Jemena Electricity Networks (Vic) Ltd

Response to the Category Analysis Regulatory Information Notice

Basis of Preparation

Information for the 2017 regulatory year

Public

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OVERVIEW

1. This basis of preparation document has been prepared by Jemena Electricity Networks (Vic) Ltd (**JEN**) in response to the category analysis Regulatory Information Notice (**RIN**), covering calendar year 2017. RIN data templates and accompanying audit report and review report are due to the Australian Energy Regulator (**AER**) by 30 April 2018. The RIN was served upon JEN by the AER under the National Electricity Law (**NEL**) on 7 March 2014.

2. Section 1.2 of Schedule 2 of the RIN requires JEN to prepare a 'basis of preparation' in accordance with the requirements specified in Schedule 1. This document—JEN's basis of preparation—for each variable and any other information:

    1. Demonstrates how the information provided is consistent with the requirements of the RIN
    2. Explains the source from which JEN obtained the information provided
    3. Explains the methodology JEN applied to provide the required information, including the assumptions (if any) JEN made
    4. Explains, in circumstances where JEN cannot provide input for a variable using actual information and therefore must provide input using estimated information:

        a) why an estimate is required, including why it is not possible for JEN to use actual financial Information or actual non-financial information (as the case may be, depending on the variable)

        b) the basis for the estimate, including the approach used, assumptions made and reasons why the estimate is JEN's best estimate, given the information sought in the RIN

        c) actions JEN is taking to enable it to report actual information in the future.

3. The RIN requires that the basis of preparation—for every variable in the Excel templates—explains the basis upon which JEN prepared information to populate the input cells. JEN notes that the AER intends to publish JEN's basis of preparation along with the RIN Excel templates.

4. JEN considers this basis of preparation complies with the AER requirement that the basis of preparation must follow a logical structure that enables auditors, assurance practitioners and the AER to clearly understand how JEN has complied with the requirements of the RIN. Each section of this basis of preparation corresponds to align a worksheet in the Excel templates.

5. JEN has included in its basis of preparation all other information JEN prepared in accordance with the requirements of the RIN.

DEFINITIONS OF ACTUAL AND ESTIMATED INFORMATION

6. Interpretation of the definition of actual and estimated information from the RIN, including the additional guidance provided by the AER in Attachment 7 of JEN's preliminary determination in October 2015, requires judgements to be made as to the appropriate classification of information including:

    - the extent to which the information is materially dependent on information recorded in JEN's business records; and
    - the degree of estimation involved and whether the information is contingent upon judgements and assumptions for which there are valid alternatives, which could lead to a materially different presentation.

7. Based on this, and consistent with the definition contained in the RIN, JEN has applied the following definition of actual information in its response to the RIN:

> *Information whose presentation is materially dependent on JEN's business records, and whose presentation is not contingent on judgements and assumptions for which there are valid alternatives, which could lead to a materially different presentation in response to the RIN.*

8. Where the presentation of information involves calculation and this information is presented as actual information, JEN considers that this information's presentation:

   - is materially dependent on JEN's business records; and
   - is not contingent on judgements and assumptions for which there are valid alternatives, which could lead to a materially different presentation.

9. Information is classified as estimated where it is not classified as actual.

10. The methodologies, assumptions and judgements made in respect of variables are described in the relevant sections throughout this basis of preparation document.

PROVISION OF ESTIMATED INFORMATION IN RESPONSE TO THE RIN

11. The RIN requires JEN to report actual data effective from 2016 onwards (barring a number of exclusions specified in section 1.6 of Appendix E of the RIN). This requirement to report actual data varies from the reporting obligations under the same RIN in 2014 and 2015, which permitted the reporting of estimated information.

12. In JEN's 2016-20 Electricity Distribution Price Review Regulatory Proposal, Revocation and substitution submission (**revised submission**), we:

   - Highlighted that JEN would not be compliant from 2016 with requirements for the RIN to report actual data to the extent required; and
   - Proposed an operating expenditure step change to recover the necessary costs that JEN will incur in making the necessary changes to its processes to ensure that compliance with the RIN is achieved.

13. Upon review of our revised submission, the AER approved the step change allowance recognising the additional costs necessary to comply with the RIN obligation to report actual data.

14. On 17 August 2017, JEN advised that AER that while it has commenced system and process changes to enable it to report actual data in the future, it will be unable to provide actual data in all required cases for the 2017 regulatory year.

15. On 25 August 2017, the AER advised JEN that it accepted JEN's need to provide some estimated data in its response to the RIN for 2017.

BEST ESTIMATES

16. Where JEN cannot populate an input cell in the information templates with actual information, it has provided its best estimate.

17. For each instance where JEN has provided estimated information in response to the RIN, this basis of preparation document provides the relevant explanations required by section 1.2 of Schedule 2 of the RIN, in addition to stating what actions JEN is taking to report actual data in the future.

ACTIONS TO REPORT ACTUAL DATA

18. JEN is currently undertaking a project (consistent with that which it proposed in its 2016-20 regulatory proposal) to identify and implement actions necessary to report actual information in the future.

19. JEN is currently working to implement various initiatives under this project in a way which aligns efficiently with its broader IT project work-plan. We note that, where an initiative designed to allow the reporting of a specific piece of information as actual is not fully implemented by the start of a reporting year (1 January), it is unlikely that information could be reported as actual until the next reporting year.

20. his basis of preparation document describes actions JEN is taking to report actual data. As at the date of this submission, there are some variables for which JEN is still refining the nature and scope of some of the actions outlined in this basis of preparation document. The final actions implemented by JEN may therefore differ from those described in this document.

21. Additionally, this basis of preparation document describes a number of changes to JEN's systems and/or processes which may need to be made. Where JEN implements such changes, it will also undertake change management and staff training activities where necessary to support the effective implementation of such changes.

GLOSSARY

AER	Australian Energy Regulator
CAM	Cost Allocation Methodology
CATS	Cross Application Time Sheet
CMOS	Customer Minutes Off Supply
CPI	Consumer Price Index
DAPR	Distribution Annual Planning Report
ELCMP	Electric Line Clearance Management Plan
ERP	Enterprise Resource Planning
ESV	Energy Safe Victoria
GIS	Geographic Information System
HBRA	Hazardous Bushfire Risk Area
HV	High Voltage
IMS	Investment Management System
JEM	Jemena Limited
JEN	Jemena Electricity Networks (Vic) Ltd
LBRA	Low Bushfire Risk Area
LV	Low Voltage
NEL	National Electricity Law
OMS	Outage Management System
PM	Plant Maintenance
PMO	Project Management Office
RIN	Regulatory Information Notice
UG	Underground
VMS	Vegetation Management System

2.1 EXPENDITURE SUMMARY

General Approach

JEN considers all information reported in 2.1 Expenditure Summary as actual information, as the totals are sourced from JEN's SAP system.

2.1.1 STANDARD CONTROL SERVICES CAPEX

Actual information

Variable	Source and why actual	Methodology	Assumptions
Replacement Expenditure (Repex)	The data is sourced from template 2.2 Repex.	Refer to the Basis of Preparation for 2.2 Repex.	n/a
Connections	The data is sourced from template 2.5 Connections.	Refer to the Basis of Preparation for 2.5 Connections.	n/a
Augmentation Expenditure (Augex)	The data is sourced from template 2.3 Augex.	Refer to the Basis of Preparation for 2.3 Augex.	n/a
Non-network	The data is sourced from template 2.6 Non-network Expenditure.	Refer to the Basis of Preparation for 2.6 Non-Network Expenditure.	n/a
Capitalised Network Overheads	The data is sourced from template 2.10(A) Overheads.	Refer to the Basis of Preparation for 2.10(A) Overheads.	n/a
Capitalised Corporate Overheads	The data is sourced from template 2.10(A) Overheads.	Refer to the Basis of Preparation for 2.10(A)Overheads.	n/a

Variable	Source and why actual	Methodology	Assumptions
Balancing item	The balancing item is the outcome from the reconciliation made to SCS Capex reported in the Category Analysis RIN submissions. As the items making up the balance consist of actual items the data is considered actual.	The balancing item shown reflects the amounts of capex reported more than once within the Regulatory templates (which relate to Repex; Connections; Non-network; and Metering).	n/a
Capcons (Capital Contributions)	This information is sourced directly from JEN's SAP ERP system.	This data is derived from a defined general ledger account.	n/a

2.1.2 STANDARD CONTROL SERVICES OPEX

Actual Information

Variable	Source and why actual	Methodology	Assumptions
Vegetation Management	The data is sourced from template 2.7 Vegetation Management.	Refer to the Basis of Preparation for 2.7 Vegetation Management.	n/a
Maintenance	The data is sourced from template 2.8 Maintenance.	Refer to the Basis of Preparation 2.8 Maintenance.	n/a
Emergency Response	The data is sourced from template 2.9 Emergency Response.	Refer to the Basis of Preparation 2.9 Emergency Response.	n/a
Non-network	The data is sourced from template 2.6 Non-network expenditure.	Refer to the Basis of Preparation 2.6 Non-network expenditure.	n/a

Variable	Source and why actual	Methodology	Assumptions
Network Overheads	The data is sourced from template 2.10(A) Overheads.	Refer to the Basis of Preparation 2.10(A) Overheads.	n/a
Corporate Overheads	The data is sourced from template 2.10(A) Overheads.	Refer to the Basis of Preparation 2.10(A) Overheads.	n/a
Balancing item	The balancing item is the outcome from the reconciliation made to SCS Opex reported in the Category Analysis RIN submissions. As the items making up the balance consist of actual items the data is considered actual.	The balancing item shown reflects the amounts of opex reported more than once within the Regulatory templates (which relate to Non-network; Corporate and Network Overheads and Maintenance).	n/a

2.1.3 ALTERNATIVE CONTROL SERVICES CAPEX

Actual information

Variable	Source and why actual	Methodology	Assumptions
Connections	The data is sourced from template 2.5 Connections.	Refer to the Basis of Preparation 2.5 Connections.	n/a
Capitalised Network Overheads	The data is sourced from template 2.10(A) Overheads.	Refer to the Basis of Preparation 2.10(A) Overheads.	n/a
Capitalised Corporate Overheads	The data is sourced from template 2.10(A) Overheads.	This data is derived from a defined general ledger account as ACS Capex Overhead is not reportable under 2.10(A) Overheads.	n/a

Variable	Source and why actual	Methodology	Assumptions
Metering	The data is sourced from template 4.2 Metering.	Refer to the Basis of Preparation 4.2 Metering.	n/a
Public lighting	The data is sourced from template 4.1 Public lighting.	Refer to the Basis of Preparation 4.1 Public lighting.	n/a
Fee and quoted	The data is sourced from templates 4.3 Ancillary services – Fee based services and 4.4 Ancillary services – Quoted services.	Refer to the Basis of Preparation 4.3 Ancillary services – Fee based services and 4.4 Ancillary services – Quoted services.	n/a
Balancing item	The balancing item is the outcome from the reconciliation made to ACS Capex reported in the Category Analysis RIN submissions. As the items making up the balance consist of actual items the data is considered actual.	The balancing item shown reflects the amounts of capex reported more than once within the Regulatory templates (which relate to Fee based; Quoted; and Non-network), less the ACS capex amounts not required to be reported under the Annual RIN.	n/a

2.1.4 ALTERNATIVE CONTROL SERVICE OPEX

Actual information

Variable	Source and why actual	Methodology	Assumptions
Network Overheads	The data is sourced from template 2.10(A) Overheads.	Refer to the Basis of Preparation 2.10(A) Overheads.	n/a
Corporate Overheads	The data is sourced from template 2.10(A) Overheads.	Refer to the Basis of Preparation 2.10(A) Overheads.	n/a

Variable	Source and why actual	Methodology	Assumptions
Metering	The data is sourced from template 4.2 Metering.	Refer to the Basis of Preparation for 4.2 Metering.	n/a
Public lighting	The data is sourced from template 4.1 Public lighting.	Refer to the Basis of Preparation for 4.1 Public lighting.	n/a
Fee and quoted	The data is sourced from templates 4.3 Ancillary services – Fee based services and 4.4 Ancillary services – Quoted services.	Refer to the Basis of Preparation for 4.3 Ancillary services – Fee based services and 4.4 Ancillary services – Quoted services.	n/a
Balancing item	The balancing item is the outcome from the reconciliation made to ACS Opex reported in the Category Analysis RIN submissions. As the items making up the balance consist of actual items the data is considered actual.	The balancing item shown reflects the amounts of opex reported more than once within the Regulatory templates (which relate to Network Overheads and Metering).	n/a

2.1.5 DUAL FUNCTION ASSETS CAPEX

Not applicable to JEN.

2.1.6 DUAL FUNCTION ASSETS OPEX BY CATEGORY

Not applicable to JEN.

2.2 REPEX

2.2.1 REPLACEMENT EXPENDITURE, VOLUMES AND ASSET FAILURES BY ASSET CATEGORY

Actual information

Variable	Source and why actual	Methodology	Assumptions
GENERAL COMMENTS (apply to expenditure column for all asset groups); REPLACEMENT EXPENDITURE, ASSET CATEGORY Table 2.2.1	JEN uses its Enterprise Resource Planning (**ERP**) system SAP ERP, to capture costs associated with Repex. SAP ERP collects costs based on the activity on which an employee works and the activity to which external costs are associated. These aggregate into Work Breakdown Structures (WBS Elements) (higher level cost collector) which in turn aggregates the costs at a project level. Capex expenditure categorisation is based upon activity/service category codes included in the WBS Elements coding. SAP ERP Master data contains regulatory classification data which is cross-checked against a separate Investment Management System (**IMS**) Mapping table.	Capex data is categorised per activity and service codes and are summarised into the relevant regulatory category. SAP ERP Master Data is used to populate the relevant sections of the template which is then cross checked with the separate IMS Mapping table. All expenditure line items are assigned to the appropriate classifications based upon the project activity and description. The information is extracted using a data extraction tool, Business Intelligence (**BI**) and exported into Excel for analysis and sorting into the RIN tables, by regulatory category. The first (and highest) level category used was “Asset Group”. These classes corresponded to the high level data input requirements of the category analysis RIN template. The following nine classes were used: • Poles	N/A.

Variable	Source and why actual	Methodology	Assumptions
	Repex is split into sub-categories based on volume data sourced from SAP ERP and other relevant systems. As the data is maintained within internal information systems, it is considered actual information.	• Pole top Structures • OH Conductors • UG Cables • Service Lines • Transformers • Switchgear • Public Lighting • SCADA, Network Control and Protection Systems • Other The second (and lowest) level category used was “Asset Category”. The categories corresponded to the detailed level data input requirements of the category analysis RIN template. The information gathered (by the process described above) was analysed and sorted in excel (via v-lookup function and pivot tables) to provide an input sheet for entry of the data into Table 2.2.1 of the category analysis RIN template. Where JEN’s expenditure categories did not precisely match the template classifications further analysis was performed on the detailed project data to allocate costs within high level asset categories across the detailed line items contained in the category analysis RIN template.	

Variable	Source and why actual	Methodology	Assumptions
		To achieve the lowest level of expenditure to the asset category, the cost assigned to the Asset Group was split by the actual volume record for the year.	
ASSET FAILURE - VOLUMES (for all of table 2.2.1)	Asset Failures Source of data: Outage Management System (OMS) – Outage notification report (accidental) and incident register for all single premise asset, e.g. fuses and services. This data was able to be provided without estimation due to the completeness of the outage notification report (unplanned events). For public lighting(poles etc.) assets the data is sourced from SAP ERP Notifications. The notifications for these assets are created against the specific equipment that requires replacement. This allows the attributes of each asset class to be analysed and reported on.	The service related fault data from OMS is filtered for the date of the event. The report is filtered by(the following 3 items): 1. Year -> 2017 2. Outage type -> Premises (PR), Remark -> *serv* 3. Primary cause of description that aligns with the definition of asset failure. - Asset – Electrical Failure - Asset – Mechanical Damage - Service - Mech Failure - Service - Elec Failure - Elements – Aged and deteriorated - Misc – No Identified Cause For fault data (items excluding services) from SAP ERP, notifications were listed for 2017 where the notification was created by the control room. These notifications were analysed and filtered for each asset category in the RIN.	No assumptions were made.
OVERHEAD CONDUCTORS BY:	The data is sourced from JEN's internal SAP ERP systems.	**Extract from for calendar year 2017:**	Overhead Conductor was replaced in the year that it was booked to the job.

Variable	Source and why actual	Methodology	Assumptions
HIGHEST OPERATING VOLTAGE; NUMBER OF PHASES (AT HV) (ASSET REPLACEMENTS)	As the data is maintained within internal information systems, it is considered actual information.	JEN extracted PM Orders associated with projects linked to Overhead Conductor replacement activities (BAA-ROH, ROL, ROA) using IW39 transaction in SAP ERP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2017 is reported as conductor replaced in 2017. These associated characteristics along with the Functional Location linked to the relevant PM Order were used to determine the split of Overhead Conductor replaced by classification and voltage and to facilitate the derivation of the route length from the length of conductor booked. Where this data was not readily available individual PM Orders and/or PS Networks were individually interrogated to determine these details. The split of OH Conductor Replacement quantities between Urban and Short Rural were determined by considering the Feeder associated with the OH conductor replaced. The feeders designated as Short Rural are: • COO-011 • SA0-002 • SBY-011 • SBY-014 • SBY-032 • SHM-011	The length of Overhead conductor booked to the job equals the length of individual Overhead conductors replaced.

Variable	Source and why actual	Methodology	Assumptions
		• KLO-013 • KLO-022 All other distribution and subtransmission feeders are designated Urban.	
UNDERGROUND CABLES BY: HIGHEST OPERATING VOLTAGE (ASSET REPLACEMENTS)	The data is sourced from JEN's internal SAP ERP systems. As the data is maintained within internal information systems, it is considered actual information.	**Extract from SAP ERP for calendar year 2017:** JEN extracted PM Orders associated with projects linked to Underground cable replacement activities (BAA-RUA, RUC, RUS) using IW39 transaction in SAP ERP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2017 is reported as cable replaced in 2017. These associated characteristics along with the Functional Location linked to the relevant PM Order were used to determine the split of Underground cable replaced by classification and voltage and to facilitate the derivation of the route length from the length of cable booked. The split of Underground (**UG**) Cable Replacement quantities between Urban and Short Rural was determined by considering the Feeder associated with the UG Cables replaced. The feeders designated as Short Rural are • COO-011 • SA0-002 • SBY-011	All Underground Cable was replaced in the year that it was booked to the job. The length of cable booked to the job equals the length of cable replaced.

Variable	Source and why actual	Methodology	Assumptions
		• SBY-014 • SBY-032 • SHM-011 • KLO-013 • KLO-022 All other distribution and subtransmission feeders are designated Urban.	
TRANSFORMERS BY: MOUNTING TYPE; HIGHEST OPERATING VOLTAGE ; AMPERE RATING; NUMBER OF PHASES (AT LV) (ASSET REPLACEMENTS)	The data is sourced from JEN's internal SAP ERP systems. As the data is maintained within internal information systems, it is considered actual information.	**Extract from SAP ERP for calendar year 2017:** JEN extracted PM Orders associated with projects linked to transformer replacement activities (BAA-RHB, RHD, RHE, RHK, RHM) using IW39 transaction in SAP ERP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2017 is reported as transformers replaced in 2017. The material description, which contains the transformer voltage, rating and phase details, was used to determine the split of transformers by these attributes as required in the template.	The transformers were replaced in the year that they were booked to the job. The number of transformers booked to these jobs over the period in question equals the number of transformers replaced.
SWITCHGEAR BY: HIGHEST OPERATING	The data is sourced from JEN's internal SAP ERP systems. As the data is maintained within internal information systems, it is considered actual information.	**Extract from SAP ERP for calendar year 2017:** **Fuse & Switch Replacement:** JEN extracted PM Orders associated with projects linked to fuses and switches replacement activities (BAA-RHE, RHG, RHH, RHJ, RHL, RHO, RHF, RXF, RXJ, RHI) using IW39	• The Switchgear items were replaced in the year that they were booked to the job.

Variable	Source and why actual	Methodology	Assumptions
VOLTAGE; SWITCH FUNCTION (ASSET REPLACEMENTS)		transaction in SAP ERP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2017 is reported as fuses and switches replaced in 2017. The material description was used to determine the split of switchgear items by these attributes. **Circuit Breaker Replacement:** JEN extracted PM Orders associated with projects linked to CB replacement activities (BAA-RSA) using IW39 transaction in SAP ERP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2017 is reported as circuit breakers replaced in 2017.	
PUBLIC LIGHTING BY: ASSET TYPE; LIGHTING OBLIGATION (ASSET REPLACEMENTS)	The public lighting asset replacements have also been reported in the Public Lighting Tab 4.1. Public Light (luminaire) replacement work is recorded using SAP ERP Notifications. The notification is created against the specific light that requires replacement. Public Lighting Pole replacement work is also recorded using SAP ERP Notifications. The	JEN extracts SAP Notifications linked to public lighting replacement activities (RLJ, RLM, RLN, RLG, RLO) in SAP ERP. The sum of SAP Notifications with start-up date 2017 is reported as public lights replaced in 2017. By extracting the SAP notifications related to specific SAP Public Lighting Codes we can determine the quantity of light replacement activities and categorise them according to Major and Minor Roads.	

Variable	Source and why actual	Methodology	Assumptions
	notification is created against the specific pole that requires replacement. The other source of data is the monthly reports from the public lighting prime contractor. This allows the attributes of the public light such as whether it is located on a Major Road or Minor Road to be analysed and reported on.		
SCADA, NETWORK CONTROL AND PROTECTION SYSTEMS BY: FUNCTION (ASSET REPLACEMENTS)	The data is sourced from JEN's internal SAP ERP systems. As the data is maintained within internal information systems, it is considered actual information.	**Field Devices (Zone Sub Relays & SCADA):** JEN extracted PM Orders associated with projects linked to surge diverter replacement activities (BAA-RCA) using IW39 transaction in SAP ERP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2017 is reported as zone substation relays replaced in 2017. Batteries, chargers and meters are reported under this category. Note: 1). JEN has deliberately put zero for the number of asset replacements in the asset category: Master Station Assets. The reason for this is that expenditure has been incurred as part of a multi-year project to replace JEN's SCADA system (MAT Code: GIS). The volume of replacements will be reported once this project is complete.	The batteries, chargers and meters items were replaced in the year that they were booked to the job.

Variable	Source and why actual	Methodology	Assumptions
OTHER BY: DNSP DEFINED – Surge diverters (EXPENDITURE & ASSET REPLACEMENT)	The data is sourced from JEN's internal SAP ERP systems. As the data is maintained within internal information systems, it is considered actual information.	JEN extracted PM Orders associated with projects linked to surge diverter replacement activities (BAA-RXD, RXE) using IW39 transaction in SAP ERP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2017 is reported as surge diverters replaced in 2017.	The Surge diverter items were replaced in the year that they were booked to the job.

