TransGrid

Economic Benchmarking RIN Response - Basis of Preparation

31 OCTOBER 2014

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1. Introduction

On 19 December 2013, 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 'Economic Benchmarking RIN'), requiring the business to prepare and submit certain information to support the AER's Economic Benchmarking activities. This Basis of Preparation document has been prepared to support the audited information package which is due to be submitted to the AER by 31 October 2014. 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. Audit Report
5. Verification of the information by way of a Statutory Declaration in the form provided as Appendix C to the RIN.

2. Compliance with the Economic Benchmarking RIN Requirements

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

a) demonstrate how the information provided is consistent with the requirements of this Notice;
b) explain the source from which TransGrid obtained the information provided
c) explain the methodology TransGrid applied to provide the required information, including any assumptions TransGrid made;
d) explain, in circumstances where TransGrid cannot provide input for a Variable using Actual Information and therefore must provide input using Estimated Information:
    1) why an estimate was required, including why it was not possible for TransGrid to use Actual Financial Information or Actual Non-financial Information (as the case may be, depending on the variable.
    2) 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 this Notice.

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

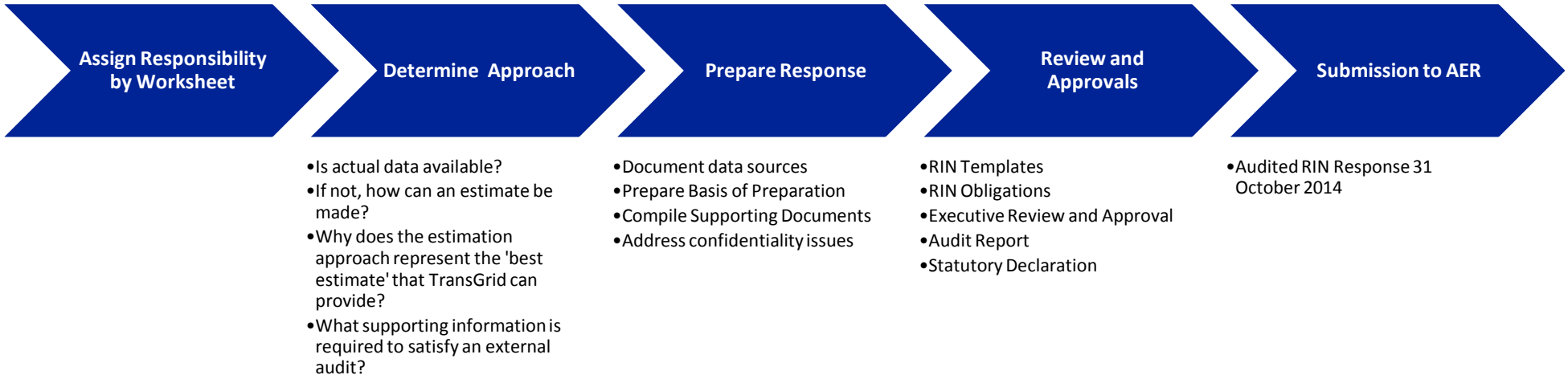
Economic Benchmarking RIN Response - Basis of Preparation

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)***

[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. Preparation Process

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



3.1 Document Control

The RIN, Worksheets, Basis of Preparation 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 and reviewed by their Group Manager prior to the consolidation into TransGrid's draft submission package. The draft submission package has then submitted to KPMG audit and subject to an external audit during September and October 2014. The final RIN package will be provided by 31 October 2014, inclusive of the Final Audit Report and signed Statutory Declaration.

4. Principles of Preparation

TransGrid's response to the Economic Benchmarking RIN has been prepared in accordance with the AER's document *Economic Benchmarking RIN for transmission network service providers, Instructions and Definitions, TransGrid (ABN 19 622 755 774)*, provided as Appendix B to the Economic Benchmarking RIN.

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. In cases 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 judgment or assumption that has been made.
- Where actual information exists, but the information is incomplete over the historical period covered by the Economic Benchmarking 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, with the exception of the treatment of provisions in the RIN schedule 3.2.3 Provisions. TransGrid has completed schedule 3.2.3 Provisions in accordance with the requirements of the RIN schedules and notes that this is inconsistent with the relevant Accounting Standard. To the extent determined appropriate, the RIN schedules have been prepared in compliance with the disclosure requirements of the relevant Accounting Standards. TransGrid also notes that there has been a change to AASB 119 Employee Benefits which has impacted the expense recognised in relation to Defined Benefits.

5. Information Sources

Due to the combination of financial and non-financial data requested by the AER, including a number of variables that are not routinely reported, TransGrid has drawn data from a 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 variables that are required in the RIN response.

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

Information Source	Brief Description	Supports
AEMO Price and Demand Data Files	AEMO Price and Demand Data Files are publicly available historical records of National Electricity Market spot price and demand for each trading interval.	**Worksheet 3.5 Physical Assets**

Information Source	Brief Description	Supports
AEMO Settlement Statements	AEMO issued statements for intraregional and interregional settlement residues.	**Worksheet 3.1 Revenue**
AER Current Period Determination	The AER's final determination for the 2009/10 to 2013/14. Outlining the Efficiency Carry Forward revenue from the prior regulatory control period	**Worksheet 3.1 Revenue, Worksheet 3.3 Assets (RAB)**
AER Roll Forward Model	TransGrid's populated Roll Forward Models provided to the AER	**Worksheet 3.3 Assets (RAB)**
AER STPIS Letters	Annual letters from the AER confirming the revenue attributable to the Service Target Performance Incentive Scheme	**Worksheet 3.1 Revenue**
Bureau of Meteorology (BOM)	List and location of weather stations in NSW	**Worksheet 3.7 Operating Environment, Worksheet 3.7.4 Weather Stations**
Bush Fire Prone Lands	Spatial data set sourced from NSW Rural Fire Service	**Worksheet 3.7 Operating Environment**
Climate Zone Map	Spatial data set sourced from the Australian Bureau of Meteorology	**Worksheet 3.7 Operating Environment**
Ellipse	TransGrid's corporate asset management database	**Worksheet 3.5 Physical Assets, Worksheet 3.7 Operating Environment**
Invoices Received	Contractor invoices received for vegetation management works have been used to estimate the variables requested in Worksheet 8	**Worksheet 3.7 Operating Environment**
LAN	TransGrid's corporate IT network	Various (Document Locations)
LiDAR	Light Detection and Ranging data sourced from aerial surveys that is used to measure vegetation clearances from TransGrid's transmission line assets.	**Worksheet 3.7 Operating Environment**
Spot Height Data (25m)	Topographical information sourced from NSW Land and Property Information.	**Worksheet 3.7.4 Weather Stations**
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	**Worksheet 3.5 Physical Assets**
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.	**Worksheet 3.5 Physical Assets, Worksheet 8 Operating Environment, Worksheet 3.7.4 Weather Stations**
TransGrid Regulatory Accounts	TransGrid's annual Regulatory Accounts which are prepared and submitted in accordance with the AER's requirements.	**Worksheet 3.2 Opex, Worksheet 3.2.3 Provisions**
TransGrid Electrical Data Book	A central record of electrical asset data regarding TransGrid's network that is published on the TransGrid Intranet.	**Worksheet 3.5 Physical Assets** **Worksheet 3.7 Operating Environment**
TransGrid Operating Manuals	Operating Manuals for TransGrid's assets outlining ratings for assets in each region of TransGrid's network.	**Worksheet 3.5 Physical Assets**
TRIM	TransGrid's corporate document management system	Various (Document Locations)
TUOS System	Transmission Use of System (TUOS) charges are TransGrid's primary source of revenue.	**Worksheet 3.1 Revenue** **Worksheet 3.4 Operational Data**

Information Source	Brief Description	Supports
	The TUOS System is the billing system that underpins TransGrid's invoicing and records the information from the various metering installations deployed across TransGrid's network.	**Worksheet 3.7 Operating Environment**
The Wire	TransGrid's Intranet	Various (Document Locations)
TransGrid Manuals & Policies	Used for the operation and maintenance of TransGrid's assets, these outline equipment information, standard practices and maintenance requirements.	**Worksheet 3.5 Physical Assets** **Worksheet 3.7 Operating Environment**

6. Confidentiality Claims

TransGrid has identified one issue where measures need to be taken to protect confidential information. This is summarised below:

Variable(s) affected	Issue	TransGrid Resolution
TOPED0102	Individual customers receiving supply at 330kV and 220kV can be identified if disaggregation is provided by voltage level.	In accordance with the AER's preparation guidelines, these figures have been aggregated into the variable TOPED0102 for the Public Version of the templates.

