported from Ellipse and Business Reporting. The Unregulated opex component of overheads in RIN 2.10 equals the Unregulated overhead component of Other Controllable Costs in the 2015-16 Regulatory Accounts (DISAGG Inc and DISAGG Opex). The unregulated services overhead costs are obtained from account extract filtered by AC, which align with the amounts reported in Regulatory accounts.	Yes	N/A	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
	Overhead between these categories: - Network Overheads, and - Corporate Overheads.				
Table 2.10.2 Corporate Overheads expenditure	Corporate Overhead expenditure is equal to the following categories from the EB RIN 3.2: - Insurance TOPEX0109A - Rates & Taxes TOPEX0110A - Property Management TOPEX0111A - Environmental TOPEX0112A - Corporate Governance TOPEX0113A - Customer Relations TOPEX0114A - Regulatory TOPEX0115A - Finance TOPEX0116A - Information technology TOPEX 0117A	TransGrid financial records reported from Ellipse and Business Reporting. The prescribed opex component of corporate overheads in RIN 2.10 equals the Other Controllable Costs and Self Insurance Costs in the 2015-16 Regulatory Accounts (DISAGG Inc and DISAGG Opex). Using TransGrid financial records, on which the Regulatory accounts are based, the schedule is prepared. Capitalised Corporate overheads are obtained by account extract filtered by AC.	No	N/A Corporate overheads related to capital work are calculated based on the overhead recovery (expense element 402) within each regulatory category. The prescribed portion is derived by the proportion of the total overhead recovery (expense element 402) by regulatory category against the overhead charge (expense element 400) for prescribed capital projects.	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
	- HR & Payroll TOPEX0118A - Self-Insurance TOPEX0119A The Opex line items reported are consistent with TransGrid's Revenue proposal opex line items and definitions.				
Table 2.10.2 Corporate Overheads expenditure Overhead amounts for Negotiated Services	Total Negotiated Overhead expenditure is equal to actual expenditure costed to negotiated Activity Centres and EE400 - *Support Cost Allocation charge*. This expenditure represents the support cost allocated to negotiated projects. Total Negotiated Overhead expenditure is allocated to the following categories based on the proportion split of Prescribed plus Capex Overhead between these categories: - Network Overheads, and - Corporate Overheads.	TransGrid financial records reported from Ellipse and Business Reporting. The negotiated services opex component of Corporate Overhead in RIN 2.10 equals the negotiated overhead component of Other Controllable Costs in the 2015-16 Regulatory Accounts (DISAGG Inc and DISAGG Opex). Using TransGrid financial records, on which the Regulatory accounts are based, the schedule is prepared. Capitalised Corporate overheads are obtained by account extract filtered by AC.	Yes	N/A	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
Table 2.10.2 Corporate Overheads expenditure Overhead amounts for Unregulated Services	Total Unregulated Overhead expenditure is equal to actual expenditure costed to unregulated Activity Centres and EE400 - *Support Cost Allocation charge*. This expenditure represents the support cost allocated to unregulated projects. Total Unregulated Overhead expenditure is allocated to the following categories based on the proportion split of Prescribed plus Capex Overhead between these categories: - Network Overheads, and - Corporate Overheads .	TransGrid financial records reported from Ellipse and Business Reporting. The unregulated services opex component of Corporate Overhead in RIN 2.10 equals the unregulated overhead component of Other Controllable Costs in the 2015-16 Regulatory Accounts (DISAGG Inc and DISAGG Opex). Using TransGrid financial records, on which the Regulatory accounts are based, the schedule is prepared. Capitalised Corporate overheads are obtained by account extract filtered by AC.	Yes	N/A	N/A

Note to Overheads

Overhead expenditures incurred that are attributable to capital works but not directly recorded against individual capital projects are capitalised.
Examples of these overhead costs include review of design standards, management of overall capital program (not directly charged to individual capital project), formulating environmental, property and power system procurement policy and procedures. Typically these costs are incurred in the Asset Management and Project Services business units. These costs are re-allocated to the capital projects through the Support Cost Allocation process.

Approved by: Boon Thiow, Group Financial Controller

7.3.9 Worksheet 2.11 Labour

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
Labour Classification Levels	Assumptions were made to classify labour into AER categories. Details are provided in the note below.	Position Data recorded in Ellipse	Yes	Labour data was extracted from Ellipse	Assumptions were made to classify labour into AER categories. Details are provided in the note below. Labour classifications for the RIN were reviewed in 2015/16 by HR in light of restructures of TransGrid. Some positions were reclassified from Corporate Overheads to Network Overheads, as the work the professionals undertake are more aligned to the AER definitions of what is expected to be reported under network overheads.
ASL	In accordance with the Workforce Profile Report Data Specification. Total Hours Paid for the year times by 7. Then divide by standard work hours per week for a full time job times by the number of days in the reference period.	Workforce Profile Report from Ellipse for the reporting period	Yes	ASL data is obtained from the Workforce Profile Reports using the "FTE for reference period" values	In accordance with the Workforce Profile Report Data Specification. Total Hours Paid for the year times by 7. Then divide by standard work hours per week for a full time job times by the number of days in the reference period. Reclassifications resulted in movement between different categories, whilst terminations resulted in net reductions.

