# Jemena Electricity Networks (Vic) Ltd

## Response to the Category Analysis Regulatory Information Notice for regulatory year 2016

Basis of Preparation

Public

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# 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 |

# 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 2016. RIN data templates and accompanying audit report and review report are due to the Australian Energy Regulator (**AER**) by 1 May 2017. 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 3 November 2016, 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 2016 regulatory year.

15. On 14 November 2016, the AER advised JEN that it accepted JEN's need to provide some estimated data in its response to the RIN for 2016. The AER also stated that if JEN is not able to provide actual information in its response to the RIN then it must provide the AER with and explanation as to:

- Why it is not able to provide actual information
- How it derived the estimate
- Why it is JEN's best estimate in the circumstances
- What actions JEN is taking to report actual data.

### 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 planning to implement 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. Consistent with the requirement set out in the AER's letter dated 14 November 2016 and described above, this basis of preparation document describes actions JEN is taking to report actual data. As at the date of this submission, JEN is currently 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.

# 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 Overheads. | Refer to the Basis of Preparation for 2.10 Overheads. | n/a |
| Capitalised Corporate Overheads | The data is sourced from template 2.10 Overheads. | Refer to the Basis of Preparation for 2.10 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.<br>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 |
| Network Overheads | The data is sourced from template 2.10 | The data is derived from 2.10 Overheads by | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | Overheads. | deducting Capitalised Network Overheads – SCS from Network Overheads – SCS. | |
| Corporate Overheads | The data is sourced from template 2.10 Overheads. | The data is derived from 2.10 Overheads by deducting Capitalised Corporate Overheads – SCS from Corporate Overheads – SCS. | n/a |
| Balancing item | The balancing item is the outcome from the reconciliation made to SCS Opex reported in the Category Analysis RIN submissions.<br>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 | This information is sourced directly from JEN's SAP ERP system. | This data is derived from a defined general ledger account as ACS Capex Overhead is not reportable under 2.10 Overheads. | n/a |
| Capitalised Corporate Overheads | This information is sourced directly from JEN's SAP ERP system. | This data is derived from a defined general ledger account as ACS Capex Overhead is not reportable under 2.10 Overheads. | n/a |
| Metering | The data is sourced from template 4.2 Metering. | Refer to the Basis of Preparation 4.2 Metering. | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| 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.<br>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 Overheads. | The data is derived by deducting Capitalised Network Overheads – ACS (that is derived from a defined general ledger account as ACS Capex Overhead is not reportable under 2.10 Overheads) from Network Overheads – ACS reporting in 2.10 Overheads. | n/a |
| Corporate Overheads | The data is sourced from template 2.10 Overheads. | The data is derived by deducting Capitalised Corporate Overheads – ACS (that is derived from a defined general ledger account as ACS Capex Overhead is not reportable under 2.10 Overheads) from Corporate Overheads – ACS reporting in 2.10 | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | Overheads. | |
| 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.<br>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);<br><br>REPLACEMENT EXPENDITURE, ASSET CATEGORY<br>Table 2.2.1 | JEN uses its Enterprise Resource Planning (**ERP**) system SAP, to capture costs associated with Repex.<br><br>SAP 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.<br><br>Capex 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.<br><br>Repex is split into sub-categories based on volume data sourced from SAP and other | Capex data is categorised per activity and service codes and are summarised into the relevant regulatory category.<br><br>SAP 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.<br><br>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.