7. Detailed Basis of Preparation

The following sections outline the Basis for Preparation for each line item in the TransGrid Economic Benchmarking RIN.

7.1 Contents Worksheet

The Contents worksheet does not contain any information inputs.

7.2 Worksheet 1.0 Business & other details

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

7.3 Worksheet 3.1 Revenue

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[2]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TREV0101 From Fixed Customer (Exit Point) Charges	Connection Exit charges for distributors & direct connect customers based on fixed daily rate	From invoices generated by the Pricing team on the monthly basis using a core business TUOS billing system. Revenue from these invoices are summarised in the TUOS Data spreadsheets to facilitate internal financial reporting.	No	Prices for all customer connection points are calculated annually as per the AER approved Pricing Methodology. Approved (prices) by the Executive General Manager/Network Planning & Performance are published on TransGrid's website by 15 May. These (prices) are entered into the TUOS billing system and invoices for all customers are generated each month using the TUOS billing system.	-
TREV0102 From Variable Customer (Exit Point) Charges	This type of charge is not applicable for TransGrid, all exit charges are on fixed basis above	-	No	-	-
TREV0103 From Fixed Generator	Connection Entry charges for generators based on	As per TREV0101	No	As per TREV0101	-

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Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[2]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
(Entry Point) Charges	fixed daily rate				
TREV0104 From Variable Generator (Entry Point) Charges	This type of charge is not applicable for TransGrid, all entry charges are on fixed basis above	-	No	-	-
TREV0105 From Fixed Energy Usage Charges (Charge per day basis)	Charges applied for customer D	As per TREV0101	No	As per TREV0101	-
TREV0106 From Variable Energy Usage charges (Charge per kWh basis)	Energy based (per kWh rate) usage charges from loads customers.	As per TREV0101	No	As per TREV0101	-
TREV0107 From Energy based Common Service and General Charges	Energy based (per kWh rate) Common Service and Non-locational TUOS (previously called General Charges) from all loads customers.	As per TREV0101	No	As per TREV0101	-

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[2]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TREV0108 From Fixed Demand based Usage Charges	Revenue from charges based on a nominated/agreed demand basis	As per TREV0101	No	As per TREV0101	-
TREV0109 From Variable Demand based Usage Charges	Demand based (per kW rate) usage charges from all loads customers.	As per TREV0101	No	As per TREV0101	-
TREV0110 Revenue from other Sources	Intra-regional residues and Inter-regional Settlement residues auction proceeds, net financial transfers per TREV0201, Incentive amount per TREV0302, net adjustments of network support pass through amounts, revenue deferral and TUOS under/over collections	From AEMO settlement statements, issued TUOS invoices, AER STPIS letters, TUOS revenue reconciliations	No	Other Revenue (TREV0205) + Revenue from Other Connected transmission Systems (TREV0201)	-
TREV0201 From Other connected transmission networks	Net of financial transfers to & from Ausgrid, Essential Energy and Directlink	As per TREV0101	No	As per TREV0101	-

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[2]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TREV0202 From Distribution networks	Total amount charged to ActewAGL, Ausgrid, Essential Energy, Endeavour Energy less financial transfers in TREV0201 excluding Directlink transfers	As per TREV0101	No	As per TREV0101	-
TREV0203 From Directly connected end–users	Total amounts charged to the three direct customers	As per TREV0101	No	As per TREV0101	-
TREV0204 From Generators	Total connection Entry charges for generators	As per TREV0101	No	As per TREV0101	-
TREV0205 Other revenue	Intra-regional residues and Inter-regional Settlement residues auction proceeds, Incentive amount per TREV0302, net adjustments of network support pass through amounts, revenue deferal and TUOS under/over collections	From AEMO settlement statements, issued TUOS invoices, AER STPIS letters, TUOS revenue reconciliations	No	AEMO email a Final Settlements report each week with the intra-regional and inter-regional settlements figures, as well as a settlement residue auctions report on a quarterly basis. These figures are compiled into the Settlement residues spreadsheet. This forms part of the monthly account reconciliation process, confirming that the data within the spreadsheet is correct.	-

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[2]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TREV0301 EBSS	AER Approved EBSS revenue	Current regulatory determination	No	-	-
TREV0302 STPIS	AER Approved STPIS revenue	Approval letter from AER	No	-	-
TREV0303 Other	Any additional AER approved revenue for 'other' incentive schemes	-	No	-	-
TREV03 Total revenue of incentive schemes	Total of TREV0301, TREV0302 and TREV0303.	-	No	TREV0301 + TREV0302 + TREV0303.	-

Approved by (Group Manager): Mal Coble, Manager Network Support, Consultation and Pricing

7.4 Worksheet 3.2 Opex

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[3]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 3.2.1 Current opex categories and cost allocations TOPEX0101 Maintenance – Lines & Cable To TOPEX0120 Network Support	As per Instruction and Definition provided	2013-14 Regulatory Accounts '2013-14 Historical Opex by Expenditure Category sheets'	N	Prepared in accordance with the requirements of the annual Regulatory Accounts.	Figures reconcile to the Regulatory accounts

Approved by (Group Manager): David Van Beek, Manager Corporate & Management Accounting

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7.5 Worksheet 3.2.3 Provisions

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[4]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPEX03A Long Services Leave	As per Instruction and Definition provided	TransGrid Financial records	N	The different types of provisions are extracted from TransGrid financial records.	-
TOPEX0301A The carrying amount at the beginning of the period To TOPEX0314A The carrying amount at the end of the period	As per Instruction and Definition provided	2013-14 Regulatory Accounts and supporting for Provisions	Y	From the Provisons supporting detailed analysis, the opening balance, closing balance and movement details for Long Services Leave are extracted.	Separation between prescribed / nonprescribed, opex / capex is based on year end oncost adjustment split.
TOPEX03B	As per Instruction and Definition	TransGrid Financial records	N	The different types of provisions are extracted from	-

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Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[4]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Annual Leave	provided			TransGrid financial records.	
TOPEX0301B The carrying amount at the beginning of the period To TOPEX0314B The carrying amount at the end of the period	As per Instruction and Definition provided	2013-14 Regulatory Accounts and supporting for Provisions	Y	From the Provisons supporting detailed analysis, the opening balance, closing balance and movement details for Annual Leave are extracted.	Separation between prescribed / nonprescribed, opex / capex is based on year end oncost adjustment split.
TOPEX03C Workers' Compensation	As per Instruction and Definition provided	TransGrid Financial records	N	The different types of provisions are extracted from TransGrid financial records.	-
TOPEX0301C The carrying amount at the beginning of the period To TOPEX0314C The carrying amount at the end of the period	As per Instruction and Definition provided	2013-14 Regulatory Accounts and supporting for Provisions	Y	From the Provisons supporting detailed analysis, the opening balance, closing balance and movement details for Insurance are extracted.	Separation between prescribed / nonprescribed, opex / capex is based on year end oncost adjustment split.