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
Average Productive Work Hours	Overtime Hours is the number of hours of paid overtime worked by the employee during the reference period Total Leave Taken refers to the sum of leave taken by the employee including annual, paid sick leave, unpaid sick leave, carers leave, long service leave, maternity leave, paternity leave, family and community services leave and unpaid leave. Adjusted by % of costs allocated to training	Workforce Profile Report from Ellipse for the reporting period	Yes	(Total Hours Paid + Overtime Hours) - Total Leave Taken	Total Number of Hours Paid Annual Reference Period includes paid leave and excludes workers paid by third parties, unpaid leave, overtime, allowances, and additional hours worked under flex-time. Overtime Hours is the number of hours of paid overtime worked by the employee during the reference period Total Leave Taken refers to the sum of leave taken by the employee including annual, paid sick leave, unpaid sick leave, carers leave, long service leave, maternity leave, paternity leave, family and community services leave and unpaid leave. Adjusted by % of costs allocated to training

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 above information is adjusted by percentage of training labour costs over total labour costs.	
Stand Down Occurrences	A count per employee of how many times they used the Stand Down work codes in the timesheet in Ellipse	Ellipse work codes	Yes	An SQL query was run on the Work Code F1 from Ellipse 8 go live (April 2013) on the MSF891 file.	N/A
Ordinary Time Hours	Total Number of Hours Paid Annual Reference Period includes paid leave and excludes workers paid by third parties, unpaid leave, overtime, allowances, and additional hours worked under flex-time. Total Leave Taken refers to the sum of leave taken by the employee including annual, paid sick leave, unpaid sick leave, carers leave, long service leave, maternity leave, paternity leave, family and community services leave and	Workforce Profile Report	Yes	Using the Total Number of Hours Paid Annual Reference Period from the Workforce Profile report minus the total leave taken from the workforce profile report	Total Number of Hours Paid Annual Reference Period includes paid leave and excludes workers paid by third parties, unpaid leave, overtime, allowances, and additional hours worked under flex-time. Total Leave Taken refers to the sum of leave taken by the employee including annual, paid sick leave, unpaid sick leave, carers leave, long service leave, maternity leave, paternity leave, family and community services leave and unpaid leave. Adjusted by % of costs allocated to training. Divide by FTE (ASL). Calculate average by AER level and category.

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
	unpaid leave. Adjusted by % of costs allocated to training Divide by FTE (ASL) Calculate average by AER level and category				
Ordinary Time Hourly Rate	Gross Earnings /FTE Adjusted by % of costs allocated to training Calculate average by AER level and category NOTE: The data can appear to have outliers as termination payments are included in this rate calculation as they are classified as being 'Labour costs – other earnings'	Workforce Profile Report	Yes	Gross Earnings YTD divided by Ordinary Time Hours.	Gross Earnings /FTE Adjusted by % of costs allocated to training Calculate average by AER level and category NOTE: The data can appear to have outliers as termination payments are included in this rate calculation as they are classified as being 'Labour costs – other earnings'
Overtime Hours	Overtime Hours is the number of hours of paid overtime worked by the employee during the reference period	Workforce Profile Report	Yes	Overtime Hours/FTE Averaged by AER Level and category	Overtime Hours is the number of hours of paid overtime worked by the employee during the reference period
Overtime Hourly Rate	Overtime Earnings/Overtime Hours	Workforce Profile Report	Yes	The Overtime Hourly Rate was calculated by dividing the Total	Overtime Earnings/Overtime Hours Calculate average by AER level and category

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
	Calculate average by AER level and category			Overtime Earnings by the Overtime Hours.	
Total Labour Costs	Total labour costs were extracted from financial records, based on total expenditures, in line with information for RIN 2.1 Expenditure Summary and Reconciliation, 2.10 Overheads and 2.12 Input Tables. Please also refer to the BoP of these RINs. Prescribed Opex Labour is equal to the Labour component of EB RIN 3.2 Opex. EB RIN 3.2 Opex labour costs are translated into CA RIN 2.11 Labour categories as follows: Direct Network: - TOPEX0101A Lines & Cables - TOPEX0102A Substations - TOPEX0103A Communications - TOPEX0104A Secondary	TransGrid financial records reported from Ellipse and Business Reporting.	Yes	Total labour costs were extracted from the general ledger records, based on total expenditures, in line with information for RIN 2.1 Expenditure Summary and Reconciliation, 2.10 Overheads and 2.12 Input Tables. Please also refer to the BoP of these RINs.	The split of total labour costs into individual sub-categories for each cell was based on the ASLs split between the different categories. The categories are based on the RC and AC classifications consistent with the opex and capex model. As ASLs are estimates, the individual cells are estimates. The total labour expenditure under 2.11.1 (being the sum total of the different sub-categories) is actual. It is derived from the general ledger records.

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
	Systems - TOPEX0105A Land & Easements Network Overhead - TOPEX0106A MS&AM - TOPEX0107A Operations/Control Room - TOPEX0108A Grid Planning Corporate Overhead - TOPEX0109A Insurance - TOPEX0110A Rates & Taxes - TOPEX0111A Property Mgmt. - TOPEX0112A Environmental - TOPEX0113A Corporate Governance - TOPEX0114A Customer Relations - TOPEX0115A Regulatory - TOPEX0116A Finance				

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
	- TOPEX0117A IT - TOPEX0118A HR & Payroll - TOPEX0119A Self Insurance Prescribed Capex Labour is equal to Prescribed capex labour in the Ellipse General Ledger based on Portfolio Grouping. Portfolio Grouping costs are then re-categorised into CA RIN Labour template categories as follows: - *Network Overhead* - "Asset Renewal Strategies & Major Projects" - *Corporate Overhead* – "Support Facilities & Buildings" and "Support IT"				

Note to Labour Classification Levels

To align TransGrid's staff classifications to the required AER template classifications the following assumptions were made:

- Executive: Positions at an EGM/GM level.
- Senior Manager: Positions that have 'Reporting level' as a Group Manager.