<br><br>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:<br>• Poles | N/A. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | relevant systems.<br><br>As the data is maintained within internal information systems, it is considered actual information. | • Pole top Structures<br>• OH Conductors<br>• UG Cables<br>• Service Lines<br>• Transformers<br>• Switchgear<br>• Public Lighting<br>• SCADA, Network Control and Protection Systems<br>• Other<br><br>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.<br><br>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.<br><br>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<br>Source of data: Outage Management System (**OMS**) – Outage notification report (accidental) and incident register for all except public lighting assets.<br>This data was able to be provided without estimation due to the completeness of the outage notification report (accidental).<br>For public lighting assets the data is sourced from SAP Notifications.<br>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 on. | The report is filtered by:<br>1. Year -> 2016<br>2. Outage type -> ACR (AC), Feeder (FD), Distribution Substations (DS), Low Voltage (LV), Line Fuse (LF), Premises (PR), and Switching Zone (SZ)<br>3. Primary cause of description that aligns with the definition of asset failure.<br>- Asset – Electrical Failure<br>- Asset – Mechanical Damage<br>- Asset – Rot or Termites<br>- Asset – Underground<br>- Elements – Aged and deteriorated<br>- Misc – No Identified Cause | No assumptions were made. |
| OVERHEAD CONDUCTORS BY:<br>HIGHEST OPERATING VOLTAGE; NUMBER OF PHASES (AT HV)<br>(ASSET REPLACEMENTS) | The data is sourced from JEN's internal SAP systems.<br>As the data is maintained within internal information systems, it is considered actual information. | **Extract from for calendar year 2016:**<br>JEN extracted PM Orders associated with projects linked to Overhead Conductor replacement activities (BAA-ROH, ROL, ROA) using IW39 transaction in JSAP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2016 is | Overhead Conductor was replaced in the year that it was booked to the job.<br>The length of Overhead conductor booked to the job equals the length of individual Overhead conductors replaced. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | reported as conductor replaced in 2016. 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.<br><br>Where this data was not readily available individual PM Orders and/or PS Networks were individually interrogated to determine these details.<br>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:<br>• COO-011<br>• SA0-002<br>• SBY-011<br>• SBY-014<br>• SBY-032<br>• SHM-011<br>• KLO-013<br>• KLO-021<br>• KLO-022<br>All other distribution and subtransmission feeders are designated Urban. | |
| UNDERGROUND | The data is sourced from JEN's internal SAP | **Extract from SAP for calendar year 2016:** | All Underground Cable was replaced in the year that |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| CABLES BY:<br>HIGHEST OPERATING VOLTAGE<br>(ASSET REPLACEMENTS) | systems.<br>As the data is maintained within internal information systems, it is considered actual information. | JEN extracted PM Orders associated with projects linked to Underground cable replacement activities (BAA-RUA, RUC, RUS) using IW39 transaction in JSAP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2016 is reported as cable replaced in 2016. 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.<br><br>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<br>• COO-011<br>• SA0-002<br>• SBY-011<br>• SBY-014<br>• SBY-032<br>• SHM-011<br>• KLO-013<br>• KLO-021 | it was booked to the job.<br>The length of cable booked to the job equals the length of cable replaced. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | • KLO-022<br>All other distribution and subtransmission feeders are designated Urban. | |
| TRANSFORMERS BY: MOUNTING TYPE;<br>HIGHEST<br>OPERATING VOLTAGE ; AMPERE RATING; NUMBER OF PHASES (AT LV)<br>(ASSET REPLACEMENTS) | The data is sourced from JEN's internal SAP systems.<br>As the data is maintained within internal information systems, it is considered actual information. | **Extract from SAP for calendar year 2016:**<br>JEN extracted PM Orders associated with projects linked to transformer replacement activities (BAA-RHA, RHB, RHD, RHK) using IW39 transaction in JSAP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2016 is reported as transformers replaced in 2016.<br>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.