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[4]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPEX03D Defined Benefits Superannuation Schemes	As per Instruction and Definition provided	TransGrid Financial records	N	The different types of provisions are extracted from TransGrid financial records.	-
TOPEX0301D The carrying amount at the beginning of the period To TOPEX0314D The carrying amount at the end of the period	As per Instruction and Definition provided	2013-14 Regulatory Accounts	Y	From the 2013-14 Regulatory Accounts, the opening balance, closing balance and movement details for Superannuation are extracted.	As at 30.6.2014, 50% of TransGrid's EISS members are in-service and 50% are out of service. The out of service members are considered to be wholly prescribed as there is no meaningful way to allocate them the non prescribed work business streams. Allocating the remaining 50% of the defined benefit super movements and balance to prescribed and non prescribed business streams results in an immaterial allocation to non prescribed. As out of service members will continue to grow as more members retire, any allocation of defined benefit super to non prescribed business streams will continue to reduce. In TransGrid's Statement of Profit or Loss and Other Comprehensive Income for 30/6/2014, Expenses excluding Finance Costs were restated upward by $17.381M in the comparative figure for the preceding year. This was a result of the adoption of the revised AASB 119: Employee Benefits Accounting standard. This restatement has not been reflected in prior RIN submissions.

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[4]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TOPEX03E Short Term Incentives	As per Instruction and Definition provided	TransGrid Financial records	N	The different types of provisions are extracted from TransGrid financial records.	
TOPEX0301E The carrying amount at the beginning of the period To TOPEX0314E The carrying amount at the end of the period	As per Instruction and Definition provided	2013-14 Regulatory Accounts and supporting for Provisions	Y	From the Provisons supporting detailed analysis, the opening balance, closing balance and movement details for Short Term Incentives are extracted.	STIS is not part of the oncost process and is wholly accounted for as an expense in the P&L against account 250 - Short Term Incentive Scheme

Approved by (Group Manager): David Van Beek, Manager Corporate & Management Accounting

7.6 Worksheet 3.3 Assets(RAB)

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[5]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TABLE 3.3.1 – REGULATORY ASSET BASE VALUES TRAB0101 Opening Value To TRAB0107 Closing value for asset value	As per Instruction and Definition provided	Electricity Transmission Network Service Provider Roll Forward Model (RFM) , with TransGrid information	N	Prepared in accordance with the requirements of the AER Determination. This is the sum of all the "Asset Category" below. "As Commissioned" RAB used.	-
TABLE 3.3.2 – ASSET VALUE ROLL FORWARD Overhead Transmission Assets TRAB0201 Opening Value	As per Instruction and Definition provided	Electricity Transmission Network Service Provider Roll Forward Model (RFM) , with TransGrid information	N	Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used. In the RFM, the categories that are noted as "Transmission Lines"	In the RFM, there are two categories in 2009-14 relating to TL and Cables: Trans Lines & Cables –

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Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[5]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
To TRAB0207 Closing value for asset value					Aug Trans Lines & Cables – Rep As "as commissioned" RAB is used, there is no cables commissioned as far in 2009-14, hence all values under TL& Cable are attributed to TL
Underground Transmission Assets TRAB0301 Opening Value To TRAB0307 Closing value for asset value	As per Instruction and Definition provided	Electricity Transmission Network Service Provider Roll Forward Model (RFM) , with TransGrid information	N	Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used In the RFM, the categories that are noted as "Underground Cables"	-
Transmission Switchyards, Substations TRAB0401 Opening Value To TRAB0407 Closing value for asset value	As per Instruction and Definition provided	Electricity Transmission Network Service Provider Roll Forward Model (RFM) , with TransGrid information	N	Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used In the RFM, the categories that are noted as "Substations including Buildings", "Substations – Augmentation". Substation – Replacement"	-

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[5]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Easements TRAB0501 Opening Value To TRAB0507 Closing value for asset value	As per Instruction and Definition provided	Electricity Transmission Network Service Provider Roll Forward Model (RFM) , with TransGrid information	N	Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used In the RFM, the categories that are noted as "Land and Easements"	-
Other Assets with Long Lives TRAB0601 Opening Value To TRAB0607 Closing value for asset value	As per Instruction and Definition provided	Electricity Transmission Network Service Provider Roll Forward Model (RFM) , with TransGrid information	N	Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used In the RFM, the categories that are noted as "SCADA and Communications", "SMHEA Assets", "Secondary Systems – Augmentation", "Secondary Systems – Replacement", "Communications – Augmentation", "Communications – Replacement", "Equity Raising Costs"	-
Other Assets with Short Lives TRAB0701 Opening Value To TRAB0707 Closing value for asset value	As per Instruction and Definition provided	Electricity Transmission Network Service Provider Roll Forward Model (RFM) , with TransGrid information	N	Prepared in accordance with the requirements of the AER Determination. "As Commissioned" RAB used In the RFM, the categories that are noted as "Non-network Assets", "Business IT", "Support the Business – Minor Plant", "Motor Vehicles & Mobile Plant"	-

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[5]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TABLE 3.3.3 – TOTAL DISAGGREGATED RAB ASSET VALUE TRAB0801 Overhead transmission assets (wires and towers/poles etc) To TRAB0806 Other assets with short lives (please specify)	As per Instruction and Definition provided	Electricity Transmission Network Service Provider Roll Forward Model (RFM) , with TransGrid information	N	This is calculated as the average of the opening and closing RAB values for the Regulatory Year for each RAB Asset Category as per Page 22 of the Instruction.	-
TABLE 3.3.4 – ASSET LIVES 4.4.1 Asset Lives – estimated service life of new assets TRAB0901 Overhead transmission assets To TRAB0905 Other assets with short lives	As per Instruction and Definition provided	Electricity Transmission Network Service Provider Roll Forward Model (RFM) , with TransGrid information	N	Calculation for Weighted Average Asset lives for each asset category, in accordance with Page 22 of the Instruction. Calculation Sheet attached.	-
4.4.2 Asset Lives – estimated residual service life TRAB1001 Overhead transmission assets	As per Instruction and Definition provided	Electricity Transmission Network Service Provider Roll Forward Model (RFM) , with TransGrid information	No, actual information	This is calculated using Opening Asset Value divided by depreciation for the year.	As depreciation is already weighted averaged, the residual service life is considered weighted averaged.