- Manager: Positions that have 'Reporting Level' as Branch Manager, Team Leader or Business Manager – unless Field Services Team Leaders. Field Service Team Leaders are to be classified into Direct Labour Skilled Electrical workers rather than network overheads as their roles supervise electrical workers in the field and contribute directly to work undertaken in the field.
- Professional: Positions that are not team leaders or managers but are SP28 or higher or IEAs or SCOs.
- Semi Professional: Positions that are SP16-SP27 and that are not administrative or business support positions.
- Support Staff: Positions that are admin/support roles SP12-SP20.
- Interns, Junior Staff and Apprentices - Graduates, MD scholars, Industrial Work Experience and Trainee Engineering Officers.
- Apprentices – Electrical and line worker Apprentices.
- Skilled Electrical Worker - Positions in FS that require electrical/trans line apprenticeship to have been completed.
- Skilled Non Electrical Workers - Positions that specify a trade other than electrical/trans line apprenticeship to have been completed.
- Unskilled Workers - Positions that have a staff classification in Ellipse as Power Worker.

Note on Definition of ' Ov er he ads '

TransGrid notes that the AER's definition of 'Overheads' and 'Direct' labour that is required for the population of this template differs to that used in the normal course of business. In particular TransGrid highlights that a significant proportion of labour costs described as 'Network Overheads' relates directly to project work that would ultimately be capitalised.

Note on Definition of AER Levels

AER levels were determined by both the Business Unit the employee belonged to and by their AER Category as follows:

Exclude:
Telecommunications
Business Growth and Revenue/Non-Regulated Proposals & Revenue
Business Growth and Revenue/Customer Engagement
Business Growth and Revenue/Executive

Corporate Overheads Internal Labour Costs:

Consists of the following business units/categories:

- **Business Growth & Revenue** – Only include the Prescribed Revene and Pricing team within BGR.
  - Executive manager
  - Intern, Junior Staff, Apprentice
  - Manager
  - Professional
  - Semi professional
  - Senior manager
  - Support staff

- **People, Strategy & Stakeholders**
    - Executive manager
    - Intern, Junior Staff, Apprentice
    - Manager
    - Professional
    - Semi professional
    - Senior manager
    - Support staff
- **Finance & Support Services**
    - Executive manager
    - Intern, Junior Staff, Apprentice
    - Manager
    - Professional
    - Semi professional
    - Senior manager
    - Support staff
- **Executive**
    - Executive manager
    - Intern, Junior Staff, Apprentice
    - Manager
    - Professional
    - Semi professional
    - Senior manager
    - Support staff.

Network Overheads Internal Labour Costs:

Consists of the following business units/categories:

- **Field Services**
    - Executive manager
    - Intern, Junior Staff, Apprentice
    - Manager
    - Professional
    - Semi professional
    - Senior manager
    - Support staff
- **Project Services**
    - Executive manager
    - Intern, Junior Staff, Apprentice
    - Manager
    - Professional
    - Semi professional
    - Senior manager
    - Support staff
- **Asset Management**

- Executive manager
- Intern, Junior Staff, Apprentice
- Manager
- Professional
- Semi professional
- Senior manager
- Support staff.

Total Direct Network Labour:

Consists of the following business units/categories:

- **Field Services**
  - Apprentice
  - Skilled electrical worker
  - Skilled non electrical worker
  - Unskilled worker.

Approved by: Boon Thiow, Group Financial Controller (2.11.1- Total labour costs)

Approved by: Robyn Smith, Manager/People and Culture (all other)

7.3.10 Worksheet 2.12 Input Tables

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
General	Refer to overall principles under notes	N/A	N/A	N/A	N/A
Vegetation Management	GL Account Extract and using TransGrid financial records, which are the basis for 2015-16 Regulatory Accounts. Regulatory accounts: ▪ 2015-16 – Vegetation Management plus Routine Maintenance plus Non Routine Maintenance (RIN) equals Network Maintenance (Regulatory Accounts DISAGG Inc and Dissag Opex)	- Regulatory accounts - RIN 2.7 Vegetation Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element. Vegetation management is "Land & Easement" in the Regulatory Opex Model categories less Access Track Maintenance expenditure. The reported amount is split into the subcategories in RIN 2.7	No	N/A	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
Routine Maintenance	GL Account Extract and using TransGrid financial records, which are the basis for 2015-16 Regulatory Accounts. Regulatory accounts: ▪ 2015-16 – Vegetation Management plus Routine Maintenance plus Non Routine Maintenance (RIN 2.12) equals Network Maintenance (Regulatory Accounts DISAGG Inc and Dissag Opex).	- Regulatory accounts Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element. Routine maintenance is "Routine- Lines & Cables, Substations, Communications, Secondary Systems" in the Regulatory Opex category.	Yes	Expenditure is allocated to the categories based on proportions calculated from 'RIN 2.8 Maintenance' to the costs items of routine maintenance.	Routine maintenance presented in this schedule is populated based on the chart of accounts data extracted from the general ledger. The financial information is presented consistent with the basis of preparation in the regulatory accounts and Economic Benchmarking schedule 3.2. For purposes of developing schedule 2.12 the activity centres within the chart of accounts define the nature of maintenance expenditure as routine or non-routine. For purposes of schedule 2.8 maintenance expenditure is developed based on the work order ledger and associated coding of the nature of the work. The work order ledger is utilised to provide the detailed asset breakdown required for schedule 2.8. At times the work order coding may not correlate to the activity centre and result in a difference between the split of routine and non-routine maintenance. During 2015/16 there is an immaterial difference between schedule 2.8 and 2.12 due to this misalignment, however the total maintenance expenditure is in line across all reporting schedules.
Non-routine Maintenance	GL Account Extract and using TransGrid financial records, which are the basis for 2015-16 Regulatory Accounts Regulatory accounts: ▪ 2015-16 – Vegetation Management plus	- Regulatory accounts Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element. Non-routine maintenance "Defects and Major Operating Projects - Lines, Substations, Communications, Secondary Systems" in the Regulatory Opex Model categories plus	No	N/A	Routine maintenance presented in this schedule is populated based on the chart of accounts data extracted from the general ledger. The financial information is presented consistent with the basis of preparation in the regulatory accounts and Economic Benchmarking schedule 3.2. For purposes of developing schedule 2.12 the activity centres within the chart of accounts define the nature