Estimated information

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
POLES BY: HIGHEST OPERATING VOLTAGE ; MATERIAL TYPE; STAKING (IF WOOD) (ASSET REPLACEMENTS)	The expenditure JEN captures in its systems is not recorded at the same level of category as that which is required by the RIN. The information presented is estimated as JEN must split the information recorded in its system into the volume of wood or concrete poles and by voltage (11kV or 22kV).	JEN extracted PM Orders associated with projects linked to Pole Replacement activities (RPL, RPH, RPS) using IW39 transaction in the SAP ERP system. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2017 is reported as poles replaced in 2017. These associated characteristics along with the functional location linked to the relevant PM Order were used to determine the volume of the poles replaced and the category of pole types replaced by classification and voltage.	It is assumed that the unit rate is the same for wood and concrete poles.	JEN deems this to be the best estimate as the expenditure assigned to the Asset category level is based on the most relevant actual data—actual volumes recorded and expenditure assigned to the asset group level in SAP ERP.	JEN 's SAP ERP system will be updated to associate the pole category (whether it is wood or concrete) with the relevant WBS element that records the expenditure.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
POLE TOP STRUCTURES BY: HIGHEST OPERATING VOLTAGE (ASSET REPLACEMENTS)	The expenditure JEN captures in its systems is not recorded at the same level of category as that which is required by the RIN. The information presented is estimated as JEN must split the information recorded in its system into voltage (11kV or 22kV).	JEN extracted PM Orders associated with projects linked to Crossarm Replacement activities (RXL, RXH, RXS) using IW39 transaction in the SAP ERP system. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2017 is reported as crossarms replaced in 2017. The functional locations linked to the PM Orders were used to determine the relevant voltage.	It is assumed that the unit rate is the same for 11kV pole top structures and 22kV pole top structures.	JEN deems this to be the best estimate as the expenditure assigned to the Asset category level is based on the most relevant actual data—actual volumes recorded and expenditure assigned to the asset group level in SAP ERP.	JEN 's SAP ERP system will be updated to associate HV pole top structures (whether it is 11kV or 22kV) with the relevant WBS element that records the expenditure.
SERVICE LINES BY: CONNECTION VOLTAGE; CUSTOMER TYPE; CONNECTION COMPLEXITY (ASSET REPLACEMENT)	The expenditure JEN captures in its systems is not recorded at the same level of category as that which is required by the RIN. The information presented is estimated as JEN must split the information recorded in its system into service type (commercial or residential).	JEN extracted PM Orders associated with projects linked to Services Replacement activities (RMF, RMJ, RML, RMP, RMU) using IW39 transaction in the SAP ERP system. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2017 is reported as services replaced in 2017. The supply point and customer class linked to the equipment number were used to determine the service classification (residential or commercial).	It is assumed that the unit rate is the same for commercial and residential services.	JEN deems this to be the best estimate as the expenditure assigned to the Asset category level is based on the most relevant actual data—actual volumes recorded and expenditure assigned to the asset group level in SAP ERP.	JEN 's SAP ERP system will be updated to associate the service classification (whether it is residential or commercial) with the relevant WBS element that records the expenditure.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
TRANSFORMERS BY: MOUNTING TYPE; HIGHEST OPERATING VOLTAGE ; AMPERE RATING; NUMBER OF PHASES (AT LV) (ASSET REPLACEMENTS)	The expenditure JEN captures in its systems is not recorded at the same level of category as that which is required by the RIN. The information presented is estimated as JEN must split the information recorded in its system into transformer rating types.	JEN extracted PM Orders associated with projects linked to transformer replacement activities (BAA-RHA) using IW39 transaction in SAP ERP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment is used to generate the unit rate which is then applied to the two categories listed under Assumptions for this item. In years where work is done in only one of this categories, this item is transferred to the "Actual information" table above.	This item in the BoP only relates to: – Pole Mounted ; < = 22kV ; < = 60 kVA ; Multiple Phase – Pole Mounted ; < = 22kV ; > 60 kVA and < = 600 kVA ; Multiple Phase	JEN deems this to be the best estimate as the expenditure assigned to the Asset category level is based on the most relevant actual data—actual volumes recorded and expenditure assigned to the asset group level in SAP ERP.	JEN 's SAP ERP system will be updated to associate all transformer rating categories listed in the RIN with the relevant WBS element that records the expenditure.
OTHER BY: DNSP DEFINED – Recoverable works and asset relocation projects (EXPENDITURE & ASSET REPLACEMENT)	Analysis found MAT codes initially assigned to some customer-initiated projects upon establishment did not accurately reflect the scope of works which were later undertaken after more detailed information on the customer's requirements became available. This affected some projects' reported voltage sub-category level (i.e. misallocation between LV and HV).	**Recoverable works and asset relocation projects:** Cost as generated from JEN's SAP ERP system. Costs of the relevant MAT codes are then grouped into the appropriate categories as per type of works: Rectification of Damaged Assets – Recoverable: cost captured under the MAT code of CRB; Customer initiated asset relocation – Major Vic Roads: cost captured under the MAT code of CRV; Customer initiated asset relocation – Undergrounding of Assets: cost captured under the MAT code of CRU;	That the classification of projects to MAT codes is sufficiently accurate to be representative of the actual works undertaken. The number of projects (WBS elements in SAP ERP) are counted to report the Asset Replacement volume.	Allocation is as per project MAT codes and SAP ERP extractions. JEN is unaware of a superior estimation methodology.	The issue which caused the misclassification of projects to the wrong MAT code has been resolved for projects initiated from 2018 onwards by an internal process change. This process change also allows project classification to be amended to the correct MAT code while a project is in flight if the scope of the works

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
		Customer initiated asset relocation – In Line Poles/Stays: cost captured under the MAT code of CRP; Customer initiated asset relocation – Subtransmission Asset: cost captured under the MAT code of CRE; Customer initiated asset relocation – Substation Modification: cost captured under the MAT code of CRS; Customer initiated asset relocation – Intersection Realignment cost captured under the MAT code of CRR			changes after the initial customer inquiry. All projects found to be misclassified were initiated prior to 2018.

2.2.2 SELECTED ASSET CHARACTERISTICS

Actual information

Variable	Source and why actual	Methodology	Assumptions
TOTAL POLES BY FEEDER TYPE OVERHEAD CONDUCTORS BY: CONDUCTOR	All data for these categories are obtained from Template 5.2 - Asset Age Profile.	The total volume was extracted from the system according to its feeder functional location. Feeder functional locations are consistent with the STPIS definition of urban/rural feeders, as per the definitions provided in the RIN.	The assumptions are outlined in the basis of preparation for Template 5.2 – Asset Age Profile. There were no additional assumptions made in determining the asset volumes by asset group.

Variable	Source and why actual	Methodology	Assumptions
LENGTH BY FEEDER TYPE OVERHEAD CONDUCTORS BY: CONDUCTOR LENGTH BY MATERIAL TYPE UNDERGROUND CABLE BY: UNDERGROUND CABLE BY FEEDER TYPE			
(ASSET REPLACEMENTS (all)	To determine the volume of asset replacements by Asset Group, the volume of asset replacement by Asset Category has been used in conjunction with the definition of Rural Short and Urban Feeders. This is possible because the feeder that the replaced asset is connected to is known. The data is sourced from project cost line item reports from JEN's internal SAP ERP systems. JEN had completed upgrading its SAP ERP system in 2017 to improve the reporting capabilities in a number of areas.	The STPIS definitions of a Rural Short and Urban Feeder has been used, consistent with the definitions provided in the RIN. The methodology for determining the asset replacements is documented in the relevant section of this basis of preparation.	The assumption for determining the asset replacements is documented in the relevant section of this basis of preparation.

Variable	Source and why actual	Methodology	Assumptions
	As the data is maintained within internal information systems, it is considered actual information.		
TRANSFORMERS BY: TOTAL MVA – replaced (Asset volumes currently in commission) Total MVA – disposed of (asset volumes currently in commission)	The data is sourced from project cost line item reports from JEN's internal SAP ERP systems. As the data is maintained within internal information systems, it is considered actual information.	The material description, which contains the transformer KVA, rating was used to determine the value for the TOTAL MVA REPLACED for 2017.	The MVA rating of the transformers booked to these jobs equals the MVA rating of the transformers removed.

2.3(A) AUGEX

GENERAL APPROACH

JEN has provided information allocated on a calendar year basis.

In tables 2.3.1 and 2.3.2 where projects are required to be reported on the basis of project close, JEN has reported these in real 2017 dollars. Actual Consumer Price Index (**CPI**) inputs are sourced from the ABS (6401.0 - Consumer Price Index, Australia) with reference to the all groups CPI inflation series A2325846C, which is the weighted average for the eight capital cities. A lagged CPI approach is applied, consistent with the approach applied by the Australian Energy Regulator (**AER**) within JEN's price control mechanism formulas.

Variable	Methodology	Assumptions
Classification of Projects	JEN "Augex" projects are those classified by JEN's SAP project codes beginning with D** (i.e. DOA, DSA, DSH, DSI, DSJ, DSS, DZA, DZC), PRA, PQA and PSA. Augex project costs incurred in 2017 are extracted from SAP. The costs are then classified into the appropriate Augex categories (Table 2.3.4) based on project codes, except DSJ and PQA. Further breakdown and classification of DSJ and PQA projects is undertaken to separate the LV Feeders and Distribution Substation components.	'Other assets' projects were defined as: • Feeder Voltage conversion projects. These projects do not fall into any one category (i.e. they are not standard feeder augmentation projects and involve a mix of distribution substation and HV feeder works). • Communications projects. These do not fall into any one category. For example communications fibre loop does not fall into the RIN definition of zone-substation or HV feeder. JEN considers these assumptions are reasonable to give information for capacity related projects in the categories requested.
Material Projects (over Threshold)	Projects are grouped into the appropriate categories (as described above) before the relevant materiality thresholds are applied, i.e. $5M for zone substation and subtransmission lines, $500k for HV feeders and $50k for LV feeders.	Projects thresholds were applied on total nominal actual expenditure including overheads. For projects that have not been completed (Table 2.3.3.2), total project cost estimated in business case or preliminary cost estimates are used.

Project Close	Project close is determined by project status in SAP, based on a system generated report listing all the projects closed in 2017.	Note that the as incurred expenditure in table 2.3.3.2 will not align with the quantities reported on project close as in 2.3.3.1, and could not be used to form a yearly unit rate as material projects that are not complete will have cost in table 2.3.3.2 but no volume in 2.3.3.1.

2.3.1 AUGEX PROJECT DATA – SUBTRANSMISSION STATIONS, SWITCHING STATIONS AND ZONE SUBSTATIONS

JEN had two material zone substation projects, Broadmeadows South Zone Substation (BMS) and Tullamarine Zone Substation (TMA), which were formally closed in 2017.

Note that there is a time lag between zone substation going into service and project close in JEN's financial system. Both TMA and BMS went into service in 2015, but peripheral capital works continued until the entire projects were completed.

Actual information

Variable	Source and why actual	Methodology	Assumptions
Project Descriptions and Changes	Project information sourced from business case.	N/A	N/A
Transformers, Switchgear, Capacitors (units added, MVA added, MVAR added)	Project information sourced from business case and confirmed with relevant invoice.	N/A	N/A
Total non-material project expenditure	Cost information is extracted from SAP	The sums of annual direct costs of the non-material projects are converted into 2017 dollars using the methodology set out under the General Approach section above.	N/A

Estimated information

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
Transformers (expenditure)	The construction of these two zone substations was outsourced to a contractor in the form of a turnkey solution. These projects (including defining reporting requirements) commenced before the category analysis RIN was released, as a result, JEN does not have detailed category-level actual cost information for these projects (including plant and equipment that was procured by the third party contractor).	The Pricing Schedule of the contractor's tender submission for these 2 zone substations includes component pricing. In this document, a total of 28 types of equipment has been listed under Equipment Procurement. Transformers form 34% (BMS) and 35% (TMA) of the total Equipment Procurement price. These transformer percentages are then applied to actual contract cost attributable to Equipment Procurement[(a)] for the relevant zone substations. *(a):* • *The actual contract cost is sourced from JEN's financial system.* • *The actual contract cost item attributable to Equipment Procurement is guided by prices listed in the Contractor's Pricing Schedule and the logical sequence of works.*	That there is no significant variance between the Pricing Schedule and the amount JEN was invoiced, for example due project variations.	JEN is unaware of a superior estimation methodology.	JEN notes that the reason for providing estimated data has arisen because these projects (including defining reporting requirements) commenced before the category analysis RIN was released. While JEN is taking steps to improve the quality of reporting (as noted below), we are unable to go back and adjust the data retrospectively. Actions JEN is taking include: • Requesting more details in contractor invoices for future works of this type • Improving the capture of invoice data in JEN's SAP system.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
Switchgear (expenditure)	Refer to information noted in the transformers (expenditure) variable.	Switchgear comprises the following equipment: • 66kV Hybrid Switchgear • 66kV Circuit Breakers • 22kV Switchboard and Relays Switchgear forms 25% the total Equipment Procurement price. These switchgear percentages are then applied to actual contract cost attributable to Equipment Procurement[(a)] for the relevant zone substations.	That there is no significant variance between the Pricing Schedule and the amount JEN was invoiced, for example due to project variations.	JEN is unaware of a superior estimation methodology.	Refer to information noted in the transformers (expenditure) variable.
Capacitors (expenditure)	Refer to information noted in the transformers (expenditure) variable.	Capacitors form 2% of the total Equipment Procurement price. These capacitors percentages are then applied to actual contract cost attributable to Equipment Procurement[(a)] for the relevant zone substations.	That there is no significant variance between the Pricing Schedule and the amount JEN was invoiced, for example due to project variations.	JEN is unaware of a superior estimation methodology.	Refer to information noted in the transformers (expenditure) variable.
Other Plant (expenditure)	Refer to information noted in the transformers (expenditure) variable.	The remaining actual contract costs attributable to Equipment Procurement[(a)] for the relevant zone substations.	That there is no significant variance between the Pricing Schedule and the amount JEN was invoiced, for example due to project variations.	JEN is unaware of a superior estimation methodology.	Refer to information noted in the transformers (expenditure) variable.
Installation Labour (expenditure)	Refer to information noted in the transformers (expenditure) variable.	91% (BMS) and 92% (TMA) of Construction and Installation prices (as per the contractor's Pricing Schedule) is attributable to labour. These percentages are applied to actual contract costs in relation to Construction and	That there is no significant variance between the Pricing Schedule and the amount JEN was invoiced, for example due to project variations.	JEN is unaware of a superior estimation methodology.	Refer to information noted in the transformers (expenditure) variable.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
		Installation[(b)] for the relevant zone substations. *(b):* • *The actual contract cost is sourced from JEN's financial system.* • *The actual contract cost item attributable to Construction and Installation is guided by prices listed in Contractor's Pricing Schedule and the logical sequence of works.* Consistent with prior year practice, all SAP generated Direct Labour costs are also reported .			
Installation Labour (volume)	The construction of these two zone substations was outsourced to a contractor in the form of a turnkey solution. Therefore, JEN does not have records of the actual installation labour volumes for these projects.	N/A	N/A	N/A	Refer to information noted in the transformers (expenditure) variable.
Civil works (expenditure)	Refer to information noted in the transformers (expenditure) variable.	The actual contract costs attributable to Civil works for the relevant zone substations, including the : • Contractor's Pricing Schedule in relation to Civil Works • Logical sequence of work.	That there is no significant variance between the Pricing Schedule and the amount JEN was invoiced, for example due to project variations.	JEN is unaware of a superior estimation methodology.	Refer to information noted in the transformers (expenditure) variable.
Other direct (expenditure)	Refer to information noted in the transformers (expenditure) variable.	The remaining direct cost data for the relevant zone substation project as sourced from JEN's financial system.	That there is no significant variance between the Pricing Schedule and the amount JEN	JEN is unaware of a superior estimation methodology.	Refer to information noted in the transformers

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
			was invoiced, for example due to project variations.		(expenditure) variable.
Related party contract cost	JEN does not have detailed category-level actual cost information for these projects.	This refers to costs attributable to the turnkey contract to build both TMA and BMS zone substations. The amounts are sourced from 'Project life-to-date cost by cost element' report. However, the text descriptions do not clearly show these costs being related to the turnkey contract. The total amount has therefore become an estimate.	Assume costs with the text description of 'CONTRACTOR COSTS - NON COGS' are attributable to the turnkey contracts to build BMS and TMA zone substations. Costs reported under this description are of similar magnitude to the itemised prices as listed in Contractor's Tender Submission (Pricing Schedule).	JEN is unaware of a superior estimation methodology.	Refer to information noted in the transformers (expenditure) variable.
Related party margins	JEN does not have access to information about the actual margin earned by contractors in relation to these projects.	The expenditure is estimated to be equal to the expenditure on related party margins for the BMS and TMA zone substation projects which JEN forecast in its 2016-20 reset RIN (submitted to the AER on 30 April 2015).	It is assumed that the forecast expenditure on related party margins for the BMS and TMA zone substation projects in JEN's 2016-20 reset RIN reflects the total actual expenditure on related party margins for these projects.	JEN is unaware of a superior estimation methodology.	Refer to information noted in the transformers (expenditure) variable.
Land and easement	The majority of the costs associated with the purchase of land for BMS and TMA were incurred prior to 2011. JEN's financial system which recorded this expenditure at the time has since been	Forecast expenditure as contained in the relevant project business cases.	The forecast expenditure contained in the relevant business cases (prepared in advance of land procurement) is a valid proxy for the actual land and easement costs.	JEN is unaware of a superior estimation methodology.	N/A – JEN's current financial system captures all detailed cost data post-2011.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
	decommissioned, and JEN's current financial system does not hold detailed financial data prior to 2011.				

2.3.2 AUGEX ASSET DATA – SUBTRANSMISSION LINES

JEN had no subtransmission line, subtransmission line land purchase or easement projects which were closed in 2017.

2.3(B) AUGEX

2.3.3 AUGEX DATA - HV/LV FEEDERS AND DISTRIBUTION SUBSTATIONS

DESCRIPTOR METRICS

Actual information

Variable	Source and why actual	Methodology	Assumptions
HV Feeder Augmentations (volume)	Construction drawings as stored in JEN's drawing management system (DrawBridge).	JEN has obtained the km of overhead conductor and underground cable which were added or upgraded from the construction drawings stored in DrawBridge. Note that the as incurred expenditure in 2.3.3 Cost Metrics will not align with the quantities reported in 2.3.3 Descriptor Metrics, and could not be used to form a yearly unit rate as mentioned above. Also note that material projects that are not complete will have cost in 2.3.3 Cost Metrics but no volume in 2.3.3 Descriptor Metrics.	Thermal uprating and re-conductoring are treated as 'upgrades'. Re-conductoring plus new line added is treated as 'added'.
LV Feeder Augmentations (volume)	Construction drawings as stored in DrawBridge.	JEN has obtained the km of overhead conductor and underground cable which were added or upgraded from the construction drawings stored in DrawBridge. Note that the as incurred expenditure in 2.3.3 Cost Metrics will not align with the	Thermal uprating and re-conductoring are treated as 'upgrades'. Re-conductoring plus new line added is treated as 'added'.

Variable	Source and why actual	Methodology	Assumptions
		quantities reported in 2.3.3 Descriptor Metrics, and could not be used to form a yearly unit rate as mentioned above. Also note that material projects that are not complete will have cost in 2.3.3 Cost Metrics but no volume in 2.3.3 Descriptor Metrics.	
Distribution Substation Augmentations (volume)	Construction drawings as stored in DrawBridge.	JEN has obtained the number of substations of each type which were added or upgraded from the construction drawings stored in DrawBridge. Note that the as incurred expenditure in 2.3.3 Cost Metrics will not align with the quantities reported in 2.3.3 Descriptor Metrics, and could not be used to form a yearly unit rate as mentioned above. Also note that material projects that are not complete will have cost in 2.3.3 Cost Metrics but no volume in 2.3.3 Descriptor Metrics.	Substation replacements, with higher capacity substations, are included in both the added and upgraded volumes.

COST METRICS

Actual information

Variable	Source and why actual	Methodology	Assumptions
HV feeder augmentations (expenditure)	HV feeder projects are assigned the service codes of DSH and DSI. Costs data for these projects are extracted from SAP.	JEN's SAP system does not separately report the overhead and underground cost for HV feeder projects. Therefore, JEN has calculated the percentage split between overhead and underground for each of its material projects based on business case data or cost estimates.	It is assumed that the business case data or cost estimates accurately reflect the actual proportions of underground or overhead expenditure in each project.

Variable	Source and why actual	Methodology	Assumptions
		This percentage split is then applied to the actual project costs incurred in 2017 to determine overhead and underground costs. Note that the as incurred expenditure in 2.3.3 Cost Metrics will not align with the quantities reported in 2.3.3 Descriptor Metrics, and could not be used to form a yearly unit rate as mentioned above. Also note that material projects that are not complete will have cost in 2.3.3 Cost Metrics but no volume in 2.3.3 Descriptor Metrics.	Where there were parts of a project's cost estimate that related to both overhead line and underground augmentation (i.e. design costs), these costs were not used to determine the percentage split. These costs were then allocated to overhead and underground expenditure using the percentage split.
LV feeder augmentations and Distribution Substation Augmentations (expenditure)	JEN assigns the service code DSL to LV Feeders projects and DSJ and PQA to Distribution Substation projects. Cost data for projects with the abovementioned service codes are extracted from SAP.	Most of JEN's LV feeder augmentation works are undertaken as part of the distribution substation augmentation works. Therefore, most DSJ and PQA projects contain both LV feeder and distribution substation augmentation. These are not separately classified in SAP. To separate the components, *'project settlement to asset'* rule recorded in SAP is used. These are the percentages used in capitalising project costs into the different asset class in Fixed Asset Register. For projects without settlement rules recorded in SAP (e.g. projects not yet completed), an estimate has been used. Also, JEN's SAP does not separately report the type of LV feeders (overhead/underground) or the type of distribution substation (pole/ground/indoor). JEN calculated the percentage split between overhead and underground costs for each LV feeder project based on business case data or cost estimates for each project. This percentage split was then applied to the total cost of each LV feeder project to determine the overhead and underground costs.	It is assumed that the business case data or cost estimates accurately reflect the actual proportions of underground or overhead expenditure in each project. Costs settled to transformer are costs incurred for Distribution Substation augmentation. It is assumed that costs settled to all other asset categories are in relation to LV feeder augmentation.

Variable	Source and why actual	Methodology	Assumptions
		For classifying distribution substation type, Geographical Information System data or concept design documents have been used. Note that the as incurred expenditure in 2.3.3 Cost Metrics will not align with the quantities reported in 2.3.3 Descriptor Metrics, and could not be used to form a yearly unit rate as mentioned above. Also note that material projects that are not complete will have cost in 2.3.3 Cost Metrics but no volume in 2.3.3 Descriptor Metrics.	