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[5]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
To TRAB1005 Other assets with short lives					

Approved by (Group Manager): David Van Beek, Manager Corporate & Management Accounting

7.7 Worksheet 3.4 Operational Data

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 3.4.1 Energy Delivery Energy Grouping by Downstream Connection Type TOPED0101 To other connected transmission networks	Energy supplied to transmission networks in adjacent NEM regions (i.e. flows related to interconnectors). In accordance with the first paragraph of the AER's instructions (5.1 Instructions on page 24) only exports have been considered (as these are flows being delivered by TransGrid's network) Flows to other	TransGrid's TUOS billing system	Yes The data are materially dependent on whether this category includes the parts of DNSPs' networks which serve a transmission function and are designated as transmission assets for pricing purposes. Actual information has been used, excluding DNSP assets that serve a transmission function from the calculation.	Data have been obtained from revenue or statistical 15 minute metering registrations. For each of the categories, those 15 minute data have been summated to obtain figures for each regulatory (financial) year Energy calculations involve spreadsheets which sum the 15 minute registrations for the relevant period(s) and make any adjustments to achieve the appropriate units of measurement (for example, dividing by 1,000 to convert from kWh to MWh) Energy flow to other TNSPs was found by summing up interconnector exports from TransGrid's network. These are at Jindera-Wodonga, Buronga Red Cliffs, and Murray –Dederang to Victoria and	DNSP transmission assets are not included in this calculation. Rounded to three significant figures

[6] '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".**

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[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	transmission networks have been taken to be flows to adjacent NEM Regions. Flows to other transmission networks within the NSW region of the NEM (to networks owned by DNSPs) have been included in "Flows to Distribution Networks"			QNI to Queensland.	
Table 3.4.1 Energy Delivery Energy Grouping by Downstream Connection Type TOPED0102 To distribution networks	Energy supplied to the distribution networks has been taken to be the energy supplied to the distributors in NSW and the ACT, even though parts of Ausgrid's and Essential Energy's networks are considered to serve a transmission function	TransGrid's TUOS billing system	Yes, as per TOPED0101	As per TOPED0101 This was calculated as follows; Native BSP loads minus embedded generation plus embedded generation that feed into Transgrid network. Industrials such as Tomago and Broken Hill mines are also included in this category in the Public Version, in accordance with the AER's Instructions.	As per TOPED0101

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[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 3.4.1 Energy Delivery Energy Grouping by Downstream Connection Type TOPED0103 to TOPD0112 To directly connected end-users	Energy supplied to customers directly connected via dedicated connections owned by third parties such as a DNSP (excluding customers whose identity could be deduced from the voltage of supply – Reported in TOPED0102) Aggregated data for customers supplied at 132 kV has been provided. Those aggregated energy usage data cover Visy Gadara, Norske Skog, Cadia mine and North Parkes mine.	TransGrid's TUOS billing system	Yes The data are materially dependent on whether this category includes customers indirectly connected to TransGrid's network via dedicated feeders which are owned by third parties such as DNSPs. Actual information has been used, which includes some industrial customers that are indirectly connected via the distribution network.	As per TOPED0101 This includes all industrials connected at 132 KV (ANM, Gadara, Cadia and North Parkes Mines)	Includes some industrials connected via dedicated feeders owned by DNSP's
Table 3.4.1 Energy Delivery Energy Grouping by Downstream Connection	Energy supplied to pumps and power station auxiliaries	TransGrid's TUOS billing system	No		

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[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Type TOPD0113 Pumping and power station auxiliaries					
Table 3.4.1 Energy Delivery Energy Grouping by Downstream Connection Type TOPED01 Total energy transported	The total (gross) energy delivered by TransGrid's network at the locations where it connects to other party's networks.	TransGrid's TUOS billing system	The total figure (TOPED01) is not 'Estimated Information'. However the individual components are as they depend materially on assumptions about what constitutes "other connected networks" and whether customers connected directly by assets owned by a third party are "Directly connected end-users"	Summation of metered energy delivered at the individual locations within each category. Only exports from TransGrid's network have been considered.	Other connected networks have been taken to be interconnections to adjacent states. Distribution networks have been taken to be DNSP networks, even though some parts of those networks may serve a transmission function. End-use customers directly connected via dedicated assets owned by a third party have been taken to be "Directly connected end-users".
Table 3.4.2 Connection Points TOPCP0101 to TOPCP0111 Number of entry points at each transmission voltage	This variable is interpreted as locations of connections between TransGrid's network and networks of other parties, where real	Based on AEMO TNIs, adjusted for the limitations of that measure. TNIs are not always representative of the locations at which TransGrid's network connects to other networks. For example, some locations (such as interconnectors) do not have TNIs, where other	Yes Data are dependent on assumptions such as whether a location can be both and entry and an exit	Metered data have been used to determine the direction(s) in which real power can flow at a particular location. The voltage has been taken to be the actual voltage at which the connection is made (rather than the voltage designation	The data for 2013/14 are the average of the numbers at the beginning and end of that financial year.

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[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
level	power can flow into TransGrid's network. Where real power can flow both into and out of TransGrid's network at a particular location, that location has been taken to be both an entry and an exit point. Connections at different voltages are considered to be different locations. For example, at a particular substation if power can flow into TransGrid's network at two different voltages each of those voltages constitutes a separate entry point.	locations have multiple TNIs covering connections to different parties at that location. Some TNIs have the wrong voltage designation (for example the Khancoban 11 kV connection is designated as 330 kV) and others have no connections to other parties at that voltage. Some TNIs are within other parties' networks. Those TNIs have been ignored.	point.	used by AEMO). The total number of entry (and exit) points at each voltage has been calculated by counting the number of those points operating at that voltage.	
Table 3.4.2 Connection Points TOPCP0201 to TOPCP0212 Number of exit points at each transmission voltage	This variable is interpreted as locations of connections between TransGrid's network and networks of other	As per TOPCP0101 - TOPCP0108	Yes As per TOPCP0101 - TOPCP0108	As per TOPCP0101 - TOPCP0108	As per TOPCP0101 - TOPCP0108

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[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
level	parties, where real power can flow out of TransGrid's network. Where real power can flow both into and out of TransGrid's network at a particular location, that location has been taken to be both an entry and an exit point. Connections at different voltages are considered to be different locations. For example, at a particular substation if power can flow out of TransGrid's network at two different voltages each of those voltages constitutes a separate entry point.				
Table 3.4.3 System Demand Table 3.4.3.1 Annual	As per AER definition on page 24 of Economic Benchmarking RIN	TransGrid's TUOS billing system	Yes The data are materially dependent on whether	Maximum demand calculations involve spreadsheets which calculate rolling half hour average demands, then calculate the maximum rolling half hour demand	Reported to three significant figures It has been assumed that

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[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
system maximum demand characteristics – MW measure TOPSD0101 Transmission System coincident maximum demand	For transmission network service providers.		flows to "Other connected transmission networks" is on an "as delivered" basis (in accordance with the first paragraph of the AER's instructions (5.1 Instructions on page 24) or on a "nett basis" in accordance with the second paragraph of the AER's instructions (5.1 Instructions on page 24).	over the relevant period and adjusting to the required unit of measurement. Where reactive power data are available, spreadsheets which also calculate the reactive power loads at the time of the maximum demands are also available	all components of this total are to be calculated on a consistent basis, that is on an "as delivered" basis.
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics – MW measure TOPSD0102 Transmission System coincident weather adjusted maximum demand 10% POE	As per AER definition on page 24 of Economic Benchmarking RIN For transmission network service providers.	TransGrid's TUOS billing system	Yes These are based on AEMO's weather and day-type correction models for the NSW region of the NEM The approach adopted in estimating this parameter is the best available in the circumstances.	TransGrid does not produce weather corrected maximum demands for to its transmission system. However, TransGrid has access to historical actual 10% and 50% POE (weather corrected) data for summer and winter maximum demands from the 2014 AEMO model for the NSW region of the NEM. TransGrid has worked out summer and winter relationships between AEMO's actual network maximum demands for the NSW region and TransGrid's actual maximum demands on its network. These relationships have been applied to AEMO's 10% and 50% POE historical maximum demands to obtain 10% and 50% PoE for TransGrid's network.	Assumed that the weather and day-type corrected historical series derived from AEMO weather and day-type correction models can be used to approximate weather and day-type corrected actuals for TransGrid's boundary. Reported to three significant figures