<br>Note:<br>1). JEN has deliberately put zero for the number of asset replacements in the asset category: Ground Outdoor / Indoor Chamber Mounted; >33kV & <= 66kV; >15MVA and <=40MVA. The reason for this is that expenditure has been incurred establishing the projects, however the corresponding volumes will not materialise until construction begins in 2017 and the assets are installed. | The transformers were replaced in the year that they were booked to the job.<br>The number of transformers booked to these jobs over the period in question equals the number of transformers replaced. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| SWITCHGEAR BY: HIGHEST OPERATING VOLTAGE; SWITCH FUNCTION (ASSET REPLACEMENTS) | The data is sourced from JEN's internal SAP systems.<br>As the data is maintained within internal information systems, it is considered actual information. | **Extract from SAP for calendar year 2016:**<br>**Fuse & Switch Replacement:**<br>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 transaction in JSAP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2016 is reported as fuses and switches replaced in 2016.<br>The material description was used to determine the split of switchgear items by these attributes.<br>**Circuit Breaker Replacement:**<br>JEN extracted PM Orders associated with projects linked to CB replacement activities (BAA-RSA) using IW39 transaction in JSAP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2016 is reported as circuit breakers replaced in 2016. | • The Switchgear items were replaced in the year that they were booked to the job. |
| PUBLIC LIGHTING BY: ASSET TYPE; LIGHTING | The public lighting asset replacements have also been reported in the Public Lighting Tab 4.1.<br>Public Light (luminaire) replacement work is | JEN extracted PM Orders associated with projects linked to public lights replacement activities (BAA-RLJ, RLM, RLN, RLG, RLO) using IW39 transaction in JSAP. A list of the linked equipment records and the associated equipment | |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| OBLIGATION (ASSET<br>REPLACEMENTS) | recorded using SAP Notifications. The notification is created against the specific light that requires replacement.<br><br>Public Lighting Pole replacement work is also recorded using SAP Notifications. The notification is created against the specific pole that requires replacement.<br><br>The other source of data is the monthly reports from the public lighting prime contractor.<br><br>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. | characteristics was generated. The sum of equipment with start-up date 2016 is reported as public lights replaced in 2016. | |
| SCADA, NETWORK CONTROL AND PROTECTION SYSTEMS BY:<br>FUNCTION (ASSET<br>REPLACEMENTS) | The data is sourced from JEN's internal SAP systems.<br>As the data is maintained within internal information systems, it is considered actual information. | **Field Devices (Zone Sub Relays & SCADA):**<br>JEN extracted PM Orders associated with projects linked to surge diverter replacement activities (BAA-RCA) using IW39 transaction in JSAP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2016 is reported as zone substation relays replaced in 2016. Batteries, chargers and meters are reported under this category.<br><br>Note:<br>1). JEN has deliberately put zero for the number | 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 |
|---|---|---|---|
| | | of asset replacements in the asset category: Communication Network Assets. The reason for this is that expenditure has been incurred establishing the project management and front-end design works and they are SCADA projects (MAT Code: GIS). | |
| OTHER BY: FUNCTION (ASSET REPLACEMENTS) | The data is sourced from JEN's internal SAP systems.<br>As the data is maintained within internal information systems, it is considered actual information. | **Surge Diverter:**<br>JEN extracted PM Orders associated with projects linked to surge diverter replacement activities (BAA-RXD, RXE) using IW39 transaction in JSAP. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2016 is reported as surge diverters replaced in 2016.<br>**Relocation projects:**<br>Relocation projects consist of CRB, CRE, CRP, CRR, CRS, CRU, and CRV are now reported in REPEX, previously they were in Connections. This decision aligns with JEN's EDPR submission for the new regulatory period that starts at 2016.<br>CJe0 transaction was used in JSAP to extract the number of PM orders associated to each of the WBS. The count of the PM orders is reported as the | The Surge diverter items were replaced in the year that they were booked to the job.<br>It is assumed there is correlation between number of projects and asset replacements. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | number of jobs associated to the whole WBS. | |