2.3.4 AUGEX DATA - TOTAL EXPENDITURE

Actual information

Variable	Source and why actual	Methodology	Assumptions
Table 2.3.4 (Expenditure)	Augmentation cost data as extracted from JEN's SAP system and reconciled back to JEN's Annual RIN response.	Augex categorisation was based upon service codes of the projects with the following classification: • DOA – Subtransmission Line; • DSH/DSI – HV Feeder; • DZA/DZC – Zone Substation; • PRA – other augex; and • DSJ/PQA – Distribution Substation and LV Feeders (see notes on Section 2.3.3.2 for more details on how DSJ/PQA project costs are split into Distribution Substation and LV Feeder).	N/A

2.5 CONNECTIONS

2.5.1 DESCRIPTOR METRICS

Actual information

Variable	Source and why actual	Methodology	Assumptions
General comments for connections information	JEN uses its SAP ERP system to capture costs associated with Connections. SAP ERP collects costs based on the activity on which an employee works and the activity to which external costs are associated. These aggregate into Work Breakdown Structures (WBS Elements) (higher level cost collector) which in turn aggregates the costs at a project level. Categorisation is based on activity/service category codes (MAT codes) included in the WBS Elements coding. SAP ERP Master data contains regulatory classification data which is cross-checked against a separate Investment Management System (**IMS**) mapping table. As costs are maintained within internal information systems, they are considered actual information, although some of the sub-categorisation splits are considered estimated as defined throughout this document.	Connection service codes include: • Residential: CDA, CME, CMU, CMV, CMZ • Commercial/Industrial: CBE, CSO, CSU, CBG, CBI, CBK, CBL, CBP, CBS, CBH • Subdivision: CHL, CHH	N/A

Variable	Source and why actual	Methodology	Assumptions
Volumes (0's) • Residential – Underground connections • Residential – Overhead connections • Commercial/Industrial – Underground connections • Commercial/Industrial – Overhead connections • Subdivision – Overhead connections	The source of customer connection information is SAP ISU (AMI) and SAP ERP (non-AMI). This data is based on actual service orders by date, category and service class.	The service orders are created at the time of the connection request. The date, category and service class are confirmed at the completion of the work. The SAP ISU and SAP ERP reports are prepared for new connections completed in the reporting year. The number of connections reported from each system are summated by customer type (Z001=Commercial, Z002=Industrial, Z003=Residential) and service class (OH/UG). The totals of each customer type and service class from the two reports are added together to give the total connections made in the desired reporting year. The overhead connections category for subdivisions is not applicable within JEN's Works Program definition and no work of this nature has been carried out. This volume is therefore zero and considered to be actual information.	N/A
Volumes (MVA added) • Residential – Distribution substation installed • Commercial/industrial – Distribution substations installed • Subdivision – Distribution substation installed	The source of the data is SAP ERP. The data is based on the actual MVA nameplate rating of the substations posted to the SAP ERP projects during the period.	Extract, from SAP ERP, project life to close material posted to connections projects closed in the year. The MVA description is included in the SAP ERP material extract. Added capacity is allocated to each category (residential, commercial/industrial, subdivision) based on each project's WBS Activity Code.	N/A

Variable	Source and why actual	Methodology	Assumptions
Volumes (0's) • Residential – Distribution substations installed • Commercial/Industrial – Distribution substations installed • Subdivision – Distribution substations installed	The source of the data is SAP ERP. The data is based on the actual number of substations posted to the SAP ERP projects during the period.	Extract, from SAP ERP, project life to close material posted to connections projects closed in the year. The MVA description is included in the SAP ERP material extract. Volume of distribution substations added is allocated to each category (residential, commercial/industrial, subdivision) based on each project's WBS Activity Code.	N/A.
Volumes (net circuit km added) • Residential – Augmentation HV	N/A	This category for residential connections is not applicable within JEN's Works Program definition. Therefore, no work of this nature has been carried out and no expenditure has been incurred.	N/A
Expenditure ($) • Residential – Augmentation LV	Cost as generated from JEN's SAP ERP system.	Different types of connection cost are captured under specifically assigned MAT codes. Costs of the relevant MAT codes are then grouped into appropriate categories. For residential customers, the relevant MAT codes are as listed below. All these MAT codes involve minor augmentation on LV network for residential customers only. Therefore, all the costs are then allocated to Residential – Augmentation LV. • CDA • CME • CMU • CMV	N/A

Variable	Source and why actual	Methodology	Assumptions
		• CMZ	
Expenditure ($) • Residential – Distribution substation installed • Residential – Augmentation HV	N/A	These two categories of residential connection (distribution substation installed and augmentation HV) are not applicable within JEN's Works Program definition. Therefore, no work of this nature has been carried out and no expenditure has been incurred.	N/A
Expenditure ($) • Embedded generation – distribution substation installed • Embedded generation – augmentation LV • Embedded generation – augmentation HV	There are no recorded costs incurred for JEN for embedded generation connections.	N/A	N/A
Residential • Volume of GSL breaches for residential customers • GSL payments ($)	Sourced from JEN's internal databases for managing GSL payments.	The volume of GSL breaches and the amounts of payment are collated from the relevant business areas (New Connections and Asset Performance). These data are then validated and summated.	N/A
Residential • Volume of customer complaints relating to connection services	Sourced from JEN's Claims Database.	The volume of customer complaints is from direct contact with the customer. Each customer is assessed prior to being categorised as a complaint.	N/A
Volume (0's) –	The source of customer connection information is SAP ISU (AMI).	Connections were extracted from JEN's SAP ISU system.	N/A

Variable	Source and why actual	Methodology	Assumptions
Residential – Mean days to connect residential customer with LV single phase connection	This data is based on actual service orders by date, category and service class.	An initiated date ('Created on' date) is assigned when the service order is sent via the B2B system. When the service order is physically completed or cancelled, a completed date ('Actual start' date) is assigned. The volume of connections was filtered by customer type ('Connection type') to include only residential customer connections with a single phase connection. The mean days is calculated as the number of days from connection initiation to completion, excluding weekend and public holiday days, averaged over the remaining data set.	
Volumes (0's) • Embedded generation – Underground connections • Embedded generations – Overhead connections	The source of the embedded generation volumes is the SAP ISU EG BI Report. This data is based on actual embedded generation connections by date. The overhead/underground allocation is from JEN's GIS system.	Embedded generation connections are recorded in SAP ISU with the first read date. The GIS Applications team extracted all embedded generators, and their associated NMI and first read date, from SAP ISU (reported using EG BI Report). This report was then filtered on the First Read Date' for the desired year. Details on whether the embedded generator was connected underground or overhead were extracted from GIS by matching the NMI and/or Supply Point ID of EG connections with the LV service class in GIS.	N/A.
Volumes • Embedded generation – Distribution substation installed (MVA)	There are no recorded materials incurred for JEN for embedded generation connections.	N/A	N/A

Variable	Source and why actual	Methodology	Assumptions
• Embedded generation – Distribution substations installed (0's) • Embedded generation – Augmentation HV (net circuit km added) • Embedded generation – Augmentation LV (net circuit km added)			

Estimated information

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
Volumes (0's) • Subdivision – Underground connections	Although the number of pits installed are actual data extracted from SAP ERP, this variable is considered an estimate because the number of connections is assumed to be 1.7 times the number of pits installed. Note the volume of subdivision overhead connections is zero and considered actual information.	The number of connections is estimated based on the actual number of pits installed (using SAP ERP service codes CHH and CHL) multiplied by a factor of 1.7. On average, each pit services 1.7 connections. Refer to variable "Expenditure ($) Subdivision - Cost per lot" in Table 2.5.1 for how this factor is calculated.	The assumption is that each pit will service 1.7 connections.	It is considered to be the best estimate as this represents an average number of connections serviced by each pit over the longer term. JEN is unaware of a superior estimation methodology.	A field has been added in GIS to capture the number of pits per lot and the number of connections the pit is likely to supply and actually supplies. This change was made in 2017 and the number of connections per pit is expected to be reported as actual information for all connections

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
					completed from 2018.
Volumes (net circuit km added) • Residential – Augmentation LV • Commercial/Industrial – Augmentation HV • Commercial/Industrial – Augmentation LV • Subdivision – Augmentation HV • Subdivision – Augmentation LV	Some conductor/cable types are used for both LV and HV. The source of the data is SAP ERP, and SAP ERP is set up to report material based only on conductor/cable type, not specific use. Additionally, JEN does not update SAP ERP at project completion to confirm the actual conductor/cable length added, as opposed to the material posted to SAP ERP projects. Although GIS is the asset database and includes records of conductor/cable lengths installed, there is no relationship between SAP ERP projects and the length/use of conductor/cable installed.	Extract, from SAP ERP, material posted to connection projects closed in the year. The conductor/cable length posted is included the SAP ERP material extract. The material posted was then broken down by conductor/cable type and the length multipliers outlined in the assumptions to estimate the net circuit length added for each category.	It has been assumed that for HV underground cable; • for three core cables, the length of cable used is equal to the circuit length. For single core cable, the circuit length is the length of cable used divided by 3. It has been assumed that for HV overhead conductor; • any conductor less than or equal to 19/2mm and 7/4.50mm would be classified as HV. It has been assumed that for LV underground cable; • for four or two core cables the length of cable used is equal to the circuit length. For single core cable, the circuit length is the length of the cable used divided by four. It has been assumed that for LV overhead conductor; • any conductor other than 19/2mm and 7/4.50mm would be classified as LV.	This is the best estimate because it uses the material that has been allocated to the project to estimate the net circuit km added. JEN is unaware of a superior estimation methodology.	Assign “operating voltage” to the relevant equipment in GIS and pass through to SAP ERP when the equipment record is created / updated on the PM Order. Record the actual volume (length) of the cable or conductor in SAP ERP. Once the operating voltage is added on the equipment, it should appear as a unique character on the Equipment Unit Cost Report and the user will be able to extract the cable length by connection and voltage type.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
Expenditure ($) • Commercial/Industrial - Augmentation LV • Commercial/Industrial - Augmentation HV • Commercial/Industrial - Distribution substation installed	This is an estimate because JEN's system does not capture costs in categories directly in accordance with those set out in the RIN.	Actual connection costs (excluding overheads) captured under the relevant MAT codes are first grouped into the appropriate categories. An estimated cost split derived from a sample of projects (calculated in 2013) is then applied to the actual cost categories calculated in Table 2.5.2. The cost splits are as set below. • C&I augmentation LV is made up of the following: – 100% of *'C&I Simple Connection LV'* costs; and – 9% of *'C&I Complex Connection HV (customer connected at LV)'* costs • C&I augmentation HV is made up of the following: – 18% of *'C&I Complex Connection HV (customer connected at LV)'* costs; and – 100% of *'C&I Complex Connection HV (customer connected at HV)'* costs • C&I distribution substation installed is made up of 73% of *'C&I Complex Connection HV (customer connected at LV)'* costs. Note, there is no cell in Table 2.5.1 matching the definition of 'Commercial/Industrial - Complex connection sub-transmission' in Table	2013 sample remains representative.	This is the best estimate at the time because the method applied is consistent with JEN's SAP ERP activity-based costing system, the application of Connections projects within Works Program definitions and the alignment with RIN definitions.	Extract volume of equipment/asset and characteristics from GIS and add to relevant SAP ERP PM Orders. Ensure "operating voltage" is assigned to the relevant equipment in GIS and SAP ERP when the equipment record is created / updated. Add operating voltage on the existing equipment records in SAP ERP (where missing). Set up a report that joins the data set from the equipment cost report in SAP ERP, relevant MAT code, relevant projects based on MAT code, and aggregates the cost by equipment for each connection category.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
		2.5.2. The total expenditure reported in the two tables is therefore not expected to match where there is 'Commercial/Industrial - Complex connection sub-transmission' project/s expenditure included in Table 2.5.2.			
Expenditure ($) • Subdivision - Augmentation LV • Subdivision - Augmentation HV • Subdivision - Distribution substation installed	This is an estimate because JEN's system does not capture costs in categories directly in accordance with those set out in the RIN.	Actual connection costs (excluding overheads) captured under the relevant MAT codes are first grouped into the appropriate categories. An estimated cost split derived from a sample of projects (calculated in 2013) is then applied to the actual cost categories calculated in Table 2.5.2. The cost splits are as set below. • Subdivision augmentation LV is made up of the following: – 100% of *'Subdivision complex connection LV'* costs; and – 30% of *'Subdivision complex connection HV'* costs. • Subdivision augmentation HV is made up of 40% of *'Subdivision complex connection HV'* costs. • Subdivision distribution substation installed is made up of 30% of *'Subdivision complex connection HV'* costs.	2013 sample remains representative.	This is the best estimate at the time because the method applies is consistent with JEN's SAP ERP activity-based costing system, the application of Connections projects within Works Program definitions and the alignment with RIN definitions. JEN is not aware of a superior estimation technique.	Extract volume of equipment/asset and characteristics from GIS and add to relevant SAP ERP PM Orders. Ensure "operating voltage" is assigned to the relevant equipment in GIS and SAP ERP when the equipment record is created / updated. Add operating voltage on the existing equipment records in SAP ERP (where missing). Set up a report that joins the data set from the equipment cost report in SAP ERP, relevant MAT code, relevant projects based on MAT code, and

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
					aggregates the cost by equipment for each connection category.
Expenditure ($) • Subdivision - Cost per lot	This is an estimate because JEN's system does not capture costs in categories directly in accordance with those set out in the RIN.	This is a simple division of total subdivision costs over the number of connections. The lots per pit factor as determined from the average connections per pit for the period 2009 to 2013. This lots per pit factor was determined by extracting from GIS all of the External Plan References (**XPR**) installed between 2009 and 2013. An XPR is a polygon in the GIS that covers the extents of the design drawing. All underground pits that were inside or touching each XPR were extracted. All underground nominal service cables (the connection between the pit and the supply point (customer meter)) that were inside or touching each XPR were also extracted. All pits and nominal service cables within each polygon were counted, and from the counts we calculated the average number of services supplied from a pit. SAP ERP provides the project category by year and also provides the numbers of pits posted during this period. The average number of services per pit was then used to estimate the number of serviced lots in the year. The cost per lot	It has been assumed that the method to calculate the number of services per pit is representative of the construction in the field (the number of provisional connections is representative of the number of actual connections)	This is JEN's best estimate because it uses the material that has been allocated to the project and the GIS data to be analysed to estimate the number of services connected for the number of pits installed. JEN is unaware of a superior estimation method.	Refer to actions for calculating the number of subdivision connection points. Once the number of serviced lots is known, the total cost of the subdivision (including transformers, HV and LV) divided by the number of lots will provide the cost per lot.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
		is the total cost of the subdivisions (including transformers, HV and LV) divided by the estimated number of lots (provisional connections).			

2.5.2 COST METRICS BY CONNECTION CLASSIFICATION

Actual information

Variable	Source and why actual	Methodology	Assumptions
Expenditure ($) • Residential – Simple connection LV	Cost as generated from JEN's SAP ERP system.	Connection costs (excluding overheads) of different nature are captured under a variety of MAT codes. Costs of the relevant MAT codes are then grouped into the appropriate categories. See notes on Residential Augmentation LV.	N/A
Expenditure ($) • Residential – Complex connection LV • Residential – Complex connection HV	N/A	These two categories of residential connection (complex connection at either LV or HV) are not applicable within JEN's Works Program definition. Therefore, no such work has been carried out and no expenditure of this nature has been incurred.	N/A

Variable	Source and why actual	Methodology	Assumptions
Expenditure ($) • Commercial/Industrial – Complex connection HV (customer connected at HV) • Commercial/Industrial – Complex connection sub-transmission	Cost as generated from JEN's SAP ERP system.	Costs of the relevant MAT codes are then grouped into the appropriate categories. • Commercial – complex connection HV (cust. connected at HV): cost captured under the MAT code of CBH; and • Commercial – connection sub-transmission: cost also captured under MAT code CBH, and separated out on an individual project basis following review of the CBH project list. As noted in Table 2.5.1 of this BoP, there is no cell in Table 2.5.1 matching the definition of 'Commercial/Industrial - Complex connection sub-transmission' in Table 2.5.2. The total expenditure reported in the two tables is therefore not expected to match where there is 'Commercial/Industrial - Complex connection sub-transmission' project/s expenditure included in Table 2.5.2.	N/A
Expenditure ($) • Subdivision – Complex connection HV (with upstream asset works)	N/A	JEN does not have any recorded costs for Subdivision – complex connection HV (with upstream asset works). It is therefore determined that no cost has been incurred for this category.	N/A

Variable	Source and why actual	Methodology	Assumptions
Expenditure ($) • Embedded Generation – Simple connection LV • Embedded Generation – Complex connection HV (small capacity) • Embedded Generation – Complex connection HV (large capacity)	There are no costs recorded in this template for JEN for embedded generation connections. Expenditure for 'Embedded Generation – Simple connection LV' is captured in Template 4.3 under 'Routine connections <100 amps'. Those costs relate to meter reconfigurations and are pooled with other routine connection costs.	N/A	N/A
Volumes (0's) • Residential – Simple connection LV • Residential – Complex connection LV • Residential – Complex connection HV	Volume is taken from SAP ISU and SAP ERP. The volume split (simple, complex, LV, HV etc.) is from SAP ERP, based on service code and customer type for individual projects.	The proportional split of volume is done based on the WBS service code of completed projects within the desired reporting year. Note that the SAP ERP project count does not match the number of connections because most projects cover multiple connections, so the SAP ERP project count is used purely to allocate connections to a particular connection type (simple/complex, LV/HV, etc.). Note there are no recorded connections for residential complex HV or LV connections.	N/A.
Volume (0's) • Commercial/Industrial – Complex connection HV (customer connected at HV) • Commercial/Industrial – Complex connection sub-transmission	Volume is taken from SAP ERP, based on projects with service code CBH. A separate WBS project number is established for each customer connection, so there is one-to-one relationship between the number of HV projects in SAP ERP and the number HV connections. Sub-transmission projects are included under the CBH service code.	The volume of completed projects within the desired year with WBS service code of CBH are extracted from SAP ERP. The SAP ERP project count matches the number of HV connections, including sub-transmission connections. The number of sub-transmission connections (where applicable) are manually separated from the total CBH count based on engineering knowledge of the project type.	N/A

Variable	Source and why actual	Methodology	Assumptions
Volumes (0's) • Embedded Generation – Simple connection LV • Embedded Generation – Complex connection HV (small capacity) • Embedded Generation – Complex connection HV (large capacity)	The source of the embedded generation volumes is the SAP ISU EG BI Report. This data is based on actual embedded generation connections by date. The overhead/underground allocation is from JEN's GIS system.	Embedded generation connections are recorded in SAP ISU with the first read date. The GIS Applications team extracted all embedded generators, and their associated NMI and first read date, from SAP ISU (reported using EG BI Report). This report was then filtered on the First Read_Date' for the desired year. Details on whether the embedded generator was connected underground or overhead were extracted from GIS by matching the NMI and/or Supply Point ID of EG connections with the LV service class in GIS.	N/A
Volumes (0's) • Subdivision – Complex connection HV (with upstream asset works)	There are no upstream works associated with subdivision connections as upstream works are undertaken separately as a network augmentation prior to any subdivision.	N/A	N/A

Estimated information

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
Expenditure ($) • Commercial/Industrial – Simple connection LV	Analysis found MAT codes initially assigned to some customer-initiated projects upon establishment did not accurately reflect the scope of works which were later	Cost as generated from JEN's SAP ERP system. Costs of the relevant MAT codes are then grouped into the appropriate categories.	That the classification of projects to MAT codes is sufficiently accurate to be representative of the actual works undertaken.	Allocation is as per project MAT codes and SAP ERP extractions. JEN is unaware of a superior estimation methodology.	The issue which caused the misclassification of projects to the wrong MAT code has been resolved for projects initiated from 2017 onwards by an internal process change. This process change allows project classification to be amended to the correct MAT code while a

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
	undertaken after more detailed information on the customer's requirements became available. This affected some projects' reported voltage sub-category level (i.e. misallocation between LV and HV).	• Commercial – simple connection LV: sum of the costs captured in the MAT codes of CBE, CSO and CSU.			project is in flight if the scope of the works changes after the initial customer inquiry. All projects found to be misclassified were initiated prior to 2017.
Expenditure ($) • Commercial/Industrial – Complex connection HV (customer connected at LV, minor HV works) • Commercial/Industrial – Complex connection HV (customer connected at LV, upstream asset works)	This data is reported as an estimate rather than an actual because JEN does not use specific activity codes within SAP ERP to differentiate between minor HV works and upstream asset works.	It is estimated that 80% of expenditure falls under Complex Connection HV (customer connected at LV, minor HV works) and 20% of expenditure falls under Complex connection HV (customer connected at LV, upstream asset works). This estimate is formed based on an engineering judgment.	The assumption is that the 80/20 split used is a close approximation of the actual split of costs based on engineer knowledge.	This is the best estimate available with the information currently collected in SAP ERP. JEN is unaware of a superior estimation methodology.	As for Table 2.5.1 to obtain the volume and costs by connection and voltage to distinguish HV and LV connections. Internal process updates to ensure project managers create separate work orders for the various sub-categories and segregate the work order based on the nature of the work to capture costs and volumes in the relevant sub-categories. From information stored on the NMI (stored in SAP ISU), the customer connection can be classified as simple or complex. The volumes of the connection
Volume (0's)	Although the number of	The total number of connections has been	The assumption is that the number of projects in each	This is the best estimate available with the information	

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
• Commercial/Industrial – Simple connection LV • Commercial/Industrial – Complex connection HV (customer connected at LV, minor HV works) • Commercial/Industrial – Complex connection HV (customer connected at LV, upstream asset works) •	commercial/industrial connections is an actual extracted from SAP ISU and SAP ERP, the proportional split between the subcategories is an estimate because there is no relationship between the total connection volume and these commercial/industrial subcategories.	allocated between subcategories according to proportional expenditure attributed to each subcategory.	activity code is representative of the number of connections performed under each sub category.	currently collected in the SAP ISU and SAP ERP systems. JEN is unaware of a superior estimation methodology.	by type will be extracted from SAP ISU. The NMI information can be added to GIS which stores the information of the assets per project. Develop a BI report that takes the data set from SAP ISU (NMI information), asset details from GIS and costs per connection by voltage type from SAP ERP. The issue which caused the misclassification of projects to the wrong MAT code has been resolved for projects initiated from 2017 onwards by an internal process change. This process change also allows project classification to be amended to the correct MAT code while a project is in flight if the scope of the works changes after the initial customer inquiry. All projects found to be misclassified were initiated prior to 2017.
Expenditure ($) • Subdivision – Complex connection LV • Subdivision – Complex connection HV (no upstream asset works)	Analysis found MAT codes initially assigned to some customer-initiated projects upon establishment did not accurately reflect the scope of works which were later undertaken after more detailed information on the customer's requirements became available. This affected some	Cost as generated from JEN's SAP ERP system. Costs of the relevant MAT codes are then grouped into the appropriate categories. • Subdivision – complex connection LV: cost captured under the MAT code of CHL; • Subdivision – complex	That the classification of projects to MAT codes is sufficiently accurate to be representative of the actual works undertaken.	Allocation is as per project MAT codes and SAP ERP extractions. JEN is unaware of a superior estimation methodology.	

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
	projects' reported voltage sub-category level (i.e. misallocation between LV and HV).	connection HV (no upstream asset works): cost captured under the MAT code of CHH			
Volumes (0's) • Subdivision – Complex connection LV • Subdivision – Complex connection HV (no upstream asset works)	Although the number of pits installed are actual data extracted from GIS, these two variables are considered an estimate because the number of connections are assumed to be 1.7 times the number of pits installed.	The number of connections is estimated based on the actual number of pits installed (using GIS and SAP ERP service codes CHH and CHL) multiplied by a factor of 1.7 connections per pit. On average, each pit services 1.7 connections. Refer to variable "Expenditure ($) Subdivision - Cost per lot" in Table 2.5.1 for how this factor is calculated. SAP ERP service code CHL represents "Subdivision - Complex connection LV", and CHH represents "Subdivision - Complex connection	It is assumed that each pit will service 1.7 connections. This assumption is determined from the average connections per pit for the period 2009 to 2013.	It is considered to be the best estimate as this represents an average number of connections serviced by each pit over the longer term, which is more useful for the benchmark unit price. JEN is unaware of a superior estimation methodology.	

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
		HV (no upstream asset works)".			

2.6 NON-NETWORK

2.6.1 NON-NETWORK EXPENDITURE

Actual information

Variable	Source and why actual	Methodology	Assumptions
2.6.1 IT and Communications **Capex**	This information is considered actual information as it is sourced directly from SAP, the internal Enterprise Resource Planning (**ERP**) system that JEN uses to capture its financial and other information. Project Maintenance Orders (**PM orders**) that aggregate into Work Breakdown Structures (**WBS Elements**) (cost collectors) are set up to collect costs at a project level. These PM orders are designed to collect costs based on the activity on which an employee works and to accept any external costs associated with that order. WBS element codes are also designed to identify most of the regulatory categories. JEN uses time writing functionality to capture internal labour costs. Where practical and appropriate, all employees time write to a PM orders or to a client e.g. JEN. These form one of the direct costs incurred for a WBS element.	The cost of IT and Communications capex is derived from extracting financial transactions from SAP. A standard project cost report for the calendar year discloses the IT and Communications capex costs. The activity codes with its respective costs that align to the IT and Communications category are listed on the report. The Project Management Office (**PMO**) team maintains a spreadsheet of projects that determines the classification of costs to 'Client Device', 'Recurrent' and 'Non-Recurrent' categories.	n/a
2.6.1 Motor Vehicles **Capex**	This information is considered actual information as it is sourced directly from SAP. PM orders that aggregate into WBS Elements (cost collectors) are set up to collect costs at	Motor Vehicle capital expenditure is derived from cost of purchases that are good receipted directly against JEN issued purchase orders. These costs	n/a

Variable	Source and why actual	Methodology	Assumptions
	project level. These PM orders are designed to collect costs based on the activity on which an employee works and to accept any external costs associated with that order. WBS element codes are also designed to identify most of the regulatory categories. JEN uses time writing functionality to capture internal labour costs. Where practical and appropriate, all employees time write to a PM orders or to a client e.g. JEN. These form one of the direct costs incurred for a WBS element.	are categorised against a particular type of asset class e.g. Motor Vehicles. An Asset Acquisitions report is run in SAP, filtered for the motor vehicle asset classes, that lists all the purchases made during the calendar year. The report provides details of the motor vehicle asset numbers, acquisition amounts, acquisition date, and asset description. JEN's Fleet Management team assigns the costs by referring to the unique asset numbers listed on the report to determine the classification of costs to 'Car', 'Light-Commercial Vehicle', 'Elevated Work Platform (LCV)', Elevated Work Platform (HCV)' and 'Heavy Commercial Vehicle' categories.	