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics – MW measure TOPSD0103 Transmission System coincident weather adjusted maximum demand 50% POE	As per AER definition on page 24 of Economic Benchmarking RIN For transmission network service providers.	TransGrid's TUOS billing system	Yes These are based on AEMO's weather and day-type correction models for the NSW region of the NEM The approach adopted in estimating this parameter is the best available in the circumstances.	As for TOPSD0102	Assumed that the weather and day-type corrected historical series derived from AEMO weather and day-type correction models can be used to approximate weather and day-type corrected actuals for TransGrid's boundary. Reported to three significant figures.
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics – MW measure TOPSD0104 Transmission System non-coincident summated maximum demand	As per AER definition page 24.	TransGrid's TUOS billing system	Yes The data are materially dependent on whether flows to "Other connected transmission networks" is on an "as delivered" basis (in accordance with the first paragraph of the AER's instructions (5.1 Instructions on page 24) or on a "nett basis" in accordance with the second paragraph of the AER's instructions (5.1	These data are the summation of the local (non-coincident) maximum demands at each location where energy is supplied to other parties.	Reported to three significant figures. It has been assumed that all components of this total are to be calculated on a consistent basis, that is on an "as delivered" basis.

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[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
			Instructions on page 24).		
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics – MW measure TOPSD0105 Transmission System non-coincident weather adjusted summated maximum demand 10% POE	-	-	Yes These are based on AEMO's weather and day-type correction models for "connection points" within the NSW region of the NEM The approach adopted in estimating this parameter is the best available in the circumstances.	TG does not produce weather and day-type corrected actual maximum demands (either coincident or non-coincident) for its bulk supply points. However, information from AEMO's 2014 "connection point" forecasts for the NSW region has been used. For each bulk supply point, TransGrid's actual (non-coincident) bulk supply point maximum demands has been scaled by the ratio of AEMO's corrected (non-coincident) maximum demands to AEMO's actual (non-coincident) maximum demand. For other locations, such as industrial loads, interconnectors, pumps and power station auxiliaries, for which meaningful correction models cannot be developed (as those loads are not necessarily weather or day-type dependent), actual maximum demands have been used The corrected (non-coincident) maximum demands for all bulk supply points and other locations were then	- It has been assumed that all components of this total are to be calculated on a consistent basis, that is on an "as delivered" basis. Reported to three significant figures.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
				summed.	
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics – MW measure TOPSD0106 Transmission System non-coincident weather adjusted summated maximum demand 50% POE	-	-	Yes These are based on AEMO's weather and day-type correction models for "connection points" within the NSW region of the NEM The approach adopted in estimating this parameter is the best available in the circumstances.	As per TOPSD0105	- It has been assumed that all components of this total are to be calculated on a consistent basis, that is on an "as delivered" basis. Reported to three significant figures.
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics – MVA measure TOPSD0201 Transmission System coincident maximum demand	As per AER definition page 24.	Variables: TOPSD0101 TOPSD0301	Yes The data are materially dependent on how the data in MW are "translated" to data in MVA The approach adopted in estimating this parameter is the best available in the circumstances. Refer to note below	Divide Transmission System Coincident Maximum Demand (TOPSD0101) by Average Overall Network Power Factor Conversion between MVA and MW (TOPSD0301).	Accuracy is limited by the uncertainty inherent in the calculation of the average power factor.

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[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics – MVA measure TOPSD0202 Transmission System coincident weather adjusted maximum demand 10% POE	-	- Variables: TOPSD0102 TOPSD0301	Yes The data are materially dependent on how the data in MW are "translated" to data in MVA The approach adopted in estimating this parameter is the best available in the circumstances. Refer to note below	Divide Transmission System Coincident Maximum Demand 10%POE(TOPSD0102) by Average Overall Network Power Factor Conversion between MVA and MW (TOPSD0301	Accuracy is limited by the uncertainty inherent in the calculation of the average power factor.
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics – MVA measure TOPSD0203 Transmission System coincident weather adjusted maximum demand 50% POE	-	- Variables: TOPSD0103 TOPSD0301	Yes The data are materially dependent on how the data in MW are "translated" to data in MVA The approach adopted in estimating this parameter is the best available in the circumstances. Refer to note below	Divide Transmission System Coincident Maximum Demand 50% POE (TOPSD0103) by Average Overall Network Power Factor Conversion between MVA and MW (TOPSD0301	Accuracy is limited by the uncertainty inherent in the calculation of the average power factor.
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics	As per AER definition page 24.	Variables: TOPSD0104 TOPSD0301	Yes The data are materially dependent on how the data in MW are "translated" to	Divide Transmission System non-coincident weather summated maximum demand (TOPSD0104) by Average Overall Network Power Factor Conversion between MVA and MW	Accuracy is limited by the uncertainty inherent in the calculation of the average power factor.

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[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
– MVA measure TOPSD0204 Transmission System non-coincident summated maximum demand			data in MVA The approach adopted in estimating this parameter is the best available in the circumstances. Refer to note below	TOPSD0301.	
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics – MVA measure TOPSD0205 Transmission System non-coincident weather adjusted summated maximum demand 10% POE	-	-	Yes The data are materially dependent on how the data in MW are "translated" to data in MVA The approach adopted in estimating this parameter is the best available in the circumstances. Refer to note below	Divide Transmission System non-coincident weather adjusted summated maximum demand 10% PoE (TOPSD0105) by Average Overall Network Power Factor Conversion between MVA and MW TOPSD0301.	Accuracy is limited by the uncertainty inherent in the calculation of the average power factor.
Table 3.4.3 System Demand Table 3.4.3.1 Annual system maximum demand characteristics – MVA measure TOPSD0206 Transmission System	-	-	Yes The data are materially dependent on how the data in MW are "translated" to data in MVA The approach adopted in estimating this parameter is the best available in the	Divide Transmission System non-coincident weather adjusted summated maximum demand 50% PoE (TOPSD0106) by Average Overall Network Power Factor Conversion between MVA and MW TOPSD0301.	Accuracy is limited by the uncertainty inherent in the calculation of the average power factor.-

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[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
non-coincident weather adjusted summated maximum demand 50% POE			circumstances. Refer to note below		
Table 3.4.3 System Demand Table 3.4.3.3 Power factor Power factor conversion between MVA and MW TOPSD0301 Average overall network power factor conversion between MVA and MW	As per AER definition on page 24.	TransGrid's TUOS billing system	Yes These data are are not routinely calculated or used. The values are dependent on the method used to estimate them. The approach adopted in estimating this parameter is the best available in the circumstances.	TransGrid does not collect data to derive network wide power factors. However, there are data for reactive loading at some (but not all) bulk supply points. These data have been used to develop a broad approximation of system wide power factors. Refer to note below.	Refer to 'Note to TOPSD0301 to TOPSD0308'
Table 3.4.3 System Demand Table 3.4.3.3 Power factor Power factor conversion between MVA and MW TOPSD0302 to TOPSD0312 Average power factor conversion for lines, per voltage	As per TOPSD0301	TransGrid's TUOS billing system	Yes, as per TOPSD0301 The approach adopted in estimating this parameter is the best available in the circumstances.	As per TOPSD0301 Refer to note below.	As per TOPSD0301

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[6]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
level					

Note to TOPSD0201 to TOPSD0206 and TOPSD0301 to TOPSD0312

The nature of transmission systems is that they are "better" at transmitting real power (MW) than reactive power (MVAr)[7]. Consequently, reactive power needs are met on a more local basis, rather than a network wide basis. This involves the installation of reactive plant (such as shunt capacitors, shunt reactors, statcoms and static VAr compensators) at strategic locations, as well as utilisation of the reactive generation/absorption capability of generators. In some circumstances reactive plant may be installed in "downstream" networks, rather than at bulk supply points, if there is also a need to manage reactive power loadings within those networks.