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
	Routine Maintenance plus Non Routine Maintenance (RIN 2.12) equals Network Maintenance (Regulatory Accounts DISAGG Inc and Dissag Opex).	Access Track Maintenance expenditure.			of maintenance expenditure as routine or non-routine. For purposes of schedule 2.8maintenance expenditure is developed based on the work order ledger and associated coding of the nature of the work. The work order ledger is utilised to provide the detailed asset breakdown required for schedule 2.8. At times the work order coding may not correlate to the activity centre and result in a difference between the split of routine and non-routine maintenance. During 2015/16 there is an immaterial difference between schedule 2.8 and 2.12 due to this misalignment, however the total maintenance expenditure is in line across all reporting schedules.
Overheads	A GL Account Extract which are the basis for 2015-16 Regulatory Accounts. Regulatory accounts: • 2015-16 - Prescribed opex component of overheads (RIN) equals Network Operations plus Other Controllable Costs plus Self Insurance (DISAGG Inc and DISAGG Opex).	GL Account Extract which are the basis for 2015-16 Regulatory Accounts. Regulatory accounts: • 2015-16 - Prescribed opex component of overheads (RIN) equals Network Operations plus Other Controllable Costs plus Self Insurance (DISAGG Inc and DISAGG Opex) RIN 2.10 Overheads Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element. Overhead costs are as per the overhead categories in the Regulatory Opex, with	No	N/A	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
		capitalised overhead added back.			
Augmentation	As per AER instruction	Extract 2015-16 financial data from Finance Cube, which are the basis for 2015-16 Regulatory Accounts. RIN 2.3 Augex Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element.	No	N/A	N/A
Connections	As per AER instruction	Extract 2015-16 financial data from Finance Cube, which are the basis for 2015-16 Regulatory Accounts. RIN 2.5 Connections Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element.	No	N/A	N/A
Replacement	As per AER instruction	Extract 2015-16 financial data from Finance Cube, which are the basis for 2015-16 Regulatory Accounts.	Yes	N/A	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
		RIN 2.2 Replacements Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element. Contract expenditure excludes related party transactions for the period 16th December 2015 to 30 June 2016 consistent with the related party transactions reported within the regulatory accounts for capital expenditure. Related party expenditure by asset are based on work carried out by the contractor for the period 16 December to 30 June 2016.			
Non-network	This variable includes only non-network capital expenditure in line with schedule 2.6. Non-Network operating expenditure is included within overheads variable for this schedule.	Extract 2015-16 financial data from Finance Cube, which are the basis for 2015-16 Regulatory Accounts. RIN 2.6 Non Network Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element.	No	N/A	N/A

Notes: Overall principle

Finance Cube is the primary source of data, with reference made also to CAM model, for information submitted to AER previously.