Variable	Source and why actual	Methodology	Assumptions
2.6.1 Buildings and Property **Capex**	This information is considered actual information as it is sourced directly from SAP PM orders that aggregate into Work Breakdown Structures WBS Elements (cost collectors) are set up to collect costs at project level under a defined activity of work (**Activity**). These PM orders are designed to collect costs based on the activity on which an employee works and to accept any external costs associated with that order. WBS element codes are also designed to identify most of the regulatory categories. JEN uses time writing functionality to capture internal labour costs. Where practical and appropriate, all employees time write to a PM orders or to a client e.g. JEN. These form one of the direct costs incurred for a WBS element.	The cost of Buildings and Property capex is derived from extracting financial transactions from SAP. A standard project cost report for the calendar year discloses the Buildings and Property costs. The activity codes and respective costs that align to property costs are listed on the report. The activity codes used in projects determine the classification of costs to this category.	n/a
2.6.1 Other **Capex**	This information is considered actual information as it is sourced directly from SAP PM orders that aggregate into WBS Elements (cost collectors) are set up to collect costs at project level under a defined activity of work. These PM orders are designed to collect costs based on the activity on which an employee works and to accept any external costs associated with that order. WBS element codes are also designed to identify most of the regulatory categories. JEN uses time writing functionality to capture internal labour costs. Where practical and appropriate, all employees time write to a PM	This variable reflects miscellaneous equipment purchases such as trailers and small equipment items such as tools that are not classified as either 'IT and Communications', 'Motor Vehicles', or 'Buildings and Property'. The 'Other' capex costs derived from extracting financial transactions from SAP for tools and other equipment. A standard project cost report for the calendar year discloses these costs. The activity codes and respective costs that align to 'Other' costs are listed on the report. The activity codes used in projects determine the classification of costs to this category.	n/a

Variable	Source and why actual	Methodology	Assumptions
	orders or to a client e.g. JEN. These form one of the direct costs incurred for a WBS element.		
2.6.1 IT and Communications **Opex** ***Non-Recurrent Expenditure***	This information is considered actual information as it is sourced directly from SAP. PM orders that aggregate into WBS Elements (cost collectors) are set up to collect costs at project level under a defined activity of work. These PM orders are designed to collect costs based on the activity on which an employee works and to accept any external costs associated with that order. WBS element codes are also designed to identify most of the regulatory categories. JEN uses time writing functionality to capture internal labour costs. Where practical and appropriate, all employees time write to a PM orders or to a client e.g. JEN. These form one of the direct costs incurred for a WBS element.	Consist of new IT systems being implemented for the first time or one-off type expenditure. This conforms to the AER definition which is as follows: *"Non-recurrent expenditure is likely to include projects, particularly major projects that are one off and not ongoing in nature (e.g. major IT or Communications systems upgrades)."* The cost of IT and Communications Non-Recurrent opex is derived from extracting financial transactions from SAP. A standard project cost report for the calendar year discloses the IT and Communications opex costs. The activity codes and respective costs that align to IT and Communications costs are listed on the report. The project definition determines the classification of costs as 'Non-Recurrent' category.	n/a

Variable	Source and why actual	Methodology	Assumptions
2.6.1 Buildings and Property **Opex**	This information is considered actual information as it is sourced directly from SAP. PM orders that aggregate into WBS Elements (cost collectors) are set up to collect costs at project level under a defined activity of work. These PM orders are designed to collect costs based on the activity on which an employee works and to accept any external costs associated with that order. WBS element codes are also designed to identify most of the regulatory categories. JEN uses time writing functionality to capture internal labour costs. Where practical and appropriate, all employees time write to a PM orders or to a client e.g. JEN. These form one of the direct costs incurred for a WBS element.	Jemena Corporate properties are office properties in Victoria and NSW that are owned or leased by the Company to be used as Corporate Head-Offices for its office-based workforce in the respective states. Jemena allocates costs to JEN based on the numbers of seats in each building allocated to Functional Groups; and then for each Functional Group in each state (VIC, NSW), their teams' split of activities factored across the assets. Direct costs like Property tax & Council rates are collected against each asset. The cost of Buildings and Property opex is derived from extracting financial transactions from SAP. A standard project cost report for the calendar year discloses the Buildings and Property costs. The activity codes and respective costs that align to property costs are listed on the report. The activity codes used in projects determine the classification of costs to this category.	n/a

Estimated information

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual information in future
2.6.1 IT and Communications **Opex** ***Client Devices***	This information is sourced from SAP. SAP does not capture data in the detailed categories required by the RIN. A management estimate	Jemena has an IT Services Cost Model which records all IT opex items. The model is used to allocate these costs	JEN assumes that client device expenditure is consistent year on year as a percentage of overall recurrent IT expenditure. JEN also assumes that the	JEN is not aware of a superior estimation technique.	JEN is currently undertaking a project (consistent with that which it proposed in its 2016-20 regulatory proposal) to identify and implement actions necessary to report actual information in the future.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual information in future
	for this category has been provided.	over its business units based on various cost drivers. The level of detail necessary to distinguish between Recurrent and Client Device expenditure has not been recorded. Therefore, JEN's experienced IT personnel make the assumption that all recurrent IT opex that is estimated as Client Device related are to be classified under this category.	cost incurred from the period Jul 2012 to Jun 2013 is representative of the split.		JEN in planning to make system enhancements to allow the recording of IT opex types as per the prescribed categories (i.e. recurrent, non-recurrent, client device expenditure), however will also need to implement process changes to empower its relevant staff with the knowledge to understand and record expenditure against these activity classifications, thereby removing the need to use judgement. JEN will continue to improve the process of capturing the costs in the relevant regulatory category.
2.6.1 IT and Communications **Opex** ***Recurrent Expenditure***	This information is sourced from SAP. SAP does not capture data in the detailed categories required by the RIN. A management estimate for this category has been provided.	Jemena has an IT Services Cost Model which records all IT opex items. The model is used to allocate these costs over its business units based on various cost drivers. The level of detail necessary to distinguish between Recurrent and Client Device expenditure has not been recorded. Therefore, JEN's experienced IT personnel make the assumption that all recurrent IT opex, excluding Client Devices and Non-Recurrent, are to be classified under this category.	JEN assumes that recurrent expenditure (excluding client device expenditure) is consistent year on year as a percentage of overall recurrent IT expenditure. JEN also assumes that the cost incurred from the period Jul 2012 to Jun 2013 is representative of the split.	JEN is not aware of a superior estimation technique.	JEN is currently undertaking a project (consistent with that which it proposed in its 2016-20 regulatory proposal) to identify and implement actions necessary to report actual information in the future. JEN in planning to make system enhancements to allow the recording of IT opex types as per the prescribed categories (i.e. recurrent, non-recurrent, client device expenditure), however will also need to implement process changes to empower its relevant staff with the knowledge to understand and record expenditure against these activity classifications, thereby removing the need to use judgement.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual information in future
					JEN will continue to improve the process of capturing the costs in the relevant regulatory category.

2.6.1 Motor Vehicles **Opex**	The total cost information is sourced from SAP. SAP does not capture data in the detailed categories required by the RIN. A new online fleet cost management system was implemented in October 2017. JEN used 3 months of actual cost data from the online fleet cost management system to establish vehicle sub-category weightings, and applied these weightings to categorise the total cost stack downloaded from SAP into the RIN sub-categories.	JEN's fleet expenditure includes costs such as vehicle registration fees, insurance, fuel, tolls, service and maintenance and smash repair costs. The costs are derived from extracting financial transactions from SAP. Specific general ledger accounts are used to capture the fleet costs. Using these general ledger accounts as key parameters, costs are extracted from SAP using a standard report. *Allocation of Operating Expenditure to the various Motor Vehicle categories:* A new online fleet cost management system was implement in October 2017. JEN used 3 months of actual cost data from the online fleet cost management system to establish sub-category weightings and applied these weightings to categorise the total cost stack downloaded from SAP into the RIN sub-categories.	JEN has made the assumption that the sub-category spending weightings for the 3 months October to December 2017 are representative of the total annual costs.	JEN is not aware of a superior estimation technique.	JEN is currently undertaking a project (consistent with that which it proposed in its 2016-20 regulatory proposal) to identify and implement actions necessary to report actual information in the future.

2.6.1 Other **Opex**	"Other" expenditure relates to tools expenditure and fleet items (e.g. trailers) which do not align with the Motor Vehicles Opex sub-classifications. The total cost information is sourced from SAP. SAP does not capture data in the detailed categories required by the RIN. A new online fleet cost management system was implement in October 2017. JEN used 3 months of actual cost data from the online fleet cost management system to establish vehicle sub-category weightings and applied these weightings to categorise the total cost stack downloaded from SAP into the RIN sub-categories.	The costs are derived by extracting financial transactions from SAP. Specific general ledger accounts are used to capture the fleet costs. Using these general ledger accounts as key parameters, costs are extracted from SAP using a standard report. *Allocation of Operating Expenditure to the various Motor Vehicle categories:* A new online fleet cost management system was implement in October 2017. JEN used 3 months of actual cost data from the online fleet cost management system to establish sub-category weightings and applied these weightings to categorise the total cost stack downloaded from SAP into the RIN sub-categories. In prior years Motor Vehicle costs were allocated based on km travelled by subcategories therefore explaining why there was $nil allocated to 'Other' in the prior year.	JEN has made the assumption that the sub-category spending weightings for the 3 months October to December 2017 are representative of the total annual costs	JEN is not aware of a superior estimation technique.	JEN is currently undertaking a project (consistent with that which it proposed in its 2016-20 regulatory proposal) to identify and implement actions necessary to report actual information in the future.

2.6.2. ANNUAL DESCRIPTOR METRICS – IT & COMMUNICATIONS EXPENDITURE

Actual information

Variable	Source and why actual	Methodology	Assumptions
2.6.2 **Employee Numbers**	This information is considered actual information as it is sourced directly from the employee numbers reported under Template 2.11 Labour.	The employee numbers reported under this template are sourced from Template 2.11 Labour. Please refer to the basis of preparation of template 2.11.	n/a
2.6.2 **User Numbers**	This information is considered actual information as the user numbers reported under this template are those employees who use a device (devices as described below).	All employees are given access to the corporate network and communications systems. Field staff have a number of ways to remotely access corporate applications when they are away from Jemena offices. An active list of employees that have access to any device described below is maintained. The number of employees listed as having access is considered users under this category.	n/a
2.6.2 **Number of Devices**	Number of devices reported in this template is the actual figures for the reporting period. The figure reported is a composite of all of the following maintained in the list of devices and users: • Personal computers (laptop and desktop) • Tablets • Smartphones	The number of devices reported in this template for desktops, laptops, tablet machines and smartphones are derived from the active list of devices and users maintained..	n/a

Estimated information

No estimated information is provided.

2.6.3 ANNUAL DESCRIPTOR METRICS – MOTOR VEHICLES

Actual information

Variable	Source and why actual	Methodology	Assumptions
2.6.3 **CAR** **Average Kilometres Travelled**	A Monthly Fuel Usage and odometer readings Report provided by the Fleet Management Company contracted by Jemena.	Data is sourced from the Fleet Management company fuel data reports - based on the fuel card usage. This report identifies each vehicle by registration number and records the kilometre readings at the time of fuel refill. The report includes the Vehicle Reference (which is used to allocate the readings to the various motor vehicle categories of this RIN) the business unit and location. The report is in a rolling data format and retains kilometre readings for the previous 12 months. The annual kilometres are derived by subtracting the beginning of January reading from the end December reading for each vehicle, and then dividing the total kilometres by the number of vehicles for the car category. Therefore, the average kilometres for this category are derived directly from this report.	n/a
2.6.3 **CAR** **Number Purchased**	This information is considered actual information as it is sourced directly from SAP.	An Asset Acquisitions report was run to extract the data and lists all the purchases made for the Motor Vehicles asset class within the calendar year. This report details the asset numbers, acquisition amounts, acquisition dates and asset descriptions and used to calculate the number of cars purchased.	n/a
2.6.3 **CAR** **Number Leased**	n/a Jemena's fleet is owned, not leased.	n/a	n/a

Variable	Source and why actual	Methodology	Assumptions
2.6.3 **CAR** **Number in Fleet**	A monthly fuel usage report provided by the Fleet Management Company contracted by Jemena.	The number in fleet was calculated by referring to the "Summary of vehicles" identified as 'Active' on the monthly fuel card usage report.	n/a
2.6.3 **CAR** **Proportion of Total Fleet Expenditure**	All fleet expenditure is allocated as regulatory expenditure, and therefore the proportion of total fleet expenditure is 100%.	n/a	n/a
2.6.3 **LIGHT COMMERCIAL VEHICLE** **Average Kilometres Travelled**	A Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena.	This report identifies each vehicle by registration number and records the kilometre readings at the time of fuel fill. The report includes the Vehicle Reference (which is used to allocate the readings to the various motor vehicle categories of this RIN), the business unit and location. The report is in a rolling data format and retains kilometre readings for the previous 12 months. The annual kilometres were derived by subtracting the beginning of January reading from the end December reading for each vehicle, and then dividing the total kilometres by the number of vehicles for the Light Commercial Vehicle category. Therefore, the average kilometres for this category were derived directly from this report.	n/a
2.6.3 **LIGHT COMMERCIAL VEHICLE**	This information is considered actual information as it is sourced directly from SAP.	An Asset Acquisitions report is run to extract the data and lists all the purchases made under the Motor Vehicles asset class within the calendar year. This report details the asset numbers, acquisition amounts, and acquisition dates and asset	n/a

Variable	Source and why actual	Methodology	Assumptions
Number Purchased		descriptions and used to calculate the number of Light Commercial Vehicles purchased.	
2.6.3 **LIGHT COMMERCIAL VEHICLE** **Number Leased**	n/a Jemena's fleet is owned, not leased.	n/a	n/a
2.6.3 **LIGHT COMMERCIAL VEHICLE** **Number in Fleet**	A Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena.	The number in fleet was calculated by referring to the "Summary of vehicles" identified as 'Active' on the monthly fuel card usage report.	n/a
2.6.3 **LIGHT COMMERCIAL VEHICLE** **Proportion of Total Fleet Expenditure**	All fleet expenditure is allocated as regulatory expenditure, and therefore the proportion of total fleet expenditure is 100%.	n/a	n/a
2.6.3 **ELEVATED WORK PLATFORM (LCV)**	n/a This is not a type of equipment used by JEN.	n/a	n/a

Variable	Source and why actual	Methodology	Assumptions
Average Kilometres Travelled			
2.6.3 **ELEVATED WORK PLATFORM (LCV) Number Purchased**	n/a This is not a type of equipment used by JEN.	n/a	n/a
2.6.3 **ELEVATED WORK PLATFORM (LCV) Number Leased**	n/a This is not a type of equipment used by JEN.	n/a	n/a
2.6.3 **ELEVATED WORK PLATFORM (LCV) Number in Fleet**	n/a This is not a type of equipment used by JEN.	n/a	n/a
2.6.3 **ELEVATED WORK PLATFORM (LCV)**	n/a This is not a type of equipment used by JEN.	n/a	n/a

Variable	Source and why actual	Methodology	Assumptions
Proportion of Total Fleet Expenditure			
2.6.3 **ELEVATED WORK PLATFORM (HCV)** **Average Kilometres Travelled**	The information is sourced from a Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena. JEN considers the information to be actual information given that the data is maintained within JEN's internal reporting systems.	Data is sourced from the Fleet Management company fuel data reports based on the fuel card usage. This report identifies each vehicle by registration number and records the kilometre readings at the time of fuel fill. The report includes the Vehicle Reference (which is used to allocate the readings to the various motor vehicle categories of this RIN), the business unit and location. The report is in a rolling data format and retains kilometre readings for the previous 12 months. The annual kilometres were derived by subtracting the beginning of January reading from the end December reading for each vehicle, and then dividing the total kilometres by the number of vehicles for the Elevated Work Platform (HCV) category. Therefore, the average kilometres for this category are derived directly from this report.	n/a
2.6.3 **ELEVATED WORK PLATFORM (HCV)** **Number Purchased**	This information is considered actual information as it is sourced directly from SAP.	An Asset Acquisitions report is run to extract the data and lists all the purchases made for the Motor Vehicle asset classes within the calendar year. This report details the asset numbers, acquisition amounts, acquisition dates and asset descriptions, and used to calculate the number of HCV's purchased.	n/a
2.6.3	n/a Jemena's fleet is owned, not leased.	n/a	n/a

Variable	Source and why actual	Methodology	Assumptions
ELEVATED WORK PLATFORM (HCV) **Number Leased**			
2.6.3 **ELEVATED WORK PLATFORM (HCV)** **Number in Fleet**	The information is sourced from a Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena. JEN considers the information to be actual information given that the data is maintained within JEN's internal reporting systems.	The number in fleet is calculated by referring to the "Summary of vehicles" identified as 'Active' on the monthly fuel card usage report.	n/a
2.6.3 **ELEVATED WORK PLATFORM (HCV)** **Proportion of Total Fleet Expenditure**	All fleet expenditure is allocated as regulatory expenditure, and therefore the proportion of total fleet expenditure is 100%.	n/a	n/a
2.6.3 **HEAVY COMMERCIAL VEHICLE** **Average Kilometres Travelled**	The information is sourced from a Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena. JEN considers the information to be actual information given that the data is maintained within JEN's internal reporting systems.	Data is sourced from the Fleet Management company fuel data reports based on fuel card usage. This report identifies each vehicle by registration number and records the kilometre readings at the time of fuel fill. The report includes the Vehicle Reference (which is used to allocate the readings to the various motor vehicle categories of this RIN), the business unit and location. The report is in a rolling data format and retains kilometre readings for the previous 12 months. The annual kilometres are derived by subtracting the beginning of January	n/a

Variable	Source and why actual	Methodology	Assumptions
		reading from the end December reading for each vehicle, and then dividing the total kilometres by the number of vehicles for the Heavy Commercial Vehicle category. Therefore, the average kilometres for this category are derived directly from this report.	
2.6.3 **HEAVY COMMERCIAL VEHICLE** **Number purchased**	The information is sourced from a Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena. JEN considers the information to be actual information given that the data is maintained within JEN's internal reporting systems.	No acquisitions in the reporting period.	n/a
2.6.3 **HEAVY COMMERCIAL VEHICLE** **Number Leased**	n/a Jemena's fleet is owned, not leased.	n/a	n/a
2.6.3 **HEAVY COMMERCIAL VEHICLE** **Number in Fleet**	A Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena. JEN considers the information to be actual information given that the data is maintained within JEN's internal reporting systems.	The number in fleet is calculated by referring to the "Summary of vehicles" identified as 'Active' on the monthly fuel card usage report.	n/a

Variable	Source and why actual	Methodology	Assumptions
2.6.3 **HEAVY COMMERCIAL VEHICLE** **Proportion of Total Fleet Expenditure**	All fleet expenditure is allocated as regulatory expenditure, and therefore the proportion of total fleet expenditure is 100%.	n/a	n/a

Estimated information

No estimated information is provided.

2.7 VEGETATION MANAGEMENT

2.7.1 DESCRIPTOR METRICS BY ZONE

Actual information

Variable	Source and why actual	Methodology	Assumptions
Low Bushfire Risk Area (**LBRA**) and Hazardous Bushfire Risk Area (**HBRA**), Route line length within zone (km) for "Urban and CBD" and "Rural" feeders	Jemena's Geographical Information (**GIS**) is the single source of actual data for route line length. The data is extracted directly from the GIS at the end of 2017. The data extracted from GIS was provided with identifiers for two zone and two feeder categories.	A program has been developed within the GIS to determine the route length of the network. The methodology used was to determine where there were single circuits between poles and where there were multiple circuits between poles. Where there are multiple circuits the span length between poles has only been included once. The span length of the single circuits has then been added to determine the total route length. Computer code is written to extract six files, they are: 1. List of all LV overhead mains spans (From poles and To pole) by feeder and in the LBRA 2. List of all HV overhead mains spans in the LBRA 3. List of all overhead ST spans in the LBRA Files 4, 5 and 6 are the same but for spans in the HBRA. These six files are then combined and duplicate spans (From poles and To pole) are eliminated from the list. The resultant list contains only unique spans which are allocated to a feeder giving the	Only overhead conductor route length was to be considered, that is underground cable route length was excluded. Length of overhead services from poles to premises was excluded from the route length calculation. All conductor recorded as Usage "service" is not included in this variable.

Variable	Source and why actual	Methodology	Assumptions
		ability to split the data between Urban and Rural feeders. The GIS records information against every pole enabling the split between LBRA and HBRA. As specified in the RIN, service lines are not included in this variable. The length of any underground cable is also not included here.	
LBRA and HBRA, Number of maintenance spans (0's) for "Urban and CBD" and "Rural" feeders	This variable is reported as actual information for 2017 as the data is directly sourced from the Vegetation Management System (**VMS**). The data is collected in the field and entered into data collection devices and is then loaded into the VMS. Reports are run directly from the VMS.	The data collected in the field and loaded into the vegetation management company's VMS includes the feeder that the span is connected to (thus allowing it to be determined whether the feeder is rural or urban), and whether the span is in a HBRA or LBRA.	It is assumed that "active vegetation management practices" defined in the RIN for "Vegetation Maintenance Span" means: a span to which a crew was dispatched to cut or remove a tree for electric line clearance purposes during the calendar year.
LBRA and HBRA, Length of vegetation corridors (km) for "Urban and CBD" and "Rural" feeders	JEN has no recorded vegetation corridors.	If JEN had any vegetation corridors they would be recorded in the VMS.	No assumptions have been made in providing this information.
LBRA and HBRA, Average number of trees per maintenance span (0's) for "Urban and CBD" and "Rural" feeders	This variable is reported as actual information for 2017 as the data is directly sourced from VMS. The data is collected in the field and entered into data collection devices and is then loaded into the VMS.	The data collected in the field and loaded into the vegetation management company's VMS includes the number of trees maintained per maintenance span. Reports are run directly from the VMS.	No assumptions have been made in providing this information.
LBRA and HBRA, Average frequency of cutting cycle (years) for "Urban and CBD" and "Rural" feeders	This variable is reported as actual information for 2017 because the data can be directly sourced from the 2017 annual Jemena Electric Line Clearance Management Plan (**ELCMP**).	There is no methodology to be applied to this response. The information is simply maintained within the ELCMP for 2017.	No assumptions have been made in providing this information.

Variable	Source and why actual	Methodology	Assumptions
LBRA and HBRA, Total length of maintenance spans (km) for “Urban and CBD” and “Rural” feeders	Jemena’s Geographical Information (**GIS**) is the single source of actual data for the span length. The data is extracted directly from the GIS at the end of 2017. The data extracted from GIS was provided with identifiers for two zone and two feeder categories. Spans maintained data is entered into GIS from field records captured in VMS.	A standard report is available in GIS, which when run, generates a list of all maintained spans and related span lengths which have been identified in the field as maintained for vegetation management purposes. This report includes a summation indicating the total length of spans maintained for the calendar year.	No assumptions have been made in providing this information.

Estimated information

No estimated information is provided.

2.7.2 EXPENDITURE METRICS BY ZONE

Response to additional requirements in the RIN under section 12 VEGETATION MANAGEMENT EXPENDITURE

Specifically for item “12.7 for each vegetation management zone identified in 12.1 above, provide in the basis of preparation:”

Requirement	Response
(a) a list of regulations that impose a material cost on performing vegetation management works (including, but is not limited to, bushfire mitigation regulations);	Electricity Safety Act 1998 Electricity Safety (Bushfire Mitigation) Regulations 2013 Electricity Safety (Electric Line Clearance) Regulations 2015 Electricity Safety Management Scheme Electricity Safety (Installations) Regulations 2009 AS4373 (Pruning of Amenity Trees) Environment Protection and Biodiversity Conservation Act 1999 Flora and Fauna Guarantee Act 1988

Requirement	Response
	Occupational Health and Safety Act Occupational Health & Safety (Plant) Regulations 1995 Green Book - Code of Practice on electrical safety for distribution businesses in the Victorian Electrical Supply Industry AS 1418.10 (Cranes, Hoists and Winches)
(b) a list of self-imposed standards from JEN's vegetation management program which apply to that zone; and	JEN Electric Line Clearance Management Plan JEN Bushfire Mitigation Plan JEN Customer Complaints Procedure VEM 20-50 Assessment Procedure (Jemena) VEM 10-05 Safety Observer/Offsider, Emergency Response & Single Person Work Procedure VEM 10-09 Guidelines for Conforming to Electrical Safety Requirements VEM 10-08 EWP Procedure VEM 10-06 Tree Climbing Procedure HSP 05-13 Working at Heights VEM 21-03 Management of Threatened Flora and Fauna VEM 20-02 Hazardous Tree and 56M Management Procedure
(c) an explanation of the cost impact of regulations and self-imposed standards on performing vegetation management work.	The cost of managing vegetation in accordance with regulations and self-imposed standards is increasing year to year due but not limited to the following factors; **Literal compliance** The 2015 Regulations saw a significant change from the requirement to have vegetation compliant in the HBRA during the period of 1 November each year to the end of the declared fire period (Typically 31 March the following year). This required a change to our program from annual vegetation management work in the HBRA and 3 yearly in the LBRA to potentially a biannual cut in the HBRA and an annual cut in the LBRA. This has resulted in an approximate increase of 300% in resources to both assess and cut vegetation around power lines to meet these requirements.