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

- Deriving the real and reactive power loads for individual bulk supply points where data are available and usable[8] at the time of the summer and winter maximum demand for that bulk supply point; and
- Summating those individual bulk supply point maximum demands to derive undiversified (non-coincident) total summer and winter maximum demands and the associated power factors.

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

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

The reported quantities are the power factor for the season in which the maximum real power demand was the highest. As they are only very broad estimates, the figures are given to two only significant figures (to avoid a false sense of precision).

The summer and winter maximum real and corresponding reactive power loads at the individual bulk supply points are derived from revenue[9] and in some cases statistical metering data. Generally, the statistical metering uses the same class of metering instruments (current transformers, voltage transformers and meters) as the revenue metering at that site.

Summer has been taken to be late November to early March and winter May to August. Generally, winter maximum demands are more likely to occur in July and August than in May or June. Consequently, the power factors reported correspond to either the winter in which the regulatory (financial) year commences or the following summer, whichever has the higher real power maximum demand.

TransGrid's bulk supply points provide supply at a number of voltages (between 11 kV and 330 kV) with supply from most being at 66 kV or below. Also, those supplies are at what can be considered to be the "edges" of TransGrid's network. Thus power factor data at bulk supply points do not necessarily provide any meaningful information about the power factors of flows on transmission lines, operating at particular voltages, within TransGrid's network. Consequently, the power factors for the categories of transmission lines have been taken to be the same as those (broadly) estimated for the overall network. TransGrid does not have any 110 kV, 88 kV, 66 kV, 33 kV, 22 kV, 11 kV or 6.6 kV lines but is required to provide meaningful entries for this variable. Therefore the system average has been included.

Approved by (Group Manager): Mal Coble, Manager Network Support, Consultation and Pricing

9 The accuracy requirements for revenue metering installations are specified in the National Electricity Rules.

7.8 Worksheet 3.5 Physical Assets

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition[10]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 3.5.1.1 Overhead network length of circuit at each voltage TPA0101 to TPA0111	Overhead line total length operating at each voltage. Lines are reported at their operating voltage, although they may be constructed suitable for operation at a higher voltage. TransGrid has no Transmission Line assets at 275kV, 33kV or lower	Electrical Data Book TransGrid Asset Management Information System (TAMIS)	No	All line information relevant to TransGrid was downloaded from the Electrical Data Book and put into Excel. Available Line data was sourced from TransGrid's Asset Management Information System (TAMIS) and compared to Electrical data Books.	No assumptions were made in calculations as the asset is static Circuits with sections of split phase arrangement are counted as a single length.
Table 3.5.1.2 Underground cable circuit length at each voltage	Underground cable circuit length at each voltage. Cables are reported at their operating voltage,	Electrical Data Book TransGrid Asset Management Information System (TAMIS)	No	All cable information relevant to TransGrid was downloaded from Electrical Data Books and put into Excel Available cable data was sourced from TransGrid's Asset Management Information	No assumptions were made in calculations as the asset is static

[10] '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".**

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[10]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TPA0201 to TPA0211	although they may be constructed suitable for operation at a higher voltage. TransGrid has no Underground Cable assets at 500kV, 275kV, 220 kV, 66kVor lower			System (TAMIS) and compared to Electrical data Books.	
Table 3.5.1.3 Estimated overhead network weighted average MVA capacity by voltage class TPA0301 to TPA0311	This variable is interpreted as the sum of all {peak transmission circuit capacity * relevant circuit lengths} for all circuits at each voltage level , divided by the total circuit length for that voltage level TransGrid has no Transmission Line assets at 275kV, 33kV or lower	Uses other calculated value: TPA0101 to TPA0111 TransGrid Operating Manuals: OM304 Ratings of Main Grid Circuits • OM305 Ratings of Subsystem Circuits In Northern Region • OM 306 - Ratings Of Subsystem Circuits In Central Region • OM307 - Ratings of Subsystem Circuits In Southern Region AEMO Price and Demand data files	No	AEMO NSW price/demand data (30 minute) was used to determine the time of maximum demand for each FY. Line ratings vary on time of year and time of day, this AEMO data was used to determine which rating to use. The version of OM304, OM305, OM306 or OM307 that was current at the time of maximum demand was obtained. The "Normal MVA" ratings applicable for the time of maximum demand for each line were entered into a spreadsheet which multiplied the rating with the length of the line (obtained as part of the TPA0101 to TPA0111 calculation) to give a MVA.km value. The sum of the MVA.km values was then divided by the determined kilometres for the voltage class in TPA0101 to TPA0111	Constrained values are included where applicable. E.g. A line rating may be constrained by terminal equipment (such as CT's, wavetraps, etc). In this case the constrained value will be entered, not the line rating Where the ratings are dependant on the loadflow direction, the most likely direction will be shown. This is based on: • Load will be going away from Generator sites • Load is assumed to

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[10]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
					flow from the higher voltage site, or site closest to the higher voltage network. Where a new line is commissioned or altered after the maximum demand event occurs, the rating shown will be the appropriate season's rating at the end of the financial year.
Table 3.5.1.4 Estimated underground network weighted average MVA capacity by voltage class TPA0401 to TPA0411	This variable is interpreted as the sum of all {peak transmission circuit capacity * relevant circuit lengths} for all underground circuits at each voltage level, divided by the total underground circuit lengths at that voltage level TransGrid has no Underground Cable assets at 500kV, 275kV, 220 kV, 66kVor lower	TransGrid Operating Manual OM304 Ratings of Main Grid Circuits TransGrid Data book AEMO Price and Demand data files (from public website)	No	AEMO NSW price/demand data (30 minute) was used to determine the time of maximum demand for each FY. This file was used for all voltage classes. The version of OM304 that was current at the time of maximum demand was obtained. The normal cyclic rating was multiplied by the length of the circuit to give an MVA.km value. The sum of the MVA.km values was then divided by the determined kilometres for the voltage class TPA0202 to TPA211 to determine a weighted average MVA.	It is assumed that the AER require Cyclic rating for underground cables.

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[10]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 3.5.1.5 Installed transmission system transformer capacity TPA0501 Transmission substations (eg 500 kV to 330 kV)	These were taken to be the sum of nameplate capacities of transformers with a primary winding voltage rating of 220 kV and above. This was based on the assumption that the transformers are used in a transmission substation that supplies a subtransmission network.	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	No.	1. Create valid list A valid list of transformers current at January 2014 was compiled. Non current records were filtered from the equipment register data and reviewed to remove a small number of errors. Spares were separately identified by using 'ACTIVE_FLG' 2. 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. 3. Trace each year's data Tracing data was used to identify transformers in service for each financial year in the required range using the January 2014 information as the base. System spares were cross checked using amendments of GM AS S1 009.	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 = 2005/2006. 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.
Table 3.5.1.5 Installed transmission system transformer capacity	Transformers with a primary voltage rating of 132 kV were assumed to fall into	As for TPA0501	No	As for TPA0501	As for TPA0501