## 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)<br>(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 system. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2016 is reported as poles replaced in 2016. 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. | JEN 's SAP system will be updated to associate the pole category (whether it is wood or concrete) with the relevant WBS element that records the expenditure. |
| POLE TOP STRUCTURES BY:<br>HIGHEST OPERATING VOLTAGE<br>(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 | JEN extracted PM Orders associated with projects linked to Crossarm Replacement activities (RXL, RXH, RXS) using IW39 transaction in the SAP system. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2016 is reported as crossarms replaced in 2016. | 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 | JEN 's SAP 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. |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| | system into voltage (11kV or 22kV). | The functional locations linked to the PM Orders were used to determine the relevant voltage. | | and expenditure assigned to the asset group level in SAP. | |
| SERVICE LINES BY: CONNECTION<br>VOLTAGE;<br>CUSTOMER TYPE; CONNECTION COMPLEXITY<br>(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 system. A list of the linked equipment records and the associated equipment characteristics was generated. The sum of equipment with start-up date 2016 is reported as services replaced in 2016.<br>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. | JEN 's SAP system will be updated to associate the service classification (whether it is residential or commercial) with the relevant WBS element that records the expenditure. |

## 2.2.2 SELECTED ASSET CHARACTERISTICS

### Actual information

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| TOTAL POLES BY FEEDER TYPE | 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 | The assumptions are outlined in the basis of preparation for Template 5.2 – Asset Age Profile. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| OVERHEAD CONDUCTORS BY: CONDUCTOR LENGTH BY FEEDER TYPE<br><br>OVERHEAD CONDUCTORS BY: CONDUCTOR LENGTH BY MATERIAL TYPE<br><br>UNDERGROUND CABLE BY: UNDERGROUND CABLE BY FEEDER TYPE | | functional locations are consistent with the STPIS definition of urban/rural feeders, as per the definitions provided in the RIN. | There were no additional assumptions made in determining the asset volumes by asset group. |
| (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 STPIS definitions of a Rural Short and Urban Feeder has been used, consistent with the definitions provided in the RIN.<br>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 |
|---|---|---|---|
| | The data is sourced from project cost line item reports from JEN's internal SAP systems. JEN had completed upgrading its SAP system in 2016 to improve the reporting capabilities in a number of areas.<br>As the data is maintained within internal information systems, it is considered actual information. | | |
| TRANSFORMERS BY: TOTAL MVA – replaced<br>(Asset volumes currently<br>in commission)<br>Total MVA – disposed of (asset volumes currently in commission) | The data is sourced from project cost line item reports from JEN's internal SAP systems.<br>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 2016. | 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 2016 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.<br>Augex project costs incurred in 2016 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:<br>• 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).<br>• 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.<br>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.<br>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 2016. | 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 1 material zone substation project closed in 2016.