Requirement	Response
	Habitat Trees The 2015 Regulations also added the requirement for DNSPs to ensure that Fauna with a conservation status in Victoria of "vulnerable", "endangered" or "critically endangered" is identified. Once a tree that contains threatened fauna has been identified then cutting or removal of that tree must be undertaken outside of the breeding season for that species wherever practicable. JEN has engaged the services of a qualified environmental officer to undertake a review of the network and constantly monitor cutting programs to ensure that threatened fauna is protected. **Consultation** In the 2005 Regulations, a minimum notice period was specified (14 days) before cutting, with no expiration date of the period. In the 2015 Regulations this was changed and a 60 day window for trees to be actioned in. When that window is exceeded the customers must be re-notified. This has the effect of increased time spent notifying customers, increased time reapplying for suppression and it alters the annual program. Vegetation program management costs are also increasing due to increasing customer expectations. This has resulted in additional consultation with customers, community groups and councils. **Service Lines** There is an increased focus on the management and clearing of service lines (section 84(2)(a) of the Electricity Safety Act). JEN was required to increase the number of personnel assessing service lines due to the more stringent requirement to notify all customers with vegetation infringing the regulated space around a service line. In contrast, the previous regulations only required customers that had solid contact between their tree and the service line to be notified. JEN has also engaged a vegetation expert to manage this program and to follow up customers that have service lines with solid contact to ensure they clear trees for which they are responsible under the Electricity Safety Act. JEN's administration costs have also risen with the requirement to send out multiple letters to customers with offending vegetation if they fail to clear it within the predefined period. **Other Responsible Person (ORP) Follow Up** As with Service Lines, Energy Safe Victoria have increased their focus on JEN to have a program in place to ensure that ORPs such as councils (prior to 1 April 2014 also included Vic Roads, Metro Rail, Melbourne Water, etc.) maintain their trees in accordance with the Electricity Safety Act and subordinate Regulations.

Requirement	Response
	JEN has also engaged a vegetation company (Dual role including Other Responsible Person, private electric lines and service lines management) to manage this program and to follow up ORPs with non-compliances to ensure they clear their trees from overhead electric lines. JEN also absorbs costs for provision of network management (e.g. reclose suppression and processing of Permit to Work applications) to ORPs for cutting offending trees which were not cleared in a timely manner. This renders these trees unsafe to be cut by normal crews. In general terms, the closer the tree is to electric lines when it needs to be cut, the more expensive safety requirements make the work. Normal crews generally work well outside the clearance space and therefore are the least cost option. Although shut-downs are generally the most expensive, Live Line crews are more expensive than normal crews. Not all councils are alike and most cite inadequate budgets as the reason for non-compliance, which in turn makes the program more expensive for the council and for JEN. **Step Changes applicable to Electricity Safety (Electric Line Clearance) Regulations 2015 (2015 ELC regulations)** There were three (3) material changes in the 2015 ELC regulations for JEN. These are the a), compliance with the Amenity Tree Standard AS4373, b) additional notification and consultation requirements, and c) compliance with the requirement to provide assistance to councils. The changes in the obligations relating to amenity tree cutting practices will require JEN to incur additional costs to engage or train more qualified labour and changes in cutting equipment to comply with AS4373. Additional notification and consultation obligations introduce an increase in costs which are driven both by the increase in the number of notices JEN must send out and additional information JEN must put in each notice. Each notice requires additional work to comply with the 2015 ELC regulations such as including a diagram of specific tree details, including a dispute resolution procedure and researching whether a tree is of cultural, environmental, historical, ecological or aesthetic significance. It is now a mandatory requirement for JEN to provide assistance to local councils in relation to technical information about the overhead line (i.e. sag and sway dimensions) and information on safe cutting methods. All three new requirements are expected to increase in cost over the next few years as councils and JEN develop processes to comply with these step changes in the 2015 ELC regulations. **HSE** In order to comply with the Occupational Health and Safety Act JEN is constantly reviewing all components of their operations and investing time and resources into equipment, training, auditing and monitoring all crews to ensure that we have a safe workforce and community.

Requirement	Response
	Victorian Bushfires Royal Commission (VBRC) Recommendations These recommendations were enforced using "directions". Directions were made using mechanisms existing in the Electricity Safety Act 1998, specifically Section 141(2)(d) of the Electricity Safety Act 1998 requiring Jemena to amend our Electricity Safety Management Scheme. *RECOMMENDATION 30* *The State amend the regulatory framework for electricity safety to require that distribution businesses adopt, as part of their management plans, measures to reduce the risks posed by hazard trees—that is, trees that are outside the clearance zone but that could come into contact with an electric power line having regard to foreseeable local conditions.* The implementation of Recommendation 30 required JEN to develop a Hazard Tree assessment and cutting program for the Hazardous Bushfire Risk Area. This program is additional to JEN's existing electric line clearance programs, and adding significant cost. *RECOMMENDATION 31* *Municipal councils include in their municipal fire prevention plans for areas of high bushfire risk provision for the identification of hazard trees and for notifying the responsible entities with a view to having the situation redressed.* Energy Safe Victoria (**ESV**) requires JEN to "assist" municipal councils (per Recommendation 31) to meet their Hazard Tree management obligation and electric line clearance generally. This is adding significant cost to JEN's vegetation management program. *RECOMMENDATION 34* *The State amend the regulatory framework for electricity safety to strengthen Energy Safe Victoria's mandate in relation to the prevention and mitigation of electricity-caused bushfires and to require it to fulfil that mandate.* There were eight recommendations made directly targeting the major electricity companies in Victoria. Of these three were vegetation related, listed below as Recommendations 30, 31 and 34. ESV used the mandate of Recommendation 34 to strengthen Acts and Regulations in their jurisdiction, resulting in additional cost to JEN.

The response provided in the table above applies to both the LBRA zone and the HBRA zone.

Actual information

Variable	Source and why actual	Methodology	Assumptions
LBRA and HBRA, Tree trimming (excluding hazard trees) ($0's) LBRA and HBRA, Inspection ($0's) HBRA, Hazard tree cutting ($0's)	The source of the information is the SAP and VMS. The data is collected in the field and entered into data collection devices and is then loaded into the VMS. Reports are run directly from SAP and validated by VMS. (Please also refer to General Comments; Table 2.7.2 Expenditure Metrics by Zone below)	JEN outsources its vegetation maintenance to an expert service provider in this field. This information was recorded in SAP and validated by data provided by the vegetation management company using reports from the VMS.	No assumptions have been made in providing this information.
LBRA Hazard tree cutting ($0's)	JEN has not initiated any hazard tree cutting programs in this zone (LBRA). This data is captured by the vegetation management company.	This information was recorded in SAP and validated by data provided by the vegetation management company using reports from the VMS.	No assumptions have been made in providing this information.
LBRA and HBRA, Ground clearance ($0's)	JEN has not initiated any ground clearance programs. This data is captured by the vegetation management company.	This information was recorded in SAP and validated by data provided by the vegetation management company using reports from the VMS.	No assumptions have been made in providing this information.
LBRA and HBRA, Vegetation corridor clearance ($0's)	JEN has not initiated any vegetation corridor clearance programs. This data is captured by the vegetation management company.	This information was recorded in SAP and validated by data provided by the vegetation management company using reports from the VMS.	No assumptions have been made in providing this information.
LBRA and HBRA, Tree replacement program costs ($0's)	JEN has not initiated any tree replacement programs. Any trees replaced are on a case by case basis negotiated with the customer.	This information was recorded in SAP and validated by data provided by the vegetation management company using reports from the VMS.	No assumptions have been made in providing this information.
LBRA and HBRA, Audit ($0's)	The source of the information is the SAP and VMS. JEN's audit contract coordinator records the actual time spent auditing vegetation management services in SAP. The vegetation	This information was recorded in SAP and validated by data provided by the vegetation management company using reports from the VMS.	No assumptions have been made in providing this information.

Variable	Source and why actual	Methodology	Assumptions
	management company records the cost in VMS.		
LBRA and HBRA, Contractor Liaison expenditure ($0's)	The source of the information is the SAP and VMS. JEN's audit contract coordinator records the actual time spent auditing vegetation management services in SAP. The vegetation management company records the cost in VMS.	This information was recorded in SAP and validated by data provided by the vegetation management company using reports from the VMS.	No assumptions have been made in providing this information.
LBRA and HBRA, Other Vegetation Management Costs not specified in sheet ($0's)	This data is captured by the vegetation management company as "actual" information since 1 Jan 2016.	This information was recorded in SAP and validated by data provided by the vegetation management company using reports from the VMS.	No assumptions have been made in providing this information.

Estimated information

No estimated information is provided.

2.7.3 DESCRIPTOR METRICS ACROSS ALL ZONES - UNPLANNED VEGETATION EVENTS

Actual information

Variable	Source and why actual	Methodology	Assumptions
Number of fire starts caused by vegetation grow-ins (NSP responsibility) (0's)	This data was sourced from reports prepared for the AER in accordance with the F-factor scheme requirements.	In the RIN table prepared for the AER for the F-factor scheme all fire starts which did not result in burnt vegetation were filtered out. The "Fault description" field was read and sorted in to these two fire start variables.	All vegetation related fire start events are reported (e.g. by the public, fire control authority, or Jemena personnel) and when reported are recorded accurately in the JEN reporting systems.

Variable	Source and why actual	Methodology	Assumptions
	This data is considered actual because it is materially dependent on JEN's business records.		If the data is unclear who the Responsible Person is for electric line clearance then JEN is assumed to be the Responsible Person.
Number of fire starts caused by vegetation blow-ins and fall-ins (NSP responsibility) (0's)	This data was sourced from reports prepared for the AER in accordance with the F-factor scheme requirements. This data is considered actual because it is materially dependent on JEN's business records.	In the RIN table prepared for the AER for the F-factor scheme all fire starts which did not result in burnt vegetation were filtered out. The "Fault description" field was read and sorted in to these two fire start variables.	All vegetation related fire start events are reported (e.g. by the public, fire control authority, or Jemena personnel) and when reported are recorded accurately in the JEN reporting systems. If the data is unclear who the Responsible Person is for electric line clearance then JEN is assumed to be the Responsible Person.
Number of fire starts caused by vegetation grow-ins (Other Party Responsibility) (0's)	This data was sourced from reports prepared for the AER in accordance with the F-factor scheme requirements. This data is considered actual because it is materially dependent on JEN's business records.	In the RIN table prepared for the AER for the F-factor scheme all fire starts which did not result in burnt vegetation were filtered out. The "Fault description" field was read and sorted in to these two fire start variables.	All vegetation related fire start events are reported (e.g. by the public, fire control authority, or Jemena personnel) and when reported are recorded accurately in the JEN reporting systems. If the data is unclear who the Responsible Person is for electric line clearance then JEN is assumed to be the Responsible Person.
Number of fire starts caused by vegetation blow-ins and fall-ins (Other Party Responsibility) (0's)	This data was sourced from reports prepared for the AER in accordance with the F-factor scheme requirements. This data is considered actual because it is materially dependent on JEN's business records.	In the RIN table prepared for the AER for the F-factor scheme all fire starts which did not result in burnt vegetation were filtered out. The "Fault description" field was read and sorted in to these two fire start variables.	All vegetation related fire start events are reported (e.g. by the public, fire control authority, or Jemena personnel) and when reported are recorded accurately in the JEN reporting systems. If the data is unclear who the Responsible Person is for electric line clearance then JEN is assumed to be the Responsible Person.

Estimated information

No estimated information is provided.

2.8 MAINTENANCE

2.8.1 DESCRIPTOR METRICS FOR ROUTINE AND NON-ROUTINE MAINTENANCE

Actual information

Variable	Source and why actual	Methodology	Assumptions
ASSET QUANTITY - AT YEAR END	Information is sourced from SAP and GIS. This data was provided without estimation due to the completeness of JEN's age profile data.	For All Assets: Sum of all assets as per asset category at the respective year end 2017. Zone substation – other equipment is made up of the following asset types: • Zone Substation Circuit Breaker • Zone Substation Capacitor bank • Zone Substation Current Transformer • Zone Substation Voltage Transformer • Zone Substation RTU • Zone Substation NER • Zone Substation Battery Charger • Zone Substation Battery	No assumptions have been made.
ASSET QUANTITY -	Information is sourced from SAP. Reference was made to the appropriate SAP Plant Maintenance	The method included analysing all of the SAP Plant Maintenance (PM) Orders that were	No assumptions have been made.

Variable	Source and why actual	Methodology	Assumptions
INSPECTED/ MAINTAINED	(PM) Orders that were assigned to the maintenance activity.	assigned to the relevant maintenance activity codes. All PM orders were extracted as were the associated tasks from SAP. The tasks were classified as per the AER's Maintenance Asset Category where appropriate. The total in this category comprises the number of assets being maintained and also inspected in 2017.	
MAINTENANCE CYCLE	Information is sourced from SAP.	All planned maintenance and inspection tasks are documented and managed using the SAP Plant Maintenance (PM) module functionality. The functionality has enabled JEN to establish maintenance plans in SAP. A maintenance cycle or inspection cycle is associated with each maintenance plan. By directly querying SAP, the inspection/maintenance cycle is determined. Where there are multiple cycles applicable for the same maintenance asset category, the cycle is to reflect the highest cost activity.	No assumptions have been made.
AVERAGE AGE OF ASSET GROUP	Information is sourced from SAP and GIS.	Installation dates were taken from the method used for template 5.2. The average age is calculated by obtaining the average age of all in-service assets at year end. Note for the Distribution Substation Transformers category, JEN's prior year RIN responses reported asset age information based on distribution substation age, not transformer age. JEN's RIN response now reports for this variable based on transformer information.	No assumptions have been made.

Variable	Source and why actual	Methodology	Assumptions
		For the Distribution Substation - Other Equipment and Distribution Substation – Property categories, JEN's prior year RIN responses reported asset age information based on transformer age, not distribution substation age. JEN's RIN response now reports for this variable based on distribution substation information.	

Estimated information

No estimated information is provided.

2.8.2 COST METRICS FOR ROUTINE AND NON-ROUTINE MAINTENANCE

Actual information

Variable	Source and why actual	Methodology	Assumptions
Whole table	Information is sourced from the ERP system that JEN uses to capture its financial information hence it is considered to be actual data. As expenditure is incurred, it is captured in PM Orders (cost collectors). PM Order codes can be used to identify various maintenance activities. Some overheads applied to the direct costs have been removed for this template, as the requirement is to disclose direct costs only.	Maintenance costs disclosed in the RIN template are sourced from the SAP system. JEN's cost collection process uses a combination of projects (WBS elements) and cost centres to collect costs at the macro level. PM orders and activities are set up to collect costs at a micro level. These PM orders /activities are designed to collect costs based on the activity, on which an employee works and to accept any external costs associated with that activity e.g. Faults, Emergencies, and Standards and procedures.	JEN has a comprehensive model which underpins the maintenance costs disclosed in the RIN responses and previous Regulatory Accounting Statements. This model identifies the Direct Labour, Direct Materials, Contractor and Other Costs based on allocations from SAP.

Variable	Source and why actual	Methodology	Assumptions
		JEN uses time writing to capture internal labour costs. Where practical and appropriate all employees time write to a PM Order / activity or a client business e.g. JEN. These form the direct costs incurred for a respective activity. JEN allocates overheads to these activities based on its internal policies and in accordance with the AER approved Cost Allocation Method (CAM) Direct Labour, Materials, Contracts & Other are derived from General Ledger account groupings, with network overheads adjusted from respective account grouping. Reserve feeder costs are calculated based on related activities and are validated by experienced engineers. The proportion of total operating and maintenance costs that are attributable to the HV distribution system are determined by applying a percentage based on engineering calculations. The other component of the calculation is billed demand for reserve feeder customers which is the kilo watt volumes agreed between Jemena and its customers. Taking the percentage of 'billed demand for reserve feeder customer' from 'Actual Raw Peak System Demand' determines the percentage of the remaining cost pool from the above that is reserve feeder. A weighted average calculation of the total reserve feeder cost is then performed to determine the reserve feeder cost that is removed from the Maintenance activity/service codes.	

Variable	Source and why actual	Methodology	Assumptions
POLE TOP, OVERHEAD LINE & SERVICE LINE MAINTENANCE	As per general comment above.	The list of SAP activities include: • MOL Straightening Leaning Poles • MOM O/H Line Maintenance. – Pole Top Structures • MOS Overhead Service Adjustment • MOT Pole Top And O/H Repair Thermal Survey • NIH Supply Abolishment • NOD Service Inspection • NIY SCS Recoverable Opex works	As per general comment above.
POLE INSPECTION AND TREATMENT	As per general comment above.	The list of SAP activities include: • NOA Overhead Asset Inspection • NPA Pole Inspection • NPD Termite Treatment • NIY SCS Recoverable Opex works The activity code NOA: Overhead Asset Inspection has been assigned to the Pole Inspection and Treatment category as the nature of the work assigned is Pole inspection.	As per general comment above.
OVERHEAD ASSET INSPECTION	As per general comment above.	The list of SAP activities include: • MHT Distribution Substation Thermal Survey • NOC Line Switch Minor Adjustment • NOF Subtransmission/Feeder Thermal Surveys	As per general comment above.
NETWORK UNDERGROUND CABLE MAINTENANCE: BY VOLTAGE	As per general comment above.	The list of SAP activities include: • MUB Pits Maintained • MUD Underground Cable Testing • MUE Pillar Inspection	As per general comment above.

Variable	Source and why actual	Methodology	Assumptions
AND BY LOCATION LV - 11 TO 22 kV 33 kV AND ABOVE CBD OR NON-CBD		• MUG Pillar Maintenance • MUH Pillar Defects • MUI LV Cable And Joint Repairs • MUJ HV Cable And Joint Repairs • NIY SCS Recoverable Opex works Note the above activities readily identify the voltage of the maintenance activity enabling appropriate category allocation. The RIN categories for Location are CBD or Non-CBD. Since JEN has no feeders defined as CBD, all "Network Underground Cable Maintenance" is allocated to the Non-CBD location.	
DISTRIBUTION SUBSTATION EQUIPMENT, SWITCHGEAR & PROPERTY MAINTENANCE	As per general comment above.	The list of SAP activities include: • MEB Transformer/Kiosk Refurbishment • MHA Distribution HV Installation Maintenance • MHC ACR Inspection and Maintenance • MHD Distribution Substation Defects Maintenance • MHG Distribution Substation Grounds Maintenance • MHO Distribution Substation Oil Sample & Testing • MHP Distribution Substation Inspection • MHR Distribution Substation Maintenance • MSA Distribution Switchgear Maintenance • NVI Investigation Of Voltage Complaints • NXS Transformer Load Testing • NOB Line Switch Insp. and Functional Test	As per general comment above.

Variable	Source and why actual	Methodology	Assumptions
		• NOE Earth Testing	
ZONE SUBSTATION EQUIPMENT MAINTENANCE	As per general comment above.	The list of SAP activities include: • MZA Zone Substation Equipment Maintenance Primary • MZC Zone Substation Defect Maintenance Primary • MEA Refurbishment of Rotable Equipment	As per general comment above.
ZONE SUBSTATION PROPERTY MAINTENANCE	As per general comment above.	The list of SAP activities include: • MPA Zone Substation Property Maintenance • MPB Zone Substation Property Maintenance Defects • MZI Zone Substation Inspection & Audits	As per general comment above.
SCADA & NETWORK CONTROL MAINTENANCE	As per general comment above.	The list of SAP activities include: • ADC Planned Maintenance-SCADA • ADD Corrective Maintenance - SCADA • MZE Zone Subs. Maint. - Communications • MZF Zone Subs. Defect Maint.- Communications	As per general comment above.
PROTECTION SYSTEMS MAINTENANCE	As per general comment above.	The list of SAP activities include: • MZB Zone Substation Equipment Maintenance Secondary • MZD Zone Substation Defect Maintenance Secondary	As per general comment above.

Estimated information

No estimated information is provided.

2.9 EMERGENCY RESPONSE

2.9.1 EMERGENCY RESPONSE EXPENDITURE (OPEX)

Actual information

Variable	Source and why actual	Methodology	Assumptions
(A) TOTAL EMERGENCY RESPONSE EXPENDITURE ($0'S)	Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. As expenditure is incurred, it is captured in PM Orders (cost collectors). PM Order codes can be used to identify various maintenance activities. From the total Emergency cost from SAP, an estimated component for emergency cost associated with reserve feeders has been subtracted. It is impractical to collect emergency cost associated with reserve feeders separately because the total emergency cost is collected across all network assets and it is not feasible to allocate costs to the individual feeders (there are more than 200 individual feeders) on the network. Since this subtracted estimated component is only 0.64% of the total emergency response expenditure, the total emergency response expenditure is reported as actual given the degree of estimation involved, and that this information is not contingent upon assumptions for which there are valid alternatives and which could lead to a materially different presentation.	Emergency response costs disclosed in the RIN are sourced from the SAP system. JEN's cost collection process uses a combination of projects (WBS elements) and cost centres to collect costs at the macro level. PM orders and activities are set up to collect costs at a micro level. These PM orders/activities are designed to collect costs based on the activity on which an employee works and to accept any external costs associated with that activity e.g. Faults, Emergencies, and Standards and Procedures. JEN uses time writing to capture internal labour costs. Where practical and appropriate all employees time write to a PM order/ activity or a client e.g. JEN. These form the direct costs incurred for a respective activity. JEN allocates overheads to these activities based on its internal policies and in accordance with the AER approved Cost Allocation Methodology (**CAM**). Direct Labour, Materials, Contracts & Other are derived from General Ledger account groupings. Network Overheads and motor vehicle operating expenses have been excluded as these costs are reported under 2.10 Overheads and 2.6 Non-network respectively as the requirement is to disclose direct costs only.	The primary purpose of these activities is for maintenance and emergency works. It has also been assumed that all of the costs captured on the Major Event Days relate to that major event.

Variable	Source and why actual	Methodology	Assumptions
		Reserve feeder costs are calculated based on related activities and are validated by experienced engineers. The proportion of total operating and maintenance costs that are attributable to the HV distribution system are determined by applying a percentage based on engineering calculations. The other component of the calculation is billed demand for reserve feeder customers which is the kilo watt volumes agreed between Jemena and its customers. Taking the percentage of 'billed demand for reserve feeder customer' from 'Actual Raw Peak System Demand' determines the percentage of the remaining cost pool from the above that is reserve feeder. A weighted average calculation of the total reserve feeder cost is then performed to determine the reserve feeder cost that is removed from the Emergency Response activity/service codes.	
(B) MAJOR EVENTS O&M EXPENDITURE ($0's)	There were no major storms (Tropical cyclone of Category 1 or above as classified by the Australian Bureau of Meteorology) in 2017 and therefore these variables are not applicable to Jemena for the 2017 regulatory year.	N/A	N/A
(C) MAJOR EVENT DAYS O&M EXPENDITURE ($0's)	Information is sourced from SAP. As expenditure is incurred, it is captured in PM Orders (cost collectors). PM Order codes can be used to identify various maintenance activities. Network overheads and motor vehicle operating expenses have been removed for this template, as the requirement is to disclose direct costs only. JEN used the same system to report Emergency Response direct costs for the following event days	The methodology included analysing all of the SAP Plant Maintenance (**PM**) cost collectors that were assigned to the Emergency activity code for the major event days. This is a standard SAP report. The MED threshold has been calculated for the 2017 Regulatory Year in accordance with the requirements in the STPIS Appendix D using the 2.5 beta method.	Only the cost assigned on the actual major event day has been reported. The RIN template makes the assumption that the works are carried out on the actual day and don't overflow in the next day (after 12:00am), which is not always the case. However, JEN has reported cost only on the MED days in

Variable	Source and why actual	Methodology	Assumptions
	without the Reserve feeder allocation and is the basis for the actual information. There was no major event day in 2017.		accordance with the RIN template guideline.

Estimated information

No estimated information is provided.

2.10(A) OVERHEADS

In line with the instructions contained in the Excel template provided by the AER on 8 December 2017, JEN has chosen to complete template 2.10(A) and has therefore not completed template 2.10.

2.10.1 NETWORK OVERHEADS EXPENDITURE

Actual information

Variable	Source and why actual	Methodology	Assumptions
All variables in table	Network overhead expenditure is actual information that is extracted from the SAP ERP system and which forms part of the audited Annual RIN.	JEN's cost collection process uses SAP functionality to collect costs into WBS elements at the macro level. PM Orders are set up to collect costs at a micro level. These PM orders/activities are designed to collect costs based on the activity on which an employee works and to accept any external costs associated with that activity. WBS element codes are also designed to identify the regulatory category, e.g. standard control services, public lighting, metering, ancillary services, negotiated and unregulated services. JEN uses time writing to capture internal labour costs. Where practical and appropriate, all employees time write to a PM order or to a client e.g., JEN. These form the direct costs incurred for a respective activity. JEN allocates overheads to these activities based on its internal policies and in accordance with the AER-approved CAM. External supplier costs are captured by receipting costs against Jemena-issued purchase orders that identify the appropriate cost collector. *Network Overheads Opex (SCS & ACS):* The Network Overhead operating expenditure is derived by extracting all of JEN's financial transactions using a data extraction tool Business Intelligence (**BI**) and exported into Excel for analysis and sorting into the RIN table by regulatory category. *Capitalised Network Overheads (SCS & ACS):*	N/A

		JEN capitalises a portion of its overheads, sourced from the network type activities (generally Operational and Asset Management in nature). JEN's ERP system is designed to apply a level of overheads by various overhead functions to the direct costs of capex activities (PM order/activity). JEN calculates a percentage of overhead to be applied to the capex spend for the year. The calculation used is: *Direct Budget Overheads ÷ Total Budget Capex Program = Percentage of Applied Overhead* Examples of these are: – Direct Support Activities that are capital (e.g. [Capex Program – Management and Planning] in nature. It is not practical for Program Managers and Senior Management to record time against a multitude of specific cost collectors. They time write to a "bucket" cost collector, which is then distributed over the specific cost collectors usually based on the underlying direct costs of the respective cost collectors. *Other Distribution Services Negotiated and Unregulated Services:* Consistent with Capitalised Overheads SCS & ACS above. Negotiated and Unregulated regulatory classifications are based on WBS element codes.	