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[10]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TPA0502 Terminal points to DNSP systems	this category unless they were used for direct customer supply (see below). In the TransGrid network these transformers are generally installed in rural substations used to supply a DNSP distribution level network.				
Table 3.5.1.5 Installed transmission system transformer capacity TPA0503 Transformer capacity for directly connected end–users owned by the TNSP	Transformers used to supply direct customers exclusively. Owned by TransGrid. One transformer (Equipment reference SWSGAD1A2) was identified that falls into this category.	As for TPA0501 Information from Customer Access files and Connection Agreements	No	As for TPA0501 Used to identify direct customer connected transformers	As for TPA0501
Table 3.5.1.5 Installed transmission system transformer capacity TPA0504 Transformer capacity for directly connected end–users owned by the end–user	Transformers used to supply direct customers exclusively. Owned by the customer. These transformers were separately identified and are not part of TransGrid's asset management system	As for TPA0501 Information from Customer Access files and Connection Agreements	No	As for TPA0501 Used to identify direct customer connected transformers. Operating diagrams were also used to obtain transformer ratings.	As for TPA0501

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[10]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	and their categorisation was obvious.				
Table 3.5.1.5 Installed transmission system transformer capacity TPA0505 Interconnector capacity	These were taken to be transformers used to directly connect interstate. None were identified.	As for TPA0501	No	As for TPA0501	As for TPA0501
Table 3.5.1.5 Installed transmission system transformer capacity TPA0506 Dedicated SVC transformers	SVC transformers are provided to connect SVCs to the network. They do not fit into the other provided categories	As for TPA0501	No	As for TPA0501	As for TPA0501
Table 3.5.1.6 Cold Spare Capacity TPA06 Cold Spare capacity	Transformers that are not connected to the network and are used as spares to cover against possible failure.	As for TPA0501	No	As for TPA0501	As for TPA0501

Approved by (Group Manager): Garrie Chubb, Manager/Asset Performance

7.9 Worksheet 3.6 Quality of Services

On 4 September 2014, the AER advised that 2013 Calendar Year data is required for Worksheet 3.6 Quality of Services, and as TransGrid has already provided data for Calendar Year 2013 in response to the initial Benchmarking RIN, it is not required to provide the data for this worksheet again.

7.10 Worksheet 3.7 Operating Environment

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[11]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TEF0101 Total number of maintenance spans	Where the contractor has claimed and been paid for maintenance work in a span it is counted as a maintenance span. Where the TransGrid line inspector has trimmed/removed a couple of trees as part of the inspection and not recorded them, it is not a maintenance	The data is sourced from the vegetation maintenance contractors who prepare an invoice input spreadsheet as part of their invoices submitted for vegetation maintenance.	Yes TransGrid has not directly collected the total number of spans maintained in 2013-14.	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 staff have trimmed a tree or trees during a line inspection, this information has not been recorded, so these spans are not counted as maintenance spans.

[11] '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".**

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[11]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	span.				
TEF0102 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	Yes. Some lines or line sections are not specifically listed in the GM AS L5 002 or GM AS L1 001 documents due to recent rearrangements and policy documents not being updated. These sections will not make a significant material change to the overall average figures, and an estimated maintenance frequency was used based upon knowledge of the vegetation situations and other lines in the areas. Where lines cross regional maintenance boundaries, there may be a variation in the designated vegetation maintenance frequency as the general topography 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.	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"

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[11]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TEF0103 Average number of trees per maintenance span (0's)	Average number of trees per maintenance span is the number of trees maintained in that span, as trees not maintained are not counted.	The number of trees can generally be 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 as part of their invoices submitted for vegetation maintenance.	Yes. 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 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.	Hourly rate total hours are converted to trees using a trees per hour figure for the various maintenance activities. Hectare rate total hectares maintained 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.	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: • Hectare Hand Clearing – 4 m^2 crown – 2500 trees/hectare @100% coverage • Hectare Mulching – 2 m^2 crown – 5000

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[11]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
					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 – 20 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

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[11]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
					• Pruning by EWP – 2 trees per hour • Tritter/Excavator – 70 trees per hour • Small Mulcher – 30 trees per hour • Medium Mulcher – 150 trees per hour • Large Mulcher – 150 trees per hour • Mechanical Pruning (Jaraff, etc) – 50 trees per hour
TEF0104 Average number of defects per vegetation maintenance span	A defect tree is a tree that is identified as being within the clearance requirements of GM AS L1 005 – "Maintenance of Easements and Access Tracks" at the time of maintenance work A defect tree is counted if the identified tree was in a span where maintenance was carried out in the	The results from TransGrid's Routine LiDAR scanning of the network for vegetation infringements.	Yes. Not all spans maintained have LiDAR inspection results, as the LiDAR is in a maximum three year cycle, and there have only been two inspection cycles to date. Defect vegetation is in contravention to the requirements of GM AS L1 005 where maintenance work is expected to take into account regrowth prior to the next maintenance cycle such that vegetation never encroaches on safe	For each Maintenance Span, LiDAR results were reviewed in a graphical format as a Google Earth overlay. As there are many laser points per tree crown (approximately 20 points per square metre), a visual assessment and estimate was done to identify a defect tree count. Where there was no coverage in year 2 LiDAR, year 1 lidar was used where available. Year 1 LIDAR did not have so much detail as year 2, so was limited to a maximum of three trees per span.	The tree count is based upon the aerial imagery available on Google Earth, so is a visual estimate. There are Maintenance Spans where there is no LiDAR coverage at this stage, so these spans are counted as zero defect trees. A count of zero in the source documentation does not mean there was no coverage, it generally means no trees. No record was kept of where

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[11]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	applicable year		clearances to conductors.		there was no LiDAR coverage.
TEF0105 – Tropical Proportion Number of spans – result: 2617 spans	-	Climate zone map http://www.bom.gov.au/jsp/ncc/climate_averages/climate-classifications/index.jsp TAMIS (GIS system)	No	Climate zone digital map utilised to run query in GIS (TAMIS) based on spans within class "Warm Humid Summer"	-
TEF0106 Standard vehicle access	An area with no Standard Vehicle Access would not be accessible by a two wheel drive vehicle Value provided is length of network which is accessible by 2WD vehicle	Ellipse report on electronically recorded mains inspections carried out from 2009 to 2014. TAMIS report on electronically recorded mains inspections carried out from 2001 to 2010. TAMIS structure report	Yes Not all structures have electronically recorded mains inspections stored in Ellipse or TAMIS. Out of all of the structures in the Network, approximately 75% have electronically recorded mains inspections stored in Ellipse or TAMIS. Results relating to the recorded inspections have been extrapolated to the remainder of the Network. The mains inspections have a question to answer in regard to vehicle access. This was never intended to indicate whether there is 2WD access to structures. Responses to this question	A report has been produced from Ellipse using the Asset management CUBE, listing the inspection results. The latest result available from 2009 - 2014 per structure has been chosen. A report has been produced from TAMIS using the 'Mains Inspection' data set, listing the inspection results. The 'Current' inspection result has been filtered out from the overall list. A report from TAMIS of all the structures has been retrieved. This report has been filtered to remove structures that have no geometry, filtering out those that do not belong to TransGrid. The structure listing has not been verified against other structure counts and listings as the output number is already an extrapolation. The structure listing is then populated with the latest inspection results from Ellipse	Access regarded as 'OK' or 'Yes' in the mains inspection has been allocated as 2WD accessible. Many structures west of the Great Dividing Range are either on rolling paddocks or very flat land, so should be accessible by 2WD vehicle. Many structures east of the Great Dividing Range are in areas generally accessible by 2WD vehicles. TransGrid transmission lines are not designed to be alongside roadways. Access by TransGrid staff is expected to be using 4WD vehicles, so an