Approved by: Boon Thiow, Group Financial Controller

7.3.11 Worksheet 5.2 Asset Age Profile

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
[A] GENERAL	Only those assets that were categorised 'IS' (acronym for 'In Service') were included. Scrapped, spare units not installed and non-prescribed assets were excluded for this review. TransGrid has interpreted the requirement for "INSTALLED ASSETS -> QUANTITY CURRENTLY IN COMMISSION BY YEAR" as a requirement to identify the numbers of equipment items installed in each year, from the population of equipment current in commission. This will allow a population profile to be established.	Last Financial Year's RIN submission *Ellipse Database :* Component Register Summary Report TRB601 Equipment Register Tracing Data *TransGrid System Drawings:* High Voltage Operating Diagrams (HVOD's) and WMS Scoping Diagrams	No This variable was calculated based on compiled data from Ellipse TRB 601 report. It was cross checked (spot checks) using HVOD's and WMS Scoping diagrams.	In preparation for the compilation of RIN data an Ellipse report was run at the end of June to obtain a 'snapshot' of equipment data at that time. Population profiles were based on these reports. Transformer population data was obtained separately for the Economic RIN and this information was re-used. Spot checks were done to correct a small number of errors. This included correction of voltage data based on HV operating diagrams. GIS equipment rows were identified for separate reporting and were counted manually.	Date extracted from Ellipse database was correct. Tracing information were correct. HVOD's and WMS scoping diagrams were correct. Only their latest versions were used as required.
[B] SUBSTATION SWITCHBAYS {Air Insulated Circuit Breaker}	All CBs other than GIS CBs were included under this category.	As for [A] above.	No As for [A] above.	As for [A] above.	As for [A] above.
[B] SUBSTATION SWITCHBAYS {Air Insulated Isolators/Earth Switch}	As for [A] above.	As for [A] above.	No As for [A] above.	As for [A] above.	As for [A] 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] SUBSTATION SWITCHBAYS {Current Transformers}	As for [A] above.	As for [A] above.	No As for [A] above.	As for [A] above.	As for [A] above.
[B] SUBSTATION SWITCHBAYS {GIS Module}	The term 'module' in GIS module was interpreted as a bay that typically comprised a circuit breaker, isolator(s), earth switch(es), CT(s) and a VT in GIS switchboard. A module was assumed to be identical to an outage group as shown in WMS scoping diagrams.	*TransGrid System Drawings:* High Voltage Operating Diagrams (HVOD's) and WMS Scoping Diagrams.	No	As there are very few substations with GIS, the process was predominantly manual. Most recent version of the HVOD's were printed and each bay was manually identified. GIS at Rookwood subs was added in this update.	HVOD's and WMS scoping diagrams were correct. Only their latest versions were used as required.
[C] SUBSTATION POWER TRANSFORMERS	As for [A] above.	The Excel file '2015TransFormerWorkSheet' which is based on the Ellipse TRB 601 report, system operation diagrams and manufacturer's data.	No This spreadsheet has also been used to provide Economic Benchmarking RIN data.	As for [A] above. For consistency, the Excel file '2015TransFormerWorkSheet' used previously for Economic Benchmarking RIN, was reused for Substation Power Transformers.	As explained in the BoP – Transformer Capacity parts 6.1.5 and 6.1.6.
[D] SUBSTATION REACTIVE PLANT {Capacitors}	Assets used to provide voltage support were included under this Asset Group. Tertiary Earthing Capacitors (TEC) used for protection purposes were	As for [A] above.	No As for [A] above.	As for [A] above.	As for [A] 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
	excluded.				
[D] SUBSTATION REACTIVE PLANT {Reactors}	Fault current limiting reactors on feeders, and on transformer neutrals were excluded. Two major oil filled series reactors at Sydney South Substation have been included.	As for [A] above.	N As for [A] above.	As for [A] above. Furthermore, one additional row under Asset Category/Reactors was added. This was: - >66kV & <= 132kV Gas Insulated Reactors. TransGrid has air cored shunt reactors connected to the tertiary windings of 500kV power transformers; series air cored reactors connected to a few 132kV feeders, and in series with transformers at Rookwood substation and SF6 filled shunt reactors at Haymarket Substation. All of these reactors are composed of single phase units and each unit is counted separately.	As for [A] above.
Asset Age Profile Transmission Towers by Highest Operating Voltage; Circuit Configuration Installed Assets - Quantity currently in commission by year	Quantity of transmission structures in service as at 30/6/16 categorised by construction date.	TAMIS – structure report.	Yes The age of structures and conductors is estimated based on various sources, mainly for the older lines where construction data is not well recorded.	TransGrid's TAMIS system records the construction date of all structures on the TransGrid system, This data was extracted and categorised according to voltage and circuit configuration.	Some minor project data is not included. Construction years for older lines generally comes from dates of easement plan registrations, line schedule or route plan dates. TAMIS records the construction date of structures. In some cases accurate construction dates may not be available due to small defect replacements not being tracked accurately Data is stored as "build year". Dates are stored on a calendar year basis, not financial year. For the purposes of this RIN it was

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
					assumed build year was equal to the commissioning financial year. The age profile is based on operating voltage. For example, if a structure is built for 330kV operation but only carrying line(s) operating at 132kV, it will be categorised as a 132kV structure. Note there are a small number of multiple circuit structures which have mixed voltages. In this case the structure will be classified as the maximum operating voltage of all the circuits. Note: There will be mismatch between section 2.2 as those structures as listed by project close out. The structures themselves are sometimes installed in previous financial years. Non regulated projects (such as customer connections) are not included in section 2.2 but can add to the structure count. The Privatisation process resulted in the transfer of ownership and confirmation of ownership of a small number of structures and lines. This has resulted in some changes in profile compared to the previous RIN. For example, TransGrid now owns a small amount of 66kV lines.

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
Asset Age Profile Transmission Tower Support Structures by Highest Operating Voltage; Circuit Configuration	Quantity of transmission tower support structures as at 30/6/16 categorised by construction date	N/A	No	TransGrid do not separate asset data for support structures from towers themselves	There have been some past projects to replace wooden cross arms separate to wood poles, and some insulator replacement projects, however these are not significant in the scheme of separation of these from the tower structures themselves.
Asset Age Profile Conductors by Highest Operating Voltage; Maximum Continuous Rating Installed Assets - Quantity currently in commission by year	Length of transmission conductors in service as at 30/6/16 categorised by construction date.	TAMIS – span report.	Yes The age of structures and conductors is estimated based on various sources, mainly for the older lines where construction data is not well recorded.	This data has been extracted and categorised according to the voltage and rating (winter night rating). The same rating table for EB RIN was used. Where it was noted that a circuit was constrained by terminal equipment the rating of the line component was checked manually and appropriately categorised.	The age profile has been calculated using circuit lengths not route length. Also segments of Transmission Lines that are built as split phase will have the length of that segment counted twice (as it has double the amount of conductor). Dates are stored on a calendar year basis, not financial year. For the purposes of this RIN it was assumed build year was equal to the commissioning financial year. No account has been made for any sections of conductors replaced for defects or failures. The age profile is based on operating voltage. For example, if a line is built for 330kV operation but only operating at 132kV, it will be categorised as a 132kV line. Whilst the ratings have been corrected removing terminal constraints, where a line uses