2.10.2 CORPORATE OVERHEADS EXPENDITURE

Variable	Source and why actual	Methodology	Assumptions
All variables in table	Corporate overhead expenditure is actual information extracted from the SAP ERP system, which reconcile with the Enterprise	JEN's cost collection process uses SAP functionality to collect costs into WBS elements at the macro level. PM Orders are set up to collect costs at a micro level. These PM orders/activities are designed to collect costs based on the activity on which an employee	N/A

	Support Function allocation which forms part of the audited annual RIN.	works and to accept any external costs associated with that activity WBS element codes are also designed to identify the regulatory category. JEN uses time writing to capture internal labour costs. Where practical and appropriate, all employees time write to a PM order or to a client e.g., JEN. These form the direct costs incurred for a respective activity. JEN allocates overheads to these activities based on its internal policies and in accordance with the AER-approved CAM. External supplier costs are captured by receipting costs against Jemena issued purchase orders that identify the appropriate cost collector. *Corporate Overheads Opex SCS & ACS:* Corporate overheads are recorded at a cost centre level or in a specific project at the source of origination, JAM. Corporate overheads charged to JEN from JAM are recorded in designated projects within JEN. Each corporate overhead accounting record in SAP for relevant JEN projects contains the details of the related JAM cost centre or specific project. *Capitalised Corporate Overheads SCS & ACS:* Refer to Capitalised Network Overheads SCS & ACS above. *Other Distribution Services Negotiated and Unregulated Services:* Consistent with Capitalised Corporate Overheads SCS & ACS above. Negotiated and Unregulated regulatory classifications are based on WBS element codes.	

2.11 LABOUR

Actual information

Variable	Source and why actual	Methodology	Assumptions
2.11.1 - Cost Metrics per Annum	The data is sourced from: • Payroll information from SAP (Spinifex) • Employee classifications from SAP master data & HR review • Employee time writing information from SAP • Assessment cycles from SAP. Jemena (**JEM**) uses its Enterprise Resource Planning (ERP) system, SAP to process its payroll transactions. These transactions capture employee information relating to hours worked, rate per hour, various types of leave,	JEN used a Spinifex extract with parameters to identify all Jemena employees for the current reporting period. This will capture all employees who have received payment during the current reporting year. This report shows the total actual payments and hours for the current reporting period that includes leave, ordinary time and overtime. To determine the employees associated with JEN, Cross Application Time Sheet (**CATS**) client analysis reports are executed using SAP BI. The report for all employees by quarter includes compliance, line item, utilisation and analysis information about time writing to each asset owner. Prior year the time writing by asset owner was captured using assigned "client" information. Current year time writing information was captured by individual project codes or by Work Breakdown Structure (**WBS**) element. Employees can have an assigned client as non-JEN but time written to JEN specific projects. Data for employee who direct time write to JEN as per JEN defined projects or WBS elements were extracted from this report. For employees who have partially time written during the quarter, the difference (between total working hours and time writing hours) was allocated to JEN by using assessment cycle allocation to JEN as per the employee's distribution cost centre. The RIN requires labour expenditure be categorised into AER defined categories. JEN further categorised its labour expenditure by providing the employee prior year data to the HR reporting analysts who review and amend the data to reflect the current reporting period's employee categories as required by the template.	The allocation to JEN is based on time writing/assessment cycles allocation. If the CATS client analysis report shows that an employee has not time written 100% to a project, the difference is allocated using the assessment cycle percentage applicable to the employee's distribution cost centre. Stand down hours are shown instead of occurrence (as per the definition contained in Appendix F of the RIN) as information is not available in the system. Employee allocation percentage is calculated on quarterly basis; assume employee has no cost centre change during the quarter.

Variable	Source and why actual	Methodology	Assumptions
	overtime, bonus and termination/redundancy payments, payroll tax, etc. JEM uses a payroll reporting tool, Spinifex, to extract payroll data required in the RIN template. Within JEM's SAP system, each employee is assigned a distribution cost centre. For direct employees engaged to work exclusively on JEN, payroll data is allocated directly to JEN. For employees who work across the Jemena portfolio of assets (i.e. finance, human resources, regulation, legal etc.), it attributes the time reported against the JEN asset and only that allocation of time is incurred in JEN's accounts.	In table 2.11.1 calculations are applied to determine: • TCR = base salary • ASL = Average Staffing Level. One ASL is one full-time equivalent employees undertaking Standard Control Services (**SCS**) work receiving salary or wages (Paid FTE) over the entire year. The ASL is the time charged against JEN during the year converted to full time equivalent then multiplied by the time writing percentage. • Total labour expenditure is labour expenses allocated to JEN • Average productive work hours per ASL: *(TCR hours + base hours-leave hours + overtime hours)/ASL*	
2.11.2 - Descriptor Metrics	This table requires JEN to provide various metrics for the current	The methodology is as described above.	As the information/allocation is not available in the system, the **Average productive work hours ordinary time hourly rate per ASL** excludes:

Variable	Source and why actual	Methodology	Assumptions
	reporting period labour costs. The source of the information is as described above.	JEN provides below the formula to calculate the metrics as required by this template. The following are for JEN costs and JEN ASL only. • Average productive work hours per ASL - ordinary time: *(TCR hour + base hour-leave hour)/ASL* • Average productive work hours hourly rate per ASL - ordinary time: *(TCR rate + base rate-leave rate)/(TCR hour + base hour-leave hour)/ASL* • Average productive work hours per ASL - overtime: *Overtime hours/ASL* • Average productive work hours hourly rate per ASL - overtime: *Overtime rate/Overtime hours/ASL*	• All direct costs associated with non-productive work hours related to ordinary time hours spent on standard control services (e.g. costs associated with annual leave accrued from working ordinary hours). • Other earnings, on costs and taxes. It includes: • Ordinary time salaries and wages in the year. The **Average productive work hours overtime hourly rate per ASL** excludes: • All direct costs associated with non-productive hours related to overtime hours spent on standard control services. • Other earnings, on costs and taxes. It includes: • Overtime salaries and wages in the year.

Estimated information

No estimated information is provided.

2.12 INPUT TABLES

Actual information

Variable	Source and why actual	Methodology	Assumptions
Template 2.12 – Input Tables **EXPENDITURE** (OPEX & CAPEX) Global description for Actual with details contained below	Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. As expenditure is incurred, it is captured by general ledger accounts and activity (cost collectors). Both general ledger and activity codes can be used to identify various cost activities. Overheads that are applied to the direct costs are excluded, as the requirement is to disclose direct costs only.	JEN's Capex and Opex cost collection process uses a combination of project codes, cost centres and profit centres to collect costs at the macro level. By extracting the costs from the general ledger accounts and the activity codes, costs can be categorised as: • Direct material expenditure • Direct labour expenditure • Contract expenditure • Other expenditure Related party transactions are captured within the contract expenditure category and were isolated for the purposes of reporting in the template. JEN was unable to obtain related party margin information from its related entity. Whilst the relevant entity for the purposes of this RIN is a related party, JEN (and JEN's parent entity) do not have sufficient influence to require the relevant entity to supply the requested information. JEN considers the contract with the relevant party to be on an arm's length basis as it was struck under an open tender process and any concerns around margins are alleviated through market testing.	n/a

Variable	Source and why actual	Methodology	Assumptions
		Embedded overheads have been removed from costs and reported as overheads.	
VEGETATION MANAGEMENT	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Opex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above. The cost in total agrees to 2.7 Vegetation Management under following zones: • Zone 1 (LBRA) • Zone 2 (HBRA).	n/a
ROUTINE MAINTENANCE	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Opex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above. The cost in total agrees to 2.8 Routine Maintenance under following maintenance categories: • Pole top, overhead line & service line maintenance • Pole inspection and treatment	n/a

Variable	Source and why actual	Methodology	Assumptions
		• Overhead asset inspection • Network underground cable maintenance • Distribution substation equipment & property maintenance • Zone substation equipment maintenance • Zone substation property maintenance • Public lighting maintenance • Scada & network control maintenance • Protection systems maintenance.	
NON-ROUTINE MAINTENANCE	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Opex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above. The cost in total agrees to 2.8 Non-Routine Maintenance under following maintenance categories: • Pole top, overhead line & service line maintenance • Pole inspection and treatment • Overhead asset inspection • Network underground cable maintenance • Distribution substation equipment & property maintenance	n/a

Variable	Source and why actual	Methodology	Assumptions
		• Zone substation equipment maintenance • Zone substation property maintenance • Public lighting maintenance • Scada & network control maintenance • Protection systems maintenance.	
OVERHEADS	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Opex and Capex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above. The cost in total agrees to 2.10(A) Overheads under following overhead categories: • Network overheads • Corporate overheads.	n/a
AUGMENTATION	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Capex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above.	n/a

Variable	Source and why actual	Methodology	Assumptions
		The cost in total agrees to 2.3 Augex under following asset categories: • Subtransmission substations, switching stations, zone substations • Subtransmission lines • HV feeders • Distribution substations • LV feeders • Other assets.	
CONNECTIONS	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Capex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above. The cost in total agrees to 2.5 Connections.	n/a
EMERGENCY RESPONSE	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Opex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above.	n/a

Variable	Source and why actual	Methodology	Assumptions
		The cost in total agrees to 2.9 Emergency Response under major event days.	
PUBLIC LIGHTING	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Capex and Opex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above. The cost in total agrees to 4.1 Public Lighting.	n/a
METERING	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Capex and Opex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above. The cost in total agrees to 4.2 Metering.	n/a
FEE-BASED SERVICES QUOTED BASED SERVICES	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Capex and Opex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for these categories.	n/a

Variable	Source and why actual	Methodology	Assumptions
		The methodology adopted for classifying the costs has been detailed above in the Global description section above. The costs in total agree to 4.3 Ancillary Services – Fee Based Services and 4.4 Ancillary Services – Quoted Services.	
REPLACEMENT	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Capex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above. The cost in total agrees to 2.2 Repex under following asset categories: • Poles • Pole top structures • Overhead conductors • Underground cables • Service lines • Transformers • Switchgear • Public lighting • SCADA network control and protection systems • Other.	n/a

Variable	Source and why actual	Methodology	Assumptions
NON-NETWORK EXPENDITURE	JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex). Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.	Capex and Opex costs are derived by extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category. The methodology adopted for classifying the costs has been detailed above in the Global description section above. The cost in total agrees to 2.6 Non-Network Expenditure under following expenditure categories: • IT and communications • Motor vehicles • Buildings and property • Other.	n/a

4.1 PUBLIC LIGHTING

4.1.1 DESCRIPTOR METRICS OVER YEAR

Actual information

Variable	Source and why actual	Methodology	Assumptions
Current population of lights	Jemena's Geographical Information (**GIS**) is the single source of actual data for the public lighting inventory. The data is extracted directly from the GIS. The GIS represents the current state of the network and is therefore considered "actual".	The GIS is the single source of the public lighting physical inventory, therefore we are able to count the number and type of luminaires. The actual data was obtained by running a report directly from GIS. The data was exported to a text file and imported into Microsoft Excel where a pivot table was used to determine the current light types and their quantities.	No assumptions have been made in providing this information.

4.1.2 DESCRIPTOR METRICS ANNUALLY

Actual information

Variable	Source and why actual	Methodology	Assumptions
Light Installation – Volume of Works and Expenditure – Major Road Light	Not applicable.	Not applicable.	In line with Table 6.3 of the AER's Detailed Issues and Responses – Public Lighting Services (distribution) Explanatory Statement on Final Category Analysis, it was deemed that the volumes associated with this variable is related to a negotiated public lighting service and is not required to be reported.

Variable	Source and why actual	Methodology	Assumptions
Installation & Minor Road Light Installation			
Light Installation – Volume of Works and Expenditure – Number of Poles Installed	Not applicable.	Not applicable.	In line with Table 6.3 of the AER's Detailed Issues and Responses – Public Lighting Services (distribution) Explanatory Statement on Final Category Analysis, it was deemed that the volumes associated with this variable is related to a negotiated public lighting service and is not required to be reported.
Light Installation – Volume of Works and Expenditure – Total Cost	Not applicable.	Not applicable.	In line with Table 6.3 of the AER's Detailed Issues and Responses – Public Lighting Services (distribution) Explanatory Statement on Final Category Analysis, it was deemed that the expenditure associated with this variable is related to a negotiated public lighting service and is not required to be reported.
Light Replacement Volume of Works and Expenditure – Major Road Light Replacement &	Jemena performs its own public lighting replacement work and records the activities in SAP via notifications containing the above mentioned Public Lighting Codes (MAT). Light replacement works are recorded using SAP Notifications against a particular light. The majority of the notifications are created by the 24x7 call centre which takes calls from the	By extracting the SAP notifications related to specific SAP Public Lighting Codes we can determine the quantity of light replacement activities and categorise them according to Major and Minor Roads. The SAP Public Lighting Codes (MAT) were; RLJ (Replace Single Light on Main Road) – All notifications with activity code RLJ relate to "Major Road Light Replacement".	No assumptions have been made.

Variable	Source and why actual	Methodology	Assumptions
Minor Road Light Replacement	public regarding lights that require replacement. This allows the attributes of the public light such as whether it is located on a Major Road or Minor Road to be analysed and reported.	RLM (Replace Single Light Minor Road) – All notifications with activity code RLM relate to “Minor Road Light Replacement”. RLN (Replace Single Light and Bracket Main Road) – All notifications with activity code RLN relate to “Major Road Light Replacement”. RLG (Replace With Sustainable Light) - All notifications with activity code RLG relate to “Minor Road Light Replacement”. RLO (Replace Single Light and Bracket Minor Road) – All notifications with activity code RLO relate to “Minor Road Light Replacement”. The public lighting notifications were extracted from SAP for 2017 and analysed.	
Light Replacement Volume of Works and Expenditure – Number of Poles Installed	Jemena’s GIS is the single source of actual data for public lighting pole replacement. The data is extracted directly from the GIS. The GIS represents the current state of the network and is therefore considered “actual”.	The GIS is the single source of the public lighting historic inventory, therefore we are able to count the number of removed public lighting poles. The actual data was obtained by running a report directly from GIS to look at all removed public lighting poles on the network. The list of removed poles was then filtered further using GIS to determine the number of poles that were removed and replaced with new poles.	It has been assumed that the words “NUMBER OF POLES INSTALLED” means “Replaced” rather than “INSTALLED”.
Light Replacement Volume of	This information is sourced from SAP. As expenditure is incurred, it is captured in such a fashion that activity (cost collectors) codes can	By extracting the SAP costs related to specific SAP Public Lighting Activities we can determine the total direct expenditure of light replacement activities.	No assumptions have been made.

Variable	Source and why actual	Methodology	Assumptions
Works and Expenditure Total Cost	be used to identify public lighting replacement expenditure. SAP collects costs based on the activity on which an employee works and the activity to which external costs are associated. These aggregate into WBS Elements (higher level cost collector) which in turn aggregates the costs at a project level. Opex expenditure categorisation is based upon activity/service category codes included in the WBS Elements coding. SAP Master data contains regulatory classification data which is cross-checked against a separate Investment Management System (**IMS**) Mapping table.	The public lighting costs were extracted from SAP for 2017 and analysed. Direct Expenditure consists of; • Direct Material expenditure • Direct Labour expenditure • Direct Contractors expenditure • Direct Other expenditure Costs do not include Direct Overheads and Corporate Overheads.	
Light Maintenance Volume of Works and Expenditure – Major Road Light Maintenance & Minor Road Light Maintenance	Jemena utilises a combination of contractors and internal crew to perform public lighting maintenance work and records the activities in SAP via notifications containing the above mentioned Public Lighting Codes (MAT codes). Light maintenance works are recorded using SAP Notifications against a particular light. The majority of the notifications are created by the 24x7 call centre which takes calls from the public regarding lights that require maintenance. The other significant contributor to the volume of light maintenance is as a result of lights that are identified as requiring maintenance through the	By extracting the SAP notifications related to specific SAP Public Lighting Codes we can determine the quantity of light maintenance activities and categorise them according to Major and Minor Roads. The SAP Public Lighting Codes (MAT) were; MLF (Main Road Public Lighting Fault) – All notifications with activity code MLF relate to “Major Road Light Maintenance”. MLP (Public Light Maintenance – Major Road Patrol) - This activity involves the patrol all main roads on a defined cycle to identify public lighting faults.	No assumptions have been made.

Variable	Source and why actual	Methodology	Assumptions
	routine patrols and through the bulk relamping program. The notification is created against the specific light that requires replacement. This allows the attributes of the public light such as whether it is located on a Major Road or Minor Road to be analysed and reported.	MRB (Bulk Lamp Replacement – Minor Roads) – All bulk lamp replacements are considered a maintenance activity performed on Minor Roads. MRF (Minor Road Public Lighting Fault) – All notifications with activity code MRF relate to "Minor Road Light Faults". The public lighting notifications were extracted from SAP for 2017 and analysed.	
Light Maintenance Volume of Works and Expenditure – Number of Poles Installed	Public lighting pole maintenance works are recorded using SAP Notifications. The majority of the notifications are created by the 24x7 call centre which takes calls from the public regarding lights that require maintenance. The notification is created against the specific light that requires maintenance. This allows the attributes of the public light such as whether it is located on a Major Road or Minor Road to be analysed and reported.	By extracting the SAP notifications related to specific SAP Public Lighting Codes we can determine the quantity of light maintenance activities and categorise them according to Major and Minor Roads. The SAP Public Lighting Codes (MAT) were; MLR (Public Light Pole Repairs Main Road) - All notifications with activity code MLR relate to "Maintenance of a Public Light Pole" and are considered maintenance activities performed on Major Roads. MRR (Public Lighting Pole Repairs Minor Road) - All notifications with activity code MRR relate to "Maintenance of a Public Light Pole" and are considered maintenance activities performed on Minor Roads. The public lighting notifications were extracted from SAP for 2017 and analysed.	It has been assumed that the words "NUMBER OF POLES INSTALLED" means "MAINTAINED" rather than "INSTALLED".

Variable	Source and why actual	Methodology	Assumptions
Light Maintenance Volume of Works and Expenditure Total Cost	This information is sourced from SAP, the ERP system that JEN uses to capture its financial information. As expenditure is incurred, it is captured in such a fashion that activity (cost collectors) codes can be used to identify public lighting maintenance expenditure.	By extracting the SAP costs related to specific SAP Public Lighting Activities we can determine the total direct expenditure of public light maintenance activities. The public lighting costs were extracted from SAP for 2017 and analysed. Direct Expenditure consists of; • Direct Material expenditure • Direct Labour expenditure • Direct Contractors expenditure • Direct Other expenditure Costs do not include Direct Overheads and Corporate Overheads.	No assumptions have been made.
Quality of Supply – Mean Days to Rectify or Replace Public Lighting Assets (days) and Volume of GSL Breaches	Light maintenance works are recorded using SAP Notifications. The majority of the notifications are created by the 24x7 call centre which takes calls from the public regarding lights that require maintenance. The notification is created against the specific light that requires maintenance. This allows the attributes of the public light such as whether it is located on a Major Road or Minor Road, whether it is a GSL eligible light and the number	The methodology is documented in Jemena Document No. **JEN PR 0500** - JEN AER Public Lighting Reporting Procedure. By extracting the SAP notifications related to specific SAP Public Lighting Codes we can determine the required quality of supply variables. Each SAP notification has the following information associated with it; • Location of the light	No assumptions have been made.

Variable	Source and why actual	Methodology	Assumptions
and GSL Payments	of days to rectify or replace the light to be analysed and reported.	• Attributes of the light • Whether or not a GSL is applicable • Defect start time and date • Defect end time and date • Duration of defect The public lighting notifications were extracted from SAP for 2017 and analysed.	
Quality of Supply – Volume of Customer Complaints	Customer complaints are managed by Customer Relations. Customer Relations may receive complaints through the following means: • Phone call to our Call Centre • Email • Phone call direct to Jemena • Internal referral of an email or phone call Customer Relations stores and maintains all customer complaints in the “Claims Database”.	Customer complaints can be classified into two categories: • A complaint that results from inaction of a previous action. For example, a customer may call about a light out and the light is still not repaired within the set time and the customer calls again to express dissatisfaction that light is still out. • A complaint is lodged on initial contact, whether by phone or email, expressing dissatisfaction. For example, a customer may call to express dissatisfaction with field crew who have damaged their front yard while performing public light maintenance. Both categories of complaints are considered legitimate complaints and are stored in the Claims Database with relevant detail.	No assumptions have been made. All data is an actual and can be traced back to a complaint on the Claims Database.

4.1.3 COST METRICS

Actual information

Variable	Source and why actual	Methodology	Assumptions
Light Installation	Not applicable.	Not applicable.	In line with Table 6.3 of the AER's Detailed Issues and Responses – Public Lighting Services (distribution) Explanatory Statement on Final Category Analysis, it was deemed that the expenditure associated with this variable is related to a negotiated public lighting service and is not required to be reported.

Estimated information

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
Light Replacement	Light Replacement works is recorded using SAP Notifications. The expenditure associated with performing this work is recorded against SAP projects. Each SAP project is associated with an SAP Activity Code.	By extracting the SAP notifications related to specific SAP Public Lighting Codes we can determine the quantity of light replacement activities. By extracting the SAP costs related to specific SAP Public Lighting Activities we can determine the total direct expenditure of light replacement activities. The SAP Public Lighting Codes (MAT) were; RLJ (Replace Single Light on Main Road)	Jemena is unable to calculate the unit rate for each light type and therefore we have been required to make the assumption that the material cost for each type of light has minimal impact on the overall unit rate. Therefore we have assumed that all light types in the same	This is the best estimate because it uses the best available information. JEN is unaware of a better estimation methodology.	JEN is currently undertaking a project (consistent with that which it proposed in its 2016-20 regulatory proposal) to identify and implement actions necessary to report actual information in the future. Whilst JEN already captures the expenditure in SAP

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
		RLN (Single Lantern and Bracket Replacement – Main Road) RLM (Replace Single Light Minor Road) RLO (Single Lantern and Bracket Replacement – Minor Road) RLG (Sustainable Light Replacement) Therefore the unit cost for a light replacement has been calculated using the cost to replace lights (total cost less the pole replacement cost) divided by the total number of lights that were replaced.	category are the same unit rate.		using the SAP activity mapping methodology, JEN will need to record the costs and volumes by light type which is not JEN's current business process. JEN will implement a change in business process and enhance its systems to capture record and report the required information.
Light Maintenance	Light Maintenance works is recorded using SAP Notifications. The expenditure associated with performing this work is recorded against SAP projects. Each SAP project is associated with an SAP Activity Code.	By extracting the SAP notifications related to specific SAP Public Lighting Codes we can determine the quantity of light maintenance activities. By extracting the SAP costs related to specific SAP Public Lighting Activities we can determine the total direct expenditure of light maintenance activities. The SAP Public Lighting Codes (MAT) were; MLF (Main Road Public Lighting Fault) MRB (Bulk Lamp Replacement – Minor Roads) MLP (Public Light Maintenance – Patrol – Main Road)	Jemena is unable to calculate the unit rate for each light type and therefore we have been required to make the assumption that the material cost for each type of light has minimal impact on the overall unit rate. Therefore we have assumed that all light types in the same category are the same unit rate.	This is the best estimate because it uses the best available information. JEN is unaware of a better estimation methodology.	JEN is currently undertaking a project (consistent with that which it proposed in its 2016-20 regulatory proposal) to identify and implement actions necessary to report actual information in the future. Whilst JEN already captures the expenditure in SAP using the SAP activity mapping methodology, JEN will need to record the costs and volumes by light type which is not JEN's current business process. JEN will implement a change in

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
		MRF (Minor Road Public Lighting Fault) Therefore the unit cost for a light maintenance has been calculated using the cost to maintain the lights (total cost less the pole maintenance cost) divided by the total number lights that were maintained.			business process and enhance its systems to capture record and report the required information.