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[11]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
			have indicated 4WD, Blocked, Fenced, In Crop, OK or Yes. Where the access is listed as OK or Yes, these have assumed to be 2WD accessible. Line inspectors may have indicated that access was OK where they were able to access in their 4WD vehicle, but a 2WD vehicle may not have been suitable. From these inspection results, the percentage of structures noted as OK or Yes out of only those with an electronically recorded inspection has been applied to the route line length and rounded to the nearest 100km.	and TAMIS. The preference is to take the Ellipse result, as this is more recent. A percentage of the available results that are 'OK' or 'Yes' is multiplied by the network line length and rounded to the nearest 100km. The same percentage (80.9%) is used for each year, as the figure is considered reasonable.	access identified as OK is possibly not able to be accessed by a 2WD vehicle, and access identified as 4WD may be 2WD accessible, but as the staff member used a 4WD vehicle, it was listed as 4WD. The outcome of 80.9% of the network is considered a reasonable estimate. What is considered accessible by 2WD on any given day could easily change if it rained overnight. A gentle slope when wet on a grassed paddock will stop most 2WD vehicles.
TEF0107 – Altitude Length of line (km) above elevation 600 metres – Result 3772 km	-	25m grid spot height data http://www.lpi.nsw.gov.au/mapping_and_imagery/spatial_data/topographic_data	No	The structure location referenced against spot heights within 30m to determine if elevation above 600m. If the structure was above then attached spans included for length calc	-
TEF0108 – Bushfire Risk Number of spans – result 16307 spans	AER classification is "high". RFS classification is either Category 1, 2 or buffer	Bush Fire Prone Lands (BFPL) http://www.rfs.nsw.gov.au/dsp_content.cfm?cat_id=1052	No	Digital map of BFPL used to run query against spans in either Category 1, 2or buffer lands	RFS web site documents all category 1, 2 and buffer lands as bush fire prone lands

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[11]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
TEF0201 Route line length	The length of line routes. Where a line is a double circuit line, that section of the route is only counted once.	Electrical Data Book TransGrid Asset Management Information System (TAMIS)	Yes Some manual adjustments were made to the data extracted from TAMIS and the Electrical Data Book to account for slight changes to the network not recorded in these sources as at 30/6/14.	All line information relevant to TransGrid was downloaded from Electrical Data Books and put into Excel. This was used to determine the date on which all lines were energised. Available Line data was sourced from TransGrid's Asset Management Information System (TAMIS) and compared to Electrical data Books. Totals of line route lengths were calculated from source spreadsheets, including the manual adjustments to match project records and site knowledge.	No assumptions were made in calculations as the asset is static
TEF0202 Variability of Dispatch	AER definition refers to non-thermal generators. Thermal generators have been taken to be generators using steam turbines. Using this definition, non-thermal generators are wind turbines, hydro generators and open cycle gas turbines.	TransGrid's TUOS billing system	Yes Data is materially dependent on how the data in MW is "translated" to data in MVA.	Uses data calculated for Energy In as part of calculations for TQS03. This is total Energy Input into TransGrid network. Percentage is taken of 'non-thermal' generation to total Energy Input.	In calculating this measure only generators which are connected to TransGrid's network have been considered. The definition refers to non-thermal generators. Thermal generators have been taken to be generators using steam turbines. Using that definition, the non-thermal generators are wind turbines, hydro generators and open cycle gas turbines.

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[11]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
					Embedded generators have been included in the calculations.
TEF0203 Concentrated Load Distance	AER definition refers to individual nodes with 30% capacity of generation/load. For a transmission network the size of TransGrid's, it would not be prudent to configure the network such that there is 30% or more of generation/load at risk for a major event at a single location. To satisfy criteria of 30% or more generation/load, groups of nodes are considered, allowing a concentrated load distance to be derived.	Data from that used to calculate TEF0201	Yes As nodes within each group are separate, using groups of nodes does not automatically give a single figure for the concentrated load distance.	The definition of this parameter mentions nodes which have at least 30% of generation capacity or load connected to them. For a transmission network transporting the magnitude of load that TransGrid's network does, it would not be prudent to configure it in a way which places 30% or more of generation or load at risk for a major event at a single location. Consequently, no individual nodes within TransGrid's network meet the criteria. However, if groups of nodes in relatively close geographical proximity are considered, rather than single nodes, it is possible to derive a concentrated load distance. In this case the most widely separated groups of nodes are those in the Snowy Mountains area (generation connected at Murray, Upper Tumut and Lower Tumut) and in the Sydney basin (loads connected at Beaconsfield West, Ingleburn, Liverpool, Macarthur, Regentville, Sydney East, Sydney North, Sydney South, Sydney West and Vineyard).	Groups of nodes in close geographical location are considered to be 30% of generation or load. The most widely separated groups are those in the Snowy Mountains area and in the Sydney basin. The average of the route line lengths between the closest nodes in the two areas and the two nodes furthest apart.
TEF0204 Total number of spans	The total number of spans on the network	Electrical Data Book TransGrid Asset Management Information System	Yes Some manual adjustments	Totals of structure counts were calculated from source spreadsheets, including the manual adjustments to match project	The number of spans equals the number of structures. This is

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[11]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
		(TAMIS)	were made to the data extracted from TAMIS and the Electrical Data Book to account for slight changes to the network not recorded in these sources as at 30/6/14.	records and site knowledge.	suitably accurate as compared to the 'number of structures less one' per line as requested in the instructions, as there are a number of times in the network where there will be multiple spans counted for one structure, and the significance of actual span count differences is very small.

Note to TEF0103

For hectare rates, the following vegetation crown densities apply:

- Scattered is <5% coverage, use 3% (not used in contracts in place in 2012-3)
- Light is 5-15% coverage, use 10%
- Medium is 15-25% coverage, use 20%
- Heavy (or high) is >25% coverage, use 60% 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:

- Hectare Hand Clearing – 2 m2 crown – 5000 trees/hectare @100% coverage
- Hectare Mulching – 2 m2 crown – 5000 trees/hectare @100% coverage
- Hectare Slashing or Spraying – 1 m2 crown – 10,000 trees/hectare @100% coverage

For hourly rates, the following progress is estimated:

- Hand clearing – 20 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 – 10,000 trees per hour
- Pruning by climbing – 1 tree per hour
- Pruning by EWP – 2 trees per hour
- Tritter/Excavator – 150 trees per hour
- Small Mulcher – 250 trees per hour
- Medium Mulcher – 450 trees per hour
- Large Mulcher – 450 trees per hour

Approved by (Group Manager): Garrie Chubb, Manager/Asset Performance (all variables except TEF0202 & TEF0203)

Approved by (Group Manager): Mal Coble, Manager Network Support, Consultation and Pricing (TEF0202 & TEF0203)

7.11 Worksheet 3.7.4 Weather Stations

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[12]? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Weather Stations	Listing of weather stations in NSW and an assessment of materiality to assets	Source Data - http://www.bom.gov.au/climate/data/stations/ - Choose NSW/ACT state, and stations that provide dry bulb temperature, and wind speed, at half hourly intervals each	No	Site listing numbers generated by copying the two site number listings (dry bulb temperature, wind speed), sorting and removing duplicates. Only weather stations that record both wind speed and dry bulb temperature and have data available up to 30/6/2014 are listed. These are then compared to the transmission network, and are considered material to operations if the closest transmission line structure is 50km or less away. The position of the weather station as listed by the BOM is compared in the TAMIS GIS system for distance to the closest transmission line structure	The weather station listing is sourced only from the stations that measure at least half hourly dry bulb temperature and wind speed. These are the only two factors that apply to transmission line rating calculations, so these are the only station listings extracted from the BOM

Approved by (Group Manager): Garrie Chubb, Manager/Asset Performance