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
					multiple types of conductors the most constraining rating was assumed for the whole length. Note that as part of connection agreement revisions TransGrid took ownership of some 66kV and 132kV with field coupling points. These circuits are predominately strung on 132kV and 330kV respectively multiple circuit structures.
Asset Age Profile Transmission Cables by Highest Operating Voltage; Insulation Type Installed Assets - Quantity currently in commission by year	Length of transmission cables in service as at 30/6/16 categorised by construction date.	Electrical Data Book Project Records (EDMS) Ellipse fitment information	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. The commissioning date of these cables comes from Ellipse bay fitmits.	For small cable sections exact lengths may not have been recorded and have been estimated from available project data. The age profile is based on operating voltage. For example, if a cable is built for 330kV operation but only operating at 132kV, it will be categorised as a 132kV cable. Small lengths of high voltage cables <=66kV which may exist around / within high voltage substations have not been considered.
Asset Age Profile Transmission Towers by Highest Operating Voltage; Circuit Configuration Economic Life [Years] Mean and Standard Deviation Asset Age Profile	Average and Standard Deviation of Economic Life of each asset type.	TransGrid's 30 Year Asset Management Plan.	Yes Averages are based on number of items in the population rather than by length of conductor. No for transmission	For each structure or span, an analysis is made whether it is a coastal or inland structure, then the nominal Economic Life for that type of structure and location is averaged by voltage. For conductors, the economic life for conductors in that location is used. All TransGrid cables have a 40 year economic life.	

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
Conductors by Highest Operating Voltage; Maximum Continuous Rating Economic Life [Years] Mean and Standard Deviation Asset Age Profile Transmission Cables by Highest Operating Voltage; Insulation Type Economic Life [Years] Mean and Standard Deviation			assets.	The standard deviation of this mean is taken, rather than a comparison of replacement life with the economic life. Replacement life is not recorded specifically for each wood pole replaced, so this data is not available. There is only a single type of 220kV line, and a single economic life for cables, so there is no standard deviation for these assets.	
Economic Life – Mean Substation Categories	Expected Service Life of the asset.	Substations Asset Renewal and Maintenance Strategy.	Yes	The value is taken from the Substations Asset Renewal and Maintenance Strategy.	Based on assumptions for serviceable life based on organisational experience.
Economic Life – Standard Deviation Substation categories	Standard deviation from economic life for each asset category.	TransGrid only has economic life (mean) related numbers to refer to in calculating this figure.	Yes	The value has been calculated as square root of stated economic life for each subs-category (each row calculated separately).	The value calculated is a proxy as per AER's guidelines "Final RIN for Category Analysis Data" for the CA RIN w.r.t. standard deviations.
Protection Systems	The Number of Major Protection Relays on the Network	Equipment Register in Ellipse	No	Complete population of primary relays has been extracted from Ellipse system and was created primarily from PRIM RTI information (WAE). Sydney West relay information was based on commissioning dates supplied by the construction manager in email format as the project is still in progress. Only commissioned and in service relays have been updated.	Assumed that records are up to date.

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
Control Systems	The Number of Control IEDs on the Network	Equipment Register in Ellipse	Yes	A significant population of system assets have estimated ages. These were estimated by extrapolating the installation year from the installation of equivalent assets at the same site.	Where only a year was recorded for installation date – it is assumed this date is the end of the financial year. As recorded years have a proposed economic life of 15 years, this has been used throughout (e.g. if replacement year proposed is 2025 then assumed install date is 30/06/2010). BFS, BFN, BFW, GUR, HYM, WDL, YSN taken as commissioned. Where only a year was recorded for installation date – it is assumed this date is the end of the financial year. Where no year is recorded, assets are firstly assigned the same years as equivalent assets at the same site. Where this is not available, the years that a particular item was available for installation is spread evenly across all assets without a date (e.g. if Sagem assets were available for purchase between 2009 and 2015 and there are 120 units with no date, the 20 would be assigned 30/06/2009, 20 would be assigned 30/06/2010 and so on). Availability has been provided by the procurement group and again, is an estimate of available years due

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
					to inadequate record keeping historically. Numbers for 2015/16 have been adjusted to match repex numbers (section 2.2) and the difference moved to 2014/15. This is due to the limitations of the estimation methodology used.
Telecommunications Systems	The Number of Terminal Equipment, MUXs, Base Stations, PLC, VF Intertrips, and MW Assets on the Network	Equipment Register in Ellipse	Yes	A significant population of system assets have estimated ages. These were estimated by either extrapolating the installation year from alternative sources such as drawings, or spreading the population evenly amongst the years where the relay is known to have been installed.	Where only a year was recorded for installation date – it is assumed this date to be the end of the financial year. As recorded years have a proposed economic life of 15 years, this has been used throughout (e.g. if replacement year proposed is 2025 then assumed install date is 30/06/2010). Where no year is recorded, assets are firstly assigned the same years as equivalent assets at the same site. Where this is not available, the years that a particular item was available for installation is spread evenly across all assets without a date (e.g. if Sagem assets were available for purchase between 2009 and 2015 and there are 120 units with no date, the 20 would be assigned 30/06/2009, 20 would be