4.2 METERING

NOTE – all information reported in template 4.2 and in the section below under the category “Meter Type 4” relates to AMI Meter Type 5 assets (interval meters (<160MWh) with remote communication functionality).

4.2.1 METERING DESCRIPTOR METRIC

Actual information

Variable	Source and why actual	Methodology	Assumptions
Meter volumes	The meter volume data is retrieved at the end of each year from JEN’s two SAP systems: • SAP ISU for Type 4 and Type 5 meters • SAP ERP for Type 6 meters	Meter classification • Type 4 = AMI (<160MWh) • Type 5 = Non AMI interval • Type 6 Accumulation - Peak & Off Peak	None.

4.2.2 COST METRICS (VOLUME AND COST)

Actual information

Variable	Source and why actual	Methodology	Assumptions
Meter Purchase Volume	Purchase volumes are accurately tracked in SAP ERP.	Purchase volumes are based on the number of new meters issued to contractors for installation (SAP ERP).	None.

Variable	Source and why actual	Methodology	Assumptions
		Meter issued for the purpose of installation is made up of: • Meter purchased by the business Not included are: • Meters purchased by AMI MRO program (as this meters are already in RAB) • Meters refurbished (as these meters are already in RAB) Type 5 & 6 meters are no longer issued.	
Meter Purchase Costs	Meter Purchase costs are accurately tracked in SAP ERP as per Jemena procurement policy. JEN's cost collection process uses a combination of projects (WBS elements) and cost centres to collect costs at the macro level. PM orders and activities are set up to collect costs at a micro level.	Expenditure information is obtained from the SAP ERP system. The expenditure reflects the costs of new BAU meters issued for installation in 2017. Meters purchased previously under AMI MRO program and any refurbished meters are not included as they have already been capitalised. Type 5 & 6 meters are no longer issued.	None.
Meter Testing Costs	Meter testing costs are accurately tracked within SAP ERP via specific projects and PMO.	Total costs for meter testing is tracked in SAP ERP (project Y99-16). Meter testing costs in this category includes $14.5k meter re-test cost (ACS fee based service) and is deemed to be immaterial. Note: decision was taken not to continue the testing of legacy meters, as these are progressively replaced.	None.

Variable	Source and why actual	Methodology	Assumptions
Meter Testing Volume	Accurately tracked in SAP ISU via Service Order.	Meter test volumes were identified from specific SAP ISU service order report. This category includes: • Mandatory sample testing of meters • Mandatory meter maintenance (e.g. CT meters compliance tests) • Meter accuracy tests (including customer requested re-tests that uncovered a genuine issue and therefore not paid by the customer)	None.
Meter Investigation Volume	All investigation volumes are accurately tracked within SAP ERP and Jemena reporting systems. Data presented is based on records stored in SAP ERP, SAP ISU and UIQ systems.	The volume is obtained from service order reports (SAP ERP for type 6 & SAP ISU for Type 4 & Type 5 meters) Service order type used for this activity is ZRMI Type 5 meter investigation was assumed to be zero. The volume of legacy meters is very small and reducing; with Type 5 meters representing less than 1% of legacy meters, hence considered immaterial.	Percentage of Type 5 meter investigation was not confirmed as it is deemed immaterially small (0-1) compared to the total number of investigation.
Meter Investigation Costs	The Meter Investigation costs are accurately tracked in SAP ERP via specific projects and PMO. JEN's cost collection process uses a combination of projects (WBS elements) and cost centres to collect costs at the macro level. PM orders and activities are set up to collect costs at a micro level.	Type 4 & 6 meter investigation costs are obtained from SAP ERP (Projects Y99-16, Y99-7) by reconciling contractor invoices with SAP ERP to segregate meter investigation cost. The costs also include internal labour to support JEN AMI field investigations (SAP ERP project Y99-7), which is obtained from time writing of specific FTEs.	None

Variable	Source and why actual	Methodology	Assumptions
		Type 6 meter investigation cost is calculated based on the volume of work done in SAP ERP multiplied by unit cost per investigation. (no Type 5 meter investigations were believed to be conducted this year, based on respective volumes of type 5 and 6 meters).	
Scheduled Meter Reading Volume	Scheduled meter read is accurately tracked in monthly reports managed by JEN Customer Operations team.	Scheduled meter reading is only required for type 5 and 6 meters. Contractor reports were used to confirm the volumes. Scheduled meter reading volume for type 5 meters is not captured separately due to very low population (44 sites) and it is deemed to be immaterial. Furthermore, the AER has previously provided JEN with a no-action letter in relation to the treatment of this small number of type 5 meters.	All Type 4 meters are read remotely and are not included here.
Scheduled Meter Reading Costs	The Scheduled Meter Reading costs accurately tracked within SAP ERP in specific projects and PMO and through invoices. JEN's cost collection process uses a combination of projects (WBS elements) and cost centres to collect costs at the macro level. PM orders and activities are set up to collect costs at a micro level.	Total costs for meter testing is accurately tracked in SAP ERP (project Y99-16). Scheduled meter reading cost for type 5 meters is not captured separately due to very low population (44 sites) and it is deemed to be immaterial.	All AMI meters are read remotely and therefore not reported under this meter reporting category.
Special Meter Reading Volume	N/A All special reads are performed as Fee -based Services and are covered in section 4.3.	N/A	Recovery of data from failed meters is covered in Sub-category Meter Maintenance.

Variable	Source and why actual	Methodology	Assumptions
Special Meter Reading Costs	N/A All Special Meter Reading costs are captured under Fee- based Services in section 4.3.	N/A	N/A
New Meter Installation Costs	New meter installation costs are captured under Fee-based Services and Quoted Services in section 4.3 and 4.4 respectively.	N/A	N/A
New Meter Installation Volume	Number of new meters installed, as a result of new connections requests is accurately tracked in SAP ISU.	The number of meters installed as a result of new connection requests obtained from SAP ISU (report ZRNC). It includes all new meters installed as a result of new connection activities, excluding meters installed for temporarily building supply. Only Type 4 meters are used for new installations.	None.
Meter Replacement Costs	The Meter Replacement costs are accurately tracked within SAP ERP via specific projects and PMO.	Meter Replacement costs are derived from SAP ERP (projects A10-5, A10-10). Costs include legacy to AMI replacement and meter faults replacements, and comprise of: • External contractor costs • Auxiliary materials costs *Note:* As a result of the AMI MRO program, most Type 5 & 6 meters have been replaced by Type 4 meters and as a consequence no costs associated with end of life family replacement of these meters were incurred yet.	None.

Variable	Source and why actual	Methodology	Assumptions
Meter Replacement Volume	Meter Replacements (Basic to AMI meter exchanges and faulty meter replacements) are accurately tracked through contractor reports and SAP ISU.	Faulty meter exchange is obtained from SAP ISU service order report (ZAEC & ZAMC). Legacy to AMI meter volume is accurately tracked in SAP ISU service order report.	None.
Meter Maintenance Volume	Meter Maintenance volume is accurately tracked in SAP ISU.	Type 4 Meter maintenance volumes obtained are from SAP ISU (IQ09 transaction to obtain list of meters received from Secure after refurbishment). Maintenance activities are activities that follow meter removal, which include: • meter refurbishment • meter control. *Note:* decision was taken not to continue maintenance of legacy interval meters, as these are progressively replaced.	All meters removed from service are assumed to be collected for the purpose of meter maintenance.
Meter Maintenance Costs	The Maintenance costs are accurately tracked within SAP ERP via specific projects and PMO.	Meter maintenance costs are obtained from SAP ERP. All cost incurred under Secure meter service contract is captured under specific project & PMO, which is 100% maintenance cost. Meter maintenance cost is obtained by reconciling the contractor's invoice with SAP ERP to segregate meter maintenance cost. Meter maintenance costs include: a) Meter refurbishment	None.

Variable	Source and why actual	Methodology	Assumptions
		i) Cost of external contractor b) Meter control i) Cost of external contractor *Note:* decision was taken not to continue maintenance of legacy interval meters, as these are progressively replaced, hence, no costs for type 5 and 6 meters.	
Remote Meter Reading Costs	The cost is captured as part of the IT Infrastructure OPEX, which is captured in SAP ERP.	The costs in this category is comprises of the efforts of JEN AMI NOC team that support meter read function. Remote meter reading process uses an automated collection system, supported by AMI Network Operation Centre (**NOC**) team. *Note:* the cost of AMI NOC team for 2017 is captured via timewriting as part of IT Infrastructure OPEX costs variable of this schedule.	This applies to Type 4 meters only.
Remote Meter Reading Volume	The meter read volume is calculated based on retailer billing cycle and the volume of Type 4 meters on Jemena network at the end of the year, which is accurately tracked by Jemena systems.	Type 4 meter readings are delivered to the market daily. The AMI meters are read every 4 hours. However, remote read volume in this category is based on retailer billing cycle (monthly). Hence for this category, remote read volume is calculated by multiplying the volume of JEN AMI meter volume by 12.	The meter read volumes are based on the reported volume of Type 4 meters on Jemena network at the end of the year, not on daily variation of the numbers of active meters in the market.
Remote Meter Reconfiguration Volume	The AMI Network Operations Centre team keeps accurate record of the number of re-configuration completed for each year.	Meter reconfiguration volume includes remote meter software & firmware updates. It excludes: • complete population upgrade to the next software version	None.

Variable	Source and why actual	Methodology	Assumptions
		• customer initiated remote meter reconfiguration (e.g. solar upgrades) Applies to Type 4 meters only.	
Remote Meter Reconfiguration Costs	The cost is captured as part of the IT Infrastructure OPEX variable of this schedule.	The reported cost relates to 2102 customer initiated solar meter re-configuration, which is a fee based service and was not moved to RIN 4.3 as the amount is immaterial. The costs in this category is comprised of the efforts of JEN AMI NOC team that support meter re-configuration function.	N/A.
IT Infrastructure OPEX Costs	IT Infrastructure OPEX Costs are accurately captured in SAP ERP and checked against management records. An agreed methodology is then used to apportion costs of shared resources that could not have been directly assigned to ACS metering work. The methodology used to define percentage split of shared resources across different regulatory categories is not contingent upon judgements and assumptions for which there are valid alternatives, which could have led to a materially different results.	IT Infrastructure OPEX Costs consist of the cost of IT labour and system maintenance renewals (e.g. licences, support contracts) to support running of metering systems' software, middleware and hardware. Includes Remote meter reading and Remote meter reconfiguration costs. The costs are tracked in SAP ERP and reconciled back with management records. All resources and support agreements that can be clearly assigned to ACS metering are captured. Then, all the resources that are used across multiple regulatory categories and assets are individually assessed, to establish the percentage of their work that can be applied to JEN ACS. The assessment follows consistent methodology, in line with recommendations from AER's Consultant report (*EMCa - Advice on allocation of advanced metering*	None.

Variable	Source and why actual	Methodology	Assumptions
		infrastructure (AMI) IT and communications expenditure - 14 April 2016)	
IT Infrastructure CAPEX Costs	IT Infrastructure CAPEX Costs are accurately tracked in SAP ERP. JEN's cost collection process uses a combination of projects (WBS elements) and cost centres to collect costs at the macro level. PM orders and activities are set up to collect costs at a micro level.	IT infrastructure Capex costs include any costs associated with procurement of new meter management, meter data management or back-office support systems for support of metering operations. Note: RIN C Metering Capex includes Negative Costs in CY17 RIN for Metering IT due to late re-adjustment of project costs from previous years.	None.
Communications Infrastructure CAPEX Costs	Communications Infrastructure CAPEX Costs are accurately tracked in SAP ERP. JEN's cost collection process uses a combination of projects (WBS elements) and cost centres to collect costs at the macro level. PM orders and activities are set up to collect costs at a micro level.	Communications Infrastructure CAPEX is derived from SAP ERP and is administered by JEN SCADA team. The cost include material costs and costs of installation of new Communication Relays, batteries and antennas required for communication of Type 4 meters (e.g. SAP ERP projects A10-009 for labour, VMM-009 for materials). Note: RIN C Metering Capex includes Negative Costs in CY17 RIN for Communications Infrastructure capex costs due to late re-adjustment of project costs from previous years.	None.
Communications Infrastructure OPEX Costs	Communications Infrastructure OPEX costs are accurately tracked in SAP ERP, but captured across other sub-categories of this schedule.	Captured across other sub-categories of this schedule (e.g. remote meter reads, meter investigations).	None.
Other Metering Costs	All materially significant costs in this category are accurately tracked within the SAP ERP system, via JEN's Y99 Projects and PMOs.	Other Metering costs are obtained directly from SAP ERP and include the following components: • Meter compliance (only Type 4 Meter – new connections)	None.

Variable	Source and why actual	Methodology	Assumptions
		• Meter Operations costs (captured under Type 4 Meter, as most of the work is only done on Type 4 meters) • Meter Data Management costs (for Type 4, 5, 6 and 7 meters) • Metering strategy & Planning (Type 4 meters) • Regulatory oversight (recorded against Type 4 meter)	

4.3 FEE-BASED SERVICES

4.3.1 COST METRICS FOR FEE-BASED SERVICES

Actual information

Variable	Source and why actual	Methodology	Assumptions
Volume data	Volume data for jobs completed in the month was sourced from JEN's two SAP systems (SAP ERP and SAP ISU) and so this information is reported as 'actual information'. These services are:- • De-energisation • Re-energisation • Special meter reading • Re-test of type 4, 5 and 6 metering installations for first tier customers with annual consumption greater than 160MWh • Fault response - not DNSP fault • Temporary disconnect/reconnect services • Wasted attendance - not DNSP fault • Service truck visits • Temporary supply services • Remote meter re-configuration • Remote De and re-energisation • Routine Connections -customers <100 amps • AMI Metering Exit Fees	Actual Billing information from JEN's internal business records has been used.	Billing lags by a month and so does cost data on completed jobs; therefore resultant unit cost is reflective of actual cost.

Variable	Source and why actual	Methodology	Assumptions
De-Energisation cost	Dollar data is captured in SAP ERP by projects and PMOs as actual.	This cost is made up of contractor and other direct costs and captured directly to specific projects (BAA-FCJ-5 and BAA-FCK-7) in SAP ERP.	None.
Re-energisation cost	Dollar data is captured in SAP ERP by projects and PMOs as actual.	This cost is made up of contractor and other direct costs and captured directly to specific projects (BAA-FCL-5 and BAA-FCM-8) in SAP ERP.	None.
Re-test of type 4, 5 and 6 metering installations for first tier customers with annual consumption greater than 160 MWh – Cost	Dollar data is captured in SAP ERP by projects and PMOs as actual. This cost $38.6k is captured in ACS metering project (Y99-7) in RIN 4.2.	Total costs for meter testing is accurately tracked in SAP ERP (project BAA-Y99-7). Meter testing costs in this category is calculated based on the total cost for meter testing minus the costs of customer paid re-tests, calculated as volume of paid re-test times the corresponding contractor unit rate (from Select Solutions). Note: decision was taken not to continue the testing of legacy meters, as these are progressively replaced. The costs ($38.6k) of customer paid re-tests are captured under Other metering – RIN 4.2.	
Wasted attendance - not DNSP fault – Cost	Dollar data is captured in SAP ERP by projects and PMOs as actual.	This cost is captured in SAP ERP under project BAA-NIW-7.	None.
Service truck visits – Cost	Dollar data is captured in SAP ERP by projects and PMOs as actual.	This cost is made up of business hour truck visits captured under project BAA-NID-9.	None.

Variable	Source and why actual	Methodology	Assumptions
Temporary supply services – Cost	Dollar data is captured in SAP ERP by projects and PMOs as actual.	Costs, excluding Network and Corporate overheads, are obtained from SAP ERP projects (BAA-CMZ-17 to 22, and BAA-CMU-9 and 13) and by applying percentage methodology. Percentage is calculated based on number of temporary supply jobs to the volume of overhead jobs completed in CY2017.	Overhead connections only.
Remote meter re-configuration – Cost	Dollar data is captured in SAP ERP by projects and PMOs as actual. This cost is captured in ACS metering project (Y99) in RIN 4.2.	Total costs for remote meter reconfiguration is accurately tracked in SAP ERP (project Y99-16). The costs ($14.5k) of remote meter reconfiguration is captured under Other metering – RIN 4.2.	
Routine Connections <100 amps – Cost	Dollar data is captured in SAP ERP by projects and PMOs as actual.	Costs, excluding Network and Corporate overheads, are obtained from SAP ERP projects (BAA-CMZ-17 to 22, and BAA-CMU-9 and 13) and by applying percentage methodology. Percentage is calculated based on number of temporary supply jobs to the volume of overhead jobs completed in CY2017.	
AMI Metering Exit Fees - Cost	There were no costs for Meter Exit fee for CY2017.	N/A	None.

Estimated information

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
Other Expenditure data	The services covered are: • Special meter reading • Fault response - not DNSP fault • Temporary disconnect/reconnect services • Remote de-energisation • Remote re-energisation There are no separable or identifiable projects which capture the cost of the above services, and therefore have been reported at $0.	JEN's system did not capture expenditure information in a way which was readily identifiable for these services. The cost to investigate or estimate the expenditure exceeds the benefit in doing so; given the expected spend for would be immaterial.	None.	The basis used enables audit trail and consistency with the reporting done under the Annual RIN. JEN is unaware of a better way for estimating these amounts.	JEN is currently undertaking a project (consistent with that which it proposed in its 2016-20 regulatory proposal) to identify and implement actions necessary to report actual information in the future. Whilst JEN already captures the expenditure in SAP ERP using the SAP activity mapping methodology, JEN will need to further educate relevant staff with the knowledge to understand the activities classified as Fee based and capture the information in the right activity code thereby removing the need to use judgement. JEN will continue to improve the process of capturing the costs in the relevant regulatory category.

4.4 QUOTED SERVICES

4.4.1 COST METRICS FOR QUOTED SERVICES

Actual information

Variable	Source and why actual	Methodology	Assumptions
Volume data	Volume data for jobs completed in the month was sourced directly from two of JEN's systems (SAP ERP and SAP ISU) and this information is reported as 'actual information'. These services are: • Supply abolishment > 100 amps • After hours truck by appointment • Routine Connections – customers >100 amps • Temporary covering of low voltage mains and service lines • Rearrangement of network assets at customer request • Elective Undergrounding • Exception - Reserve Feeder data was based on actual KW billed	Actual billing information from JEN's internal business records has been used.	Billing lags by a month and so does cost data on completed jobs; therefore resultant unit cost is reflective of actual cost.
Cost – Routine Connections - customers >100 amps	Dollar data is captured in SAP ERP by projects and PMOs as actual.	These costs, excluding network and corporate overheads, are captured in SAP ERP under CMV MAT code projects. Cost is made up of: • Field labour cost (Select Solutions contractor cost) • Back office cost (Aegis)	None.
Cost – Reserve feeder per KW	Underlying dollar data used to assess reserve feeder cost is captured in SAP ERP projects.	As per AER approved methodology.	None.

Variable	Source and why actual	Methodology	Assumptions
Cost – Elective Undergrounding	Dollar data is captured in SAP ERP by projects and PMOs as actual.	These costs, excluding network and corporate overheads, are captured in SAP ERP under CME MAT code projects. Cost is made up of: • Field labour cost (Zinfra contractor cost) • Back office cost (Aegis) Note: Actual cost is captured in CDA MAT code project and moved to CME MAT code project based on unit cost rate and volume.	None.
Cost – Temporary covering of low voltage mains and service lines	Dollar data is captured in SAP ERP by projects and PMOs as actual.	This cost is directly captured under NII, NIN and NIR MAT code projects.	None.
Cost – After hours truck by appointment	Dollar data is captured in SAP ERP by projects and PMOs as actual.	This cost is directly captured under NIG MAT code project.	None.
Re-arrangement of network assets at customer request	Expenditure associated with this service was captured in SAP ERP by projects and PMOs as actual, however was incorrectly captured as relating to unregulated services. This expenditure is immaterial and therefore is not reported here.	Analysis of project costs.	None.
Supply Abolishment > 100amps	Expenditure associated with this service was captured in SAP ERP by projects and PMOs as actual, however was incorrectly captured together with the costs of all other supply abolishments. Expenditure relating to supply abolishments > 100amps was deemed immaterial and therefore is not reported here.	Analysis of project costs.	None.

Estimated information

No estimated information is provided.

5.2 ASSET AGE PROFILE

5.2.1 ASSET AGE PROFILE

Actual information

Variable	Source and why actual	Methodology	Assumptions
Poles: Staking of a wooden pole	Dates for asset installation are extracted from SAP through BRIO query. BRIO is a system which extracts SAP data. BRIO has the capability to create queries for different cases based on different requirements.	Due to recent AER enquiries (AER letter reference D17/29505), JEN now reports the age profile of the pole's stake in this category, instead of the age profile of the pole itself. The pole support data is extracted from the GIS using a data interrogation tool.	No assumptions were made.
Poles – <=1kV, Wood, Concrete, Steel	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The LV poles data is extracted from the GIS (which includes assets owned by other parties) using a data interrogation tool. Once extracted the data is filtered to provide only in-service poles that belong to JEN. Dates for asset installations were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
Poles – >1kV & <=11kV, >11kV & <=22kV, Wood, Concrete, Steel	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The HV poles data is extracted from the GIS (which includes assets owned by other parties) using a data interrogation tool. Once extracted the data is filtered to provide only in-service poles that belong to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles	No assumptions were made.

Variable	Source and why actual	Methodology	Assumptions
		based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	
Poles: >22kV & <=66kV; Wood, Concrete, Steel	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The ST poles data is extracted from the GIS (which includes assets owned by other parties) using a data interrogation tool. Once extracted the data is filtered to provide only in-service poles that belong to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
Overhead Conductor - < = 1 kV	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The OH conductor data for LV is extracted from the GIS (which includes assets owned by other parties) using a data interrogation tool. Once extracted the data is filtered to provide only in-service conductors that belong to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
Overhead Conductor - > 1 kV & < = 11 kV, >11 kV & < = 22 kV	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The OH conductor data for HV is extracted from the GIS (which includes assets owned by other parties) using a data interrogation tool. Once extracted the data is filtered to provide only in-service conductors that belong to JEN.	No assumptions were made.

Variable	Source and why actual	Methodology	Assumptions
; Single-Phase, > 11 kV & < = 22 kV ; Multiple-Phase		Dates for asset installation were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	
Overhead Conductor - > 22 kV & < = 66 kV	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The OH conductor data for ST is extracted from the GIS (which includes assets owned by other parties) using a data interrogation tool. Once extracted the data is filtered to provide only in-service conductors that belong to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
Underground Cables – < = 1 kV	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The UG Cable data for LV is extracted from the GIS (which includes assets owned by other parties) using a data interrogation tool. Once extracted the data is filtered to provide only in-service cable that belong to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.

Variable	Source and why actual	Methodology	Assumptions
Underground Cables - >1kV & <=11kV, >11kV & <=22kV,	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The UG Cable data for HV is extracted from the GIS (which includes assets owned by other parties) using a data interrogation tool. Once extracted the data is filtered to provide only in-service cable that belong to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
Underground Cables -> 33 kV & < = 66 kV	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The UG Cable data for ST is extracted from the GIS (which includes assets owned by other parties) using a data interrogation tool. Once extracted the data is filtered to provide only in-service cable that belong to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
Service Lines – Residential and Commercial and Industrial (Simple Type)	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The OH and UG Service Line data is extracted from JEN's GIS (which includes assets recorded as owned by other parties) using a script written in GIS to extract only in service and JEN owned services. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived dates to produce age profiles based on the	Where the customer class is not recorded in GIS, those services with the usage of service were deemed to be a customer class of residential. Where the usage is recorded as "public lighting service" were deemed to be a customer class of commercial.

Variable	Source and why actual	Methodology	Assumptions
		methodology outlined in ELE PR 0011 Asset Age Profiling Methodology. The script in GIS is written to combine the information from the supply point to the information from the service line. The customer class attribute of the connected supply point was used to determine whether the service line was connected to a residential, commercial or industrial property.	
Service Lines < 11 kV (Complex Type) and Service Lines >11 kV	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The OH and UG Service Line data is extracted from the GIS (which includes assets recorded as owned by other parties) using a script written in GIS to extract only in service and JEN owned services. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology. The script in GIS is written to combine the information from the supply point to the information from the service line. The customer class attribute of the connected supply point was used to determine whether the service line was connected to a residential, commercial or industrial property.	Where the customer class is not recorded in GIS, those services with the usage of service were deemed to be a customer class of residential. Where the usage is recorded as "public lighting service" were deemed to be a customer class of commercial.
Transformers – Pole Mounted, Kiosk Mounted, Ground Outdoor / Indoor Chamber Mounted (excluding zone	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The distribution transformer data is extracted from the GIS (which includes assets owned by other parties) using a data interrogation tool. Once extracted the data is filtered to provide only in-service transformers that belong to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with	No assumptions were made.