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
					assigned 30/06/2010 and so on). Availability has been provided by the procurement group and again, is an estimate of available years due to inadequate record keeping historically. Numbers for 2015/16 have been adjusted to match repex numbers (section 2.2) and the difference moved to 2014/15. This is due to the limitations of the estimation methodology used.
Metering Systems	The number of Meters on the System	Equipment Register in Ellipse	No	Direct Extraction from Ellipse.	Assumed that records are up to date. An additional 20 meters for SYW were added.
Economic Life – Mean -Protection Systems	Expected economic life of each system.	Network Renewal and Maintenance Strategy - Substation Automation Systems	Yes	Expected age for the systems adjusted for the different generation of systems and their prevalence on the Network.	Based on assumptions for serviceable life based on organisational experience as per strategy and weighted across installation profiles.
Economic Life – Mean -Control Systems -Telecommunications Systems -Metering Systems	Expected Economic Life of each system.	Network Renewal and Maintenance Strategy - Substation Automation Systems Network Renewal and Maintenance Strategy - Metering Systems Network Renewal and Maintenance	No	The value is obtained from the Network Renewal and Maintenance Strategy.	Based on assumptions for serviceable life based on organisational experience.

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
		Strategy - Telecommunications Terminal Equipment			
Economic Life – Standard Deviation Protection Systems Control Systems Telecommunications Systems Metering Systems	Standard deviation from economic life for each asset category.	TransGrid only has economic life (mean) to refer to in calculating this figure.	Yes	The value has been calculated as square root of stated economic life for each subs-category (each row calculated separately). The following asset subs-categories are applicable: • Protection systems • Control systems • Telecommunications systems • Metering systems.	The standard deviation has been calculated as square root of economic life of asset class as a proxy as per AER's guidelines "Final RIN for Category Analysis Data" for the CA RIN w.r.t. standard deviations. The reported number is affected by the transition to newer technologies for each asset sub-category. The newer technologies generally have a shorter economic life. As a notable number of older relays are still in existence, the standard deviation and the mean economic life are both expected to reduce over the coming years.

Approved by: Lance Wee, Manager / Asset Strategy

7.3.12 Worksheet 5.3 MD – Network Level

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
Raw Network Coincident maximum demand (MD)	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	Raw network 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 2015-16 have been considered for calculation of this variable.	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.
Date MD Occurred	Date the raw network coincident maximum demand occurred	TransGrid's TUOS billing system	No	Date on which the raw network coincident Maximum Demand occurred for the relevant FY.	Date relevant to TransGrid network, as per above for occurred over rolling half
Half hour time period MD Occurred	The half-hourly period during which the raw coincident maximum demand occurred	TransGrid's TUOS billing system	No	This pertains to half hour ended time period within which the MD occurred. As metering data is obtained over 15 minute intervals, rolling half hour average data is used (for example, average of 00:15 and 00:30 is used as the half hourly average demand at 00:30).	The maximum of summated rolling half-hourly averages in TransGrid's bulk supply points (BSPs) over rolling half hour periods on an as-delivered basis considered in identifying MD. The relevant half-hourly period is the reported number.
Winter/Summer Peaking	Determination of whether the TransGrid network peak above has occurred over summer or winter, in order to understand overall network capacity at the time of TransGrid network peak.	TransGrid's TUOS billing system	No	Determined by reference to when the MD occurred d by ref months of winter or summer. As per TransGrid Operating Manuals: • Months of winter are defined as June, July and August.	The season during which the half-hour time period MD occurred.

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
				• Months of summer are defined as December, January and February.	
Embedded Generation	Generation connected to a network (such as distributors' networks) supplied from a particular bulk supply point. The load supplied from TG's network excludes load supplied directly from other sources such as generators embedded within distribution networks. Under this RIN, TransGrid is required to provide data "as delivered by its network". Consequently, embedded generation does not contribute to the load supplied from TransGrid's network.	N/A	N/A	Data is required to be reported on an "as delivered by TransGrid's network basis". Loads supplied by embedded generation are not supplied by TransGrid's network. Consequently, thefigures provided by TransGrid have no component of load supplied from embedded generation.	N/A
Weather Corrected (10% POE) network coincident MD	Network coincident maximum demand with weather correction applied (using AEMO NEFR) to the raw maximum demand to	TransGrid's TUOS billing system AEMO NEFR 2016	Yes	$(AEMO_{10\% \ POE}/AEMO_{NSW \ RAW \ MD})$ x $TransGrid_{RAW \ MD}$ "$TransGrid_{adjusted \ BSP \ MD}$" refers to the raw adjusted MD for each BSP in the	TransGrid does not produce weather corrected maximum demands for its transmission system. AEMO is accountable for its production. The source data ($TransGrid_{RAW \ MD}$) is based on the TUOS billing system, and the weather correction from AEMO's NEFR 2016.

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
	obtain a 10% POE maximum demand.			schedule.	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.
Weather Corrected (50% POE) network coincident MD	Network coincident maximum demand with temperature correction applied (using AEMO NEFR) to the raw maximum demand to obtain a 50% POE year maximum demand.	TransGrid's TUOS billing system AEMO NEFR 2016	Yes	$(AEMO_{50\%\ POE}/AEMO_{NSW\ RAW\ MD}) \times TransGrid_{RAW\ MD}$ where: a) $TransGrid_{RAW\ MD}$ is the TransGrid raw network coincident MD b) $AEMO_{NSW\ RAW}$ is the NSW raw MD as reported by AEMO, and c) $AEMO_{10\%\ POE}$ is the 50% POE MD for the purposes of this section.	TransGrid does not produce weather corrected maximum demands for its transmission system. AEMO is accountable for its production. The source data ($TransGrid_{RAW\ MD}$) is based on the TUOS billing system, and the weather correction from AEMO's NEFR 2016. 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.

Approved by: Nalin Pahalawaththa, Manager / Power System Analysis

7.3.13 Worksheet 5.4 MD & Utilisation – Spatial

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
Connection point rating	Connection point" is interpreted capability of TransGrid's Bulk Supply Points (BSP) to supply current and future customer connections. Transmission systems can be limited by a range of factors including thermal ratings, voltage stability, transient stability and small signal (oscillatory) stability. These factors can be influenced by the magnitude and distribution of loads and generation across the network. They can also vary with time of day (day/night) and between seasons.	Operating diagrams and operating manuals. Electrical data book.	No	Summation of transformer nameplate ratings at connection point.	The connection point rating is determined as follows: • Where the bulk supply point is the "lower" voltage busbar of a substation, the summated nameplate ratings of the transformers supplying that busbar. • Where the bulk supply point is the "higher" voltage busbar of a substation, a tee connection or a switching station, the lessor of the summated normal summer day rating(s) of either: a) TransGrid's transmission line(s) connected at that point, or b) The customer's transmission line(s) connected at that point, or c) The summated nameplate ratings of the customer's transformer(s) supplied via the customer's line(s).
Raw adjusted MD (MW)	The maximum demand delivered at the bulk supply point, averaged over a rolling half hour period, adjusted for load transfers where applicable.	TransGrid's TUOS billing system DNSP	No	The demand over any rolling half-hourly period for each BSP during the relevant FY is calculated, and adjusted for load transfers where applicable. The maximum half-hourly period over the relevant FY is	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
				then taken as the adjusted raw MD.	

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
Raw adjusted MD (MVA)	Metered reactive loading data are not available at all bulk supply points. Where they are available, data have been used to calculate the actual MVA loading at the time of the relevant maximum MW loading. Where no reactive power data are available the MVA demand has been based on the system power factor.	TransGrid's TUOS billing system DNSP	Yes	MVA = sqrt(MW squared + MVAr squared)	Where metered MW and MVAr data are available they have been used to calculate the MVA loadings. Where MVAr data is not available, the MVA loadings have been based on the system power factor, and as such, the number is an estimate.
Half hour time period MD occurred	This variable has been taken to be the half hour period during which the relevant maximum demand (in MW) occurred. This is the half hour period ending at the nominated time.	TransGrid's TUOS billing system DNSP	No	This pertains to half hour ended time period within which MD occurred.	No assumptions. This is based on actual data.
Winter/Summer peaking	Determination of whether the TransGrid network peak above has occurred over summer or winter, in order to understand overall network capacity at the time of TransGrid network peak.	TransGrid's TUOS billing system DNSP	No	Determined whether the MD occurred in the months of winter or summer.	No assumptions. This is based on actual data.
Adjustments embedded generation	Generation connected to a network (such as distributors'	N/A	N/A	Data are required to be reported on and "as delivered by TransGrid's network basis".	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
	networks) supplied from a particular bulk supply point. Under this RIN, TransGrid is required to provide data "as delivered by its network". The load supplied from TG's network excludes load supplied directly from other sources such as generators embedded within distribution networks. Consequently, embedded generation does not contribute to load supplied from TransGrid's network.			Loads supplied by embedded generation are not supplied by TransGrid's network. Consequently, the figures provided by TransGrid have no component of load supplied from embedded generation.	
Weather corrected Coincident MD 10% PoE (MW)	The adjusted MD for the BSP weather corrected to produce 10% POE MD.	TransGrid's TUOS billing system AEMO Connection Point forecast 2016	Yes	($AEMO_{10\%\ POE}$/$AEMO_{NSW\ RAW\ MD}$) x $TransGrid_{adjusted\ BSP\ MD}$ Where: a) "$TransGrid_{adjusted\ BSP\ MD}$" refers to the raw adjusted MD for each BSP in the schedule b) $AEMO_{NSW\ RAW}$ is the NSW raw MD as reported by AEMO; and c) $AEMO_{10\%\ POE}$ is the 10% POE	TransGrid does not produce weather corrected maximum demands for its transmission system. AEMO is accountable for its production. The source data is based on the TUOS billing system, and the weather correction based on AEMO's 2016 Connection Point Forecast data containing raw and weather corrected actuals. 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. For industrial loads supplied directly from BSPs, weather correction is not applicable, as load is not weather

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
				MD as reported by AEMO.	dependent.
Weather corrected MD 10% PoE (MVA)	As for 'Weather corrected MD 10% PoE (MW)	TransGrid's TUOS billing system AEMO Connection Point forecasts 2016.	Yes	Where both MW and MVAr data are available, MVA were calculated based on those data. Where MVAr data are not available, the "system average" power factor has been used.	As for 'Weather corrected MD 10% PoE (MW)'. In addition, where metered MW and MVAr data are available they have been used to calculate the MVA loadings. Where MVAr data is not available, the MVA loadings have been based on the system power factor; as such, the number is an estimate.
Weather corrected Coincident MD 50% PoE (MW)	As for 'Weather corrected MD 10% PoE (MW)'	As for 'Weather corrected MD 10% PoE (MW)'	Yes	As for 'Weather corrected MD 10% PoE (MW)'.	As for 'Weather corrected MD 10% PoE (MW)'.
Weather corrected MD 50% PoE (MVA)	As for 'Weather corrected MD 10% PoE (MVA)'	As for 'Weather corrected MD 10% PoE (MVA)'	Yes	As for 'Weather corrected MD 10% PoE (MVA)'.	As for 'Weather corrected MD 10% PoE (MVA)'.

Approved by: Nalin Pahalawaththa, Manager/ Power System Analysis