Variable	Source and why actual	Methodology	Assumptions
substation transformers)		derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	
Transformers – Ground outdoor / Indoor chamber mounted : >33kV & <=66kV; <=15 MVA; and <=40 MVA (Zone Substation)	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The zone substation transformer data is extracted from SAP using a data interrogation tool, which includes assets owned by other parties. Once extracted the data is filtered to provide only in-service equipment that belongs to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
< = 11 kV ; Fuse	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The fuse equipment data is extracted from SAP using a data interrogation tool, which includes assets owned by other parties. Once extracted the data is filtered to provide only in-service equipment that belongs to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with derived and calculated dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.

Variable	Source and why actual	Methodology	Assumptions
< = 11 kV ; Switch, > 11 kV & < = 22 kV ; Switch < = 11 kV ; Circuit Breaker > 11 kV & < = 22 kV ; Circuit Breaker	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	All switches are extracted from SAP using a data interrogation tool, which includes assets owned by other parties. Once extracted the data is filtered to provide only in-service equipment that belongs to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with calculated and derived dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
> 33 kV & < = 66 kV ; Switch	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The <=66kV switch equipment is extracted from SAP using a data interrogation tool, which includes assets owned by other parties. Once extracted the data is filtered to provide only in-service equipment that belongs to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with calculated and derived dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
> 33 kV & < = 66 kV ; Circuit Breaker	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The circuit breaker equipment is extracted from SAP using a data interrogation tool, which includes assets owned by other parties. Once extracted the data is filtered to provide only in-service equipment that belongs to JEN.	No assumptions were made.

Variable	Source and why actual	Methodology	Assumptions
		Dates for asset installation were not known for all assets. Actual installed dates were combined with calculated and derived dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	
Public Lighting – Lamps	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The public lighting lamps data is extracted from the GIS using a data interrogation tool, which includes assets owned by other parties. Once extracted the data is filtered to provide only in-service public lighting lamps that belong to JEN. Twin T5 lanterns have two lamps, however in GIS they are represented as having a single lamp. Total volume of lamps was derived by counting twin T5s as having two lamps each. Dates for asset installation were not known for all assets. Actual installed dates were combined with calculated and derived dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
Public Lighting - Poles	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The public lighting pole equipment is extracted from SAP using a data interrogation tool, which includes assets owned by other parties. Once extracted the data is filtered to provide only in-service equipment that belongs to JEN.	No assumptions were made.

Variable	Source and why actual	Methodology	Assumptions
		Dates for asset installation were not known for all assets. Actual installed dates were combined with calculated and derived dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	
SCADA Network Control & protection systems - Field Devices (Relay)	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The zone substation equipment is extracted from SAP using a data interrogation tool, which includes assets owned by other parties. Once extracted the data is filtered to provide only in-service equipment that belongs to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with calculated and derived dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
SCADA Network Control & protection systems - Communication Network Assets	JEN's internal GIS system is the single source of the network asset data. JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.	The zone substation equipment is extracted from SAP using a data interrogation tool, which includes assets owned by other parties. Once extracted the data is filtered to provide only in-service equipment that belongs to JEN. Dates for asset installation were not known for all assets. Actual installed dates were combined with calculated and derived dates to produce age profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology.	No assumptions were made.
Assets with voltage levels of 33 kV and 132 kV	Not applicable. JEN does not have any assets operating at 33kV or 132kV, therefore all line items with these respective voltage levels have been set to zero.		

Variable	Source and why actual	Methodology	Assumptions
Mean and Standard Deviation	SAP is the source of data to calculate mean and standard deviation for all the asset categories. This data was able to be provided without estimation due to the completeness of the installed date and retirement date. This allowed the age of the asset to be determined and the mean and standard deviation to be calculated.	In order to obtain a mean replacement life and associated standard deviation the following data for each asset type was used: • Date of installation • Date of retirement • A sample size large enough to make the calculation of Standard Deviation meaningful.	No assumptions were made.

5.3 MD – NETWORK LEVEL

5.3.1 RAW AND WEATHER CORRECTED COINCIDENT MD AT NETWORK LEVEL (SUMMED AT TRANSMISSION CONNECTION POINT)

Actual information

Variable	Source and why actual	Methodology	Assumptions
Raw network coincident MD Date MD occurred Half hour time period MD occurred Winter/Summer peaking	Source: - \\vtalpwfile07\netmgt\network planning\terminal station forecasts\2017 AEMO Forecasts\Itron\JEN TOTAL MW and MVAr (2017).xls The data is the 15 minute MW transmission connection point wholesale meter readings that have been sourced from the Interval Meter Store (**IMS**). Therefore the data provided is actual data.	The raw adjusted total maximum demand (MW) and corresponding date and time for summer and winter is recorded in the data source file. The raw adjusted total maximum demand (MW) value and corresponding date, time and season are copied directly to the RIN template. The date/time provided is the end time of the 15 minute interval. Times provided are AEST, not AEDT (i.e. not adjusted for daylight savings time).	Category analysis RIN column headings are interpreted as follows to align with readily available data recorded in the normal course of business: Summer 2016/17 = 01/10/2016 to 31/03/2017 Winter 2017 = 01/04/2017 to 30/09/2017 As winter 2017 data is not yet available, 2017 raw coincident MD is assumed to occur in summer as JEN is a summer peaking network. Network coincident MD is assumed to occur at the time when the sum of terminal station connection point MW demand is greatest.
Embedded generation	Source: - \\vtalpwfile07\netmgt\network planning\terminal station forecasts\2017 AEMO Forecasts\Co-gen\JEN TOTAL GENERATION MW (2017).xls The data contained within the above files is 15 minute MW embedded generation meter	Only embedded generators above 1MW capacity are included, as follows: – Bioscience Research Centre – EDL – Bolinda Landfill – EDL – Brooklyn Landfill – Preston Mini Hydro – Visy	LaTrobe University cogen is not included at subtransmission level as it is connected via the AusNet Services network. Somerton Power Station not included since it is connected at terminal station level and is not included in the raw network coincident MD.

Variable	Source and why actual	Methodology	Assumptions
	readings sourced from the Interval Meter Store (IMS). Therefore the data provided is actual data.	The total MW value corresponding to the date and time of maximum MW demand (as above) is copied directly to the category analysis RIN template.	
Weather corrected (10% PoE) network coincident MD Weather corrected (50% PoE) network coincident MD	Source: - \\vtalpwfile07\netmgt\network planning\AER\3 - Category Analysis (RIN C)\2018 RIN C (2017 data)\Template 5.3 & 5.4\2017 Maximum Demand Forecast analysis.xls This data is a calculated actual, based on the actual metered maximum demand and temperature, using Jemena's established method for temperature adjustment.	The 10% POE and 50% POE average daily temperatures and MD temperature sensitivity relationship is based upon observed historical data. Adjusted MW MD is calculated as follows: $$MD_b = MD_a \times \frac{-1.524{t_b}^2 + 108.5t_b - 925.2}{-1.524{t_a}^2 + 108.5t_a - 925.2}$$ Where: MD_b = MW MD after temperature adjustment MD_a = actual unadjusted MW MD t_b = average daily temperature to adjust to (32.9°C for 10% POE or 29.4°C for 50% POE) t_a = average daily temperature on day of actual unadjusted MW MD Average daily temperature is calculated as follows: $$t = \frac{(t_{max} - t_{min})}{2}$$ Where: t = average daily temperature t_{max} = maximum temperature of the day (24 hour period) (data sourced from PI) t_{min} = minimum temperature of the day (24 hour period) (data sourced from PI)	It is assumed that the 10% POE and 50% POE average daily temperatures and MD temperature sensitivity relationship is consistent over the period 2009-2016.

Estimated information

No estimated information is provided.

5.4 MD & UTILISATION – SPATIAL

5.4.1 NON-COINCIDENT & COINCIDENT MAXIMUM DEMAND

Actual information

Variable	Source and why actual	Methodology	Assumptions
Subtransmission Substation – Substation Rating	Data not provided (cells left blank). JEN does not own any subtransmission substations or terminal stations.	Not applicable.	Not applicable.
Subtransmission Substation – Raw Adjusted MD Subtransmission Substation – Date MD Occurred Subtransmission Substation – Time MD Occurred	Source: Summer - Non-coincident data: Jemena Demand Forecast Model – Forecast Input and Constants Spreadsheet - Coincident data: Jemena Demand Forecast Model – Historical System Coincident Demand Spreadsheet Winter - Non-coincident data: Jemena Interval Meter System (IMS)	Non-coincident data: The maximum total MW demand and corresponding MVAr, date and time for summer and winter is recorded in the JEN Load Demand Forecast (1forecast inputs & constants.xlsm). Since winter MDs have not yet been extracted in the normal course of business, winter MDs are extracted separately for stations where the MD has occurred during winter within the last 5 years. For the season where MW MD is greatest, the MW MD value, MVA (calculated from MW MD and corresponding MVAr value), date, time and season are copied directly to the category analysis RIN template. Coincident data: Date, time and season of MD are as per RIN C template 5.3. The MW demand values and MVA (calculated from MW and MVAr) corresponding to these times are copied directly from the JEN load demand forecast (9Historical System Coincident Demand.xlsm) into the category analysis RIN template.	JEN does not keep record of transmission connection point MD data in the normal course of business, therefore total data for JEN load on each terminal station bus group is provided as this data is readily available. MVA MD is assumed to occur at the time of MW MD. Category analysis RIN column headings are interpreted as follows to align with readily available data recorded in the normal course of business: Summer 2016/17 = 01/10/2016 to 31/03/2017 Winter 2017 = 01/04/2017 to 30/09/2017 It is assumed that if a station did not have a winter MD in the past 5 years then it will not have a winter MD in

Variable	Source and why actual	Methodology	Assumptions
Subtransmission Substation – Winter/Summer Peaking	The data contained within the above files is 15 minute MW and MVAr transmission connection point wholesale meter readings sourced from the Interval Meter Store (**IMS**) and Itron. Therefore the data provided is actual data.	The date/time provided is the end time of the 15 minute interval (AEST). Note: MD data contained within the data source file has been adjusted to system normal conditions by accounting for temporary switching and for temporary load changes from major customers. The methodology for identifying abnormals is to visually inspect the graphed demand data. The methodology to adjust for abnormals is as follows: • Non-coincident data: Demand during abnormal conditions is ignored and the highest demand under system normal conditions is recorded as the MD. For long-term abnormals, MD is estimated. Please refer to 'Estimated Information' section below. • Coincident data: If the station is under abnormal conditions at the time of coincident MD, the MD is estimated. Please refer to 'Estimated Information' section below.	2017. All new stations and stations with significant permanent transfers were checked for winter MDs. "Coincident" is assumed to be at the time of JEN network coincident MD, as per template 5.3.
Subtransmission Substation – Adjustments – Embedded Generation	Source: - Jemena Demand Forecast – Total Generation 2017 Spreadsheet The data contained within the above files is 15 minute MW embedded generation meter readings sourced from the Interval Meter Store and Itron. Therefore the data provided is actual data.	Only embedded generators above 1MW capacity are included, as follows: – Bioscience Research Centre – EDL – Bolinda Landfill – EDL – Brooklyn Landfill – Preston Mini Hydro – Somerton Power Station* – Visy The MW value corresponding to the date and time of maximum MW demand (as above) is copied directly to the category analysis RIN template for each terminal station / bus group.	LaTrobe University cogen is not included at subtransmission level as it is connected via the AusNet Services network.

Variable	Source and why actual	Methodology	Assumptions
		*SMTS MD does not include Somerton Power Station.	
Zone Substation – Substation Rating	Source: - Distribution Annual Planning Report 2017 The ratings are actual data as they are the normal cyclic ratings as per the transformer nameplates, except where transformers have been de-rated based on asset condition or where other network components limit the rating of the transformers (e.g. transformer cables).	Zone substation normal cyclic ratings (MVA) are copied directly from the Distribution Annual Planning Report (**DAPR**). The rating provided in the RIN template is the rating at the time of MD. The normal cyclic ratings given in the DAPR are as per the transformer nameplate except where transformers have been de-rated based on asset condition or where other network components limit the rating of the transformers (e.g. transformer cables, where normal cyclic ratings are determined from manufacturer data sheets and modelling of the installation). Zone substation ratings are provided only where the substation is owned by JEN. Ratings are not provided (cells left blank) for the following zone substations owned by customers or other distribution network service providers: – KLO – MAT – MB – SA – TT – VCO – WT	For each year the rating provided is for the season in which the MD occurs.
Zone Substation – Zone Substation – Raw Adjusted MD	Source: <u>Summer</u> - Non-coincident data:	<u>Non-coincident data:</u> The maximum total MW demand and corresponding MVAr, date and time for summer and winter is recorded in the JEN Load Demand Forecast (1forecast inputs & constants.xlsm). Since winter MDs have not yet been extracted in the normal course of business, winter MDs are extracted separately for stations where the MD has occurred during winter	MVA MD is assumed to occur at the time of MW MD. As JEN load at SA is supplied from shared feeders, there is no metered actual data available for JEN load.

Variable	Source and why actual	Methodology	Assumptions
Zone Substation – Date MD Occurred Zone Substation – Time MD Occurred Zone Substation – Winter/Summer Peaking	Jemena Demand Forecast Model – Forecast Input and Constants Spreadsheet - Coincident data: Jemena Demand Forecast Model – Historical System Coincident Demand Spreadsheet <u>Winter</u> - Non-coincident data: Jemena SCADA system The data contained within the above source files is extracted from PI and IMS/ Itron. This is actual metered MD data.	within the last 5 years. For the season where MW MD is greatest, the MW MD value, MVA (calculated from MW MD and corresponding MVAr value), date, time and season are copied directly to the category analysis RIN template. <u>Coincident data:</u> Date, time and season of MD are as per RIN C template 5.3. The MW demand values and MVA (calculated from MW and MVAr) corresponding to these times are copied directly from the JEN load demand forecast (9Historical System Coincident Demand.xlsm) into the category analysis RIN template. For zone substations KLO, MAT, MB, TT, VCO and WT, data has been extracted from the interval meter store (IMS) and Itron, and the date/time provided is the end time of the 15 minute interval (AEST). For all other zone substations, data has been extracted from OSI PI and date time provided is exact time of MD (adjusted for daylight savings time, i.e. AEDT). Zone substation demand is at the transformer and therefore includes the impact of any capacitor banks at the terminal station. Note: MD data contained within the data source file has been adjusted to system normal conditions by accounting for temporary switching and for temporary load changes from major customers. The methodology for identifying abnormals is to visually inspect the graphed demand data. The methodology to adjust for abnormals is as follows: • Non-coincident data: Demand during abnormal conditions is ignored and the highest demand under system normal conditions is recorded as the MD. For long-term abnormals, MD is estimated. Please refer to ‘Estimated Information’ section below.	Therefore, SA MD is estimated. Please refer to ‘Estimated Information’ section below. Category analysis RIN column headings are interpreted as follows to align with readily available data recorded in the normal course of business: Summer 2016/17 = 01/10/2016 to 31/03/2017 Winter 2017 = 01/04/2017 to 30/09/2017 It is assumed that if a station did not have a winter MD in the past 5 years then it will not have a winter MD in 2017. All new stations and stations with significant permanent transfers were checked for winter MDs. “Coincident” is assumed to be at the time of JEN network coincident MD, as per template 5.3.

Variable	Source and why actual	Methodology	Assumptions
		Coincident data: If the station is under abnormal conditions at the time of coincident MD, the MD is estimated. Please refer to 'Estimated Information' section below.	
Zone Substation – Adjustments – Embedded Generation	Sources: - Jemena Demand Forecast – Total Generation 2017 Spreadsheet The data contained within the above files is 15 minute MW embedded generation meter readings sourced from the Interval Meter Store and Itron. Therefore the data provided is actual data.	Only embedded generators above 1MW capacity are included, as follows: – Bioscience Research Centre (ZSS: NH) – EDL – Bolinda Landfill (ZSS: BD) – EDL – Brooklyn Landfill (ZSS: TH) – LaTrobe University (ZSS: TT) – Preston Mini Hydro (ZSS: CN) – Visy (ZSS: VCO) The cogen MW value corresponding to the date and time of maximum MW demand (as above) is copied directly to the category analysis RIN template.	Somerton Power Station is not included at zone substation level as it is connected at subtransmission level.
Subtransmission Substation – Weather Corrected MD Zone Substation – Weather Corrected MD	This data is a calculated actual, based on the actual metered maximum demand and temperature, using Jemena's established method for temperature adjustment. Source: - Jemena SCADA system	The 10% POE and 50% POE average daily temperatures and MD temperature sensitivity relationship is based upon observed historical data. Adjusted MW MD is calculated as follows: $MD_b = MD_a \times \frac{-1.524{t_b}^2 + 108.5t_b - 925.2}{-1.524{t_a}^2 + 108.5t_a - 925.2}$ Where: MD_b = MW MD after temperature adjustment MD_a = actual unadjusted MW MD	It is assumed that the 10% POE and 50% POE average daily temperatures and MD temperature sensitivity relationship is consistent over the period 2009-2016. Weather corrected MD is assumed to have the same MW/MVA ratio as raw adjusted MD.

Variable	Source and why actual	Methodology	Assumptions
	Source of coefficients A, B and C used for calculations in above file: - Jemena Demand Forecast Model – Forecast Input and Constants Spreadsheet	t_b = average daily temperature to adjust to (32.9°C for 10% POE or 29.4°C for 50% POE) t_a = average daily temperature on day of actual unadjusted MW MD Average daily temperature is calculated as follows: $t = \frac{(t_{max} - t_{min})}{2}$ Where: t = average daily temperature t_{max} = maximum temperature of the day (24 hour period) (data sourced from PI) t_{min} = minimum temperature of the day (24 hour period) (data sourced from PI)	

Estimated information

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
SA zone substation: Zone Substation – Raw Adjusted MD – Coincident & Non-coincident Zone Substation – Date MD	JEN load at zone substation SA consists of sections of feeders. Metering of the JEN load supplied by SA is unavailable, therefore the MD must be estimated.	Metered data for the full load on SA feeders is not available. The MD at SA is estimated by aggregating the AMI and interval metered data from the individual customers supplied from SA feeders. The data is considered to be an estimate as AMI and interval meters record half an hour energy data, which will not be the true reflection of the actual MD. Additionally, customers without an active AMI or interval meter will not be included in the recorded MD.	It is assumed that the majority of customers supplied from the feeders have an active AMI meter. It is assumed that the 30min average energy consumption is a close representation of the instantaneous MD.	AMI meter data is the closest actual data that JEN currently has available to estimate loading on the SA zone substation. JEN is unaware of a better estimation methodology.	JEN is currently undertaking a project (consistent with that which it proposed in its 2016-20 regulatory proposal) to identify and implement actions necessary to report actual information in the future.

Variable	Why estimate, not actual	Basis for estimate	Assumptions	Why best estimate	Actions to report actual data in future
Occurred – Non-coincident Zone Substation – Time MD Occurred – Non-coincident Zone Substation – Winter/Summer Peaking – Non-coincident Zone Substation – Weather Corrected MD		Jemena's established method for temperature adjustment (as set out the Subtransmission/Zone Substation – Weather Corrected MD section above) was applied to the MD at SA to calculate the weather corrected MD.			

6.3 SUSTAINED INTERRUPTIONS

6.3.1 SUSTAINED INTERRUPTIONS TO SUPPLY

Actual information

Variable	Source and why actual	Methodology	Assumptions
Sustained interruptions to supply (2017)	Jemena's Outage Management System (**OMS**) is the repository for all outage information since 18 June 2010. The system contains outage dates and times, the number of customers affected, restoration dates, times, restoration stages and cause descriptions. As the sustained interruptions information can be directly sourced from the OMS, we consider it to be 'actual information'.	The data used to calculate the reliability variables (KPIs) is extracted from OMS at the end of each month and is validated and cleansed to correct data errors. The cleansed data is loaded into the Customer Minutes Off Supply (**CMOS**) database. The reliability KPIs are then calculated. The cause descriptions in OMS are JEN cause descriptions. Each event cause has been verified against the event description and corrected in the CMOS database. They are then mapped to the "Reason for interruption" and the "Detail reason for interruption" where applicable. For vegetation related outages, the "Detailed reason for interruption" for each event has been verified against JEN's Electric Line Clearance Performance Report 2017 produced for the ESV and Councils. Effect on unplanned SAIDI (Column J) and Effect on unplanned SAIFI (Column K) are calculated by dividing unplanned customer minutes-off-supply and unplanned customer affected respectively with urban or rural-short customer numbers as per feeder classifications reported in the Annual RIN. An unplanned outage is defined as outages where the	For single premise outages where the service fuse has blown and no clear identification of which element caused the fuse to operate and was not specified as cause not found, JEN has allocated the Reason for interruption to Asset failure and Detailed reason for interruption to LV.

Variable	Source and why actual	Methodology	Assumptions
		duration is longer than 1 minute and customers were not given 4 business days' notice. Where the Reason for interruption is "Planned", the Effect on unplanned SAIDI and Effect on Unplanned SAIFI is zero. JEN has included momentary interruptions (interruptions of less than or equal to 1 minute) in template 6.3 'sustained interruptions to supply' based on the definition of 'sustained interruption' in the category analysis RIN (18.2) which is an interruption greater than 0.5 seconds. JEN's circuit breakers protection auto-reclose dead time function is set to 5 seconds in general and so even if an event is defined as momentary, it will be considered a sustained interruption in the category analysis RIN based on the definition. Where the outage is momentary indicated by average duration being zero in Column I, the Effect on unplanned SAIDI and Effect on Unplanned SAIFI is zero. Urban or rural-short customer numbers are calculated as average of at the start and at the end of the reporting period and are equal to the numbers reported in the Annual RIN Table 6.2.4.	

BALANCING ITEM RECONCILIATION

JEN RIN C - SCHEDULE OF "BALANCING ITEMS" - EXPENDITURE SUMMARY TEMPLATE 2.1	Amount $
TABLE 2.1.1 - STANDARD CONTROL SERVICES CAPEX	
Public Lighting - Duplication of Direct costs as it appears in both the Repex and the Public lighting templates	(1,122,707)
Connections - Duplication of direct costs as it appears in both the Connections and Fee & Quoted templates	(6,036,471)
Non-network - Duplication of Capitalised Network & Corporate Overheads as they appears in both Non-network & Overhead templates	(54,110)
Alternate control services share of Non Network (Motor Vehicle & General equipment) included in RIN C Non-Network category	(49,716)
ACS Metering - Non-network recorded in RIN A ACS Metering and RIN C Non-Network	238,173
TOTAL	(7,024,831)
TABLE 2.1.2 - STANDARD CONTROL SERVICES OPEX	
Non-Network IT cost duplication that appears in Non Network Opex and Corporate Overheads (SCS)	(11,793,001)
The impact of the difference in definitions of corporate overheads in RIN A vs RIN C e.g. some of Motor vehicle costs is reported as SCS, ACS and Metering in RINA, whereas in RIN C reported as motor vehicles	(123,570)
The impact of the difference in definitions of Network overheads in RIN A vs RIN C	(891,000)
Network Overheads Opex included in Non Network Opex and Network Overheads Opex	(439,518)
Maintenance number duplicated when categorising 'by location'	(122,608)
Other	73,919
TOTAL	(13,295,777)

JEN RIN C - SCHEDULE OF "BALANCING ITEMS" - EXPENDITURE SUMMARY TEMPLATE 2.1	Amount $
TABLE 2.1.3 - ALTERNATIVE CONTROL SERVICES CAPEX	
Duplication of ACS Connections Direct costs as it also appears in Fee Based & Quoted templates	(6,036,471)
ACS Amounts not reported in RIN A (including overheads) - Connections & Ancillary Network Services (Note: RIN A 8.2.3 only included Metering & Public Lighting)	(7,786,437)
TOTAL	(13,822,908)
TABLE 2.1.4 - ALTERNATIVE CONTROL SERVICES OPEX	
The impact of the difference in definitions of corporate overheads in RIN A vs RIN C e.g. some of Motor vehicle costs is reported as SCS, ACS and Metering in RINA, whereas in RIN C reported as motor vehicles	123,570
The impact of the difference in definitions of corporate overheads in RIN A vs RIN C e.g. some of IT costs is reported as SCS, ACS and Metering in RINA, whereas in RIN C reported as gross IT	891,000
Other	(73,919)
TOTAL	940,651