### 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 |
| Capacitors (expenditure) | Amount sourced from the relevant invoice. | The amount is escalated to 2016 dollars. | N/A |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Installation Labour (expenditure) | Cost data as extracted from SAP. | *'Project life-to-date cost by cost element'* report is first generated from SAP. Cost elements are then classified into:<br>• Direct Labour;<br>• Direct Material;<br>• Direct Contractor;<br>• Direct Other;<br>• Network Overhead; and<br>• Corporate Overhead.<br>This is the total direct labour costs as generated by the report above.<br>The annual amount of direct labour costs are escalated to 2016 dollars and then aggregated. | This total direct labour costs are internal labour costs, where JEN staff time-write their costs to the project. Therefore, the total direct labour costs would include non-installation labour costs for the project.<br>It is assumed that the non-installation internal labour costs assigned to the project would be similar in magnitude to external installation labour costs. Detailed information on external installation labour cost is not available. |
| Installation Labour (volume) | Data as extracted from SAP. | This is the number of hours (normal time and overtime) listed in the *'project life-to-date cost by cost element'* report stated above. | As above. |
| Civil works (expenditure) | Cost data as extracted from SAP. | Civil works for this project were carried out through external contract. Therefore, direct contract costs in relation to civil works captured in the *'project life-to-date cost by cost element'* are extracted from SAP.<br>The amount is then escalated to 2016 dollars. | N/A |
| Other direct (expenditure) | Cost data as extracted from SAP. | This is the sum of Direct Other and the residual of Direct Contractor (after accounting for Civil Works).<br>The annual amount is then escalated to 2016 dollars and aggregated. | N/A |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Total direct expenditure ('actuals' workbook) | The total direct expenditure shown in JEN's 'actuals' workbook is determined by a locked formula pre-populated by the AER, which displays the sum of direct expenditure categories reported in the workbook. JEN advises that the value shown in its actuals workbook is incorrect, due to the fact that JEN has also reported estimated expenditure at a category level in its 'estimates' workbook.<br>JEN has extracted all cost data for the East Preston Zone Substation project from SAP, and can advise that the total direct expenditure for this project is $6,497,758, and that this is the value that should be displayed in the 'actuals' workbook. This value is reflected in JEN's 'consolidated' workbook. | | |
| Land and easement | The zone substation is built on land already owned by JEN. Therefore, no new land or easement was procured to house the zone substation. | 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 |
|---|---|---|---|---|---|
| Transformers (expenditure) | This data is not available in JEN's SAP system. | This data is not able to be dawn directly out of JEN's SAP system. A cost element which did not have any text description was sourced from *'Project life-to-date cost by cost element'* report for this project, and this amount is assumed to reflect the transformer expenditure. The amount of the cost element is consistent with the expected price range of a transformer. | The unlabelled cost element refers to transformer expenditure. | JEN is unaware of a superior estimation method. | JEN endeavours to enhance its data capture within its SAP system including availability of high cost procurement items such as zone substation transformers and switchboards. This will enable reporting of actuals in future RIN responses. |
| Switchgear (expenditure) | This data is not available in JEN's SAP system. | Switchgear is not a single piece of equipment but the combination of a few.<br>The absence of text description for a number | The variance between total actual project cost and Gate 3 cost estimate is only 2%. It is | JEN is unaware of a superior estimation method. | JEN endeavours to enhance its data capture within its SAP |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| | | of cost elements in SAP has made the identification of costs associated with Switchgear difficult.<br>Therefore, the cost estimate from Gate 3 (within JEN's project governance framework) documentation for the project has been used. | therefore assumed that the estimated cost for switchgear would not be materially different from the actual costs. | | system including availability of high cost procurement items such as zone substation transformers and switchboards. This will enable reporting of actuals in future RIN responses. |
| Other Plant (expenditure) | This data is not available in JEN's SAP system. | Expenditure for Other Plant is the residual amount of total direct material costs after accounting for the expenditure for transformers, switchgear and capacitors.<br>With the cost for transformers and switchgear being estimates, this residual amount of total direct material costs has therefore become an estimate. | N/A. | JEN is unaware of a superior estimation method. | JEN endeavours to enhance its data capture within its SAP system including availability of high cost procurement items such as zone substation transformers and switchboards. This will enable reporting of actuals in future RIN responses. |
| Total direct expenditure ('estimates' workbook) | The total direct expenditure shown in JEN's 'estimates' workbook is determined by a locked formula pre-populated by the AER, which displays the sum of direct expenditure categories reported in the workbook. JEN advises that the value shown in its estimates workbook is incorrect, due to the fact that JEN has also reported actual expenditure at a category level in its 'actuals' workbook.<br>JEN has extracted all cost data for the East Preston Zone Substation project from SAP, and can advise that the total direct expenditure for this project is $6,497,758, and that this is an actual value. The total direct expenditure for this project in the 'estimates' workbook should therefore be shown as zero. | | | | |

## 2.3.2 AUGEX ASSET DATA – SUBTRANSMISSION LINES

JEN had no material subtransmission line projects or any subtransmission line land purchase or easement projects which were closed off in 2016. JEN had only 1 non-material project which was closed in 2016.

### Actual information

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Years incurred | These were the years in which the projects reported had any expenditure incurred in accordance with the breakdown from JEN's SAP system. | The total direct cost split by year was used to determine the years of expenditure. | None |
| Total non-material project expenditure | Cost data as extracted from SAP. | The annual direct costs of the non-material project are converted into 2016 dollars and then aggregated. | None |

# 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.<br>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. | Both thermal uprating and re-conductoring are treated as upgrades. |
| 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.<br>Note that the as incurred expenditure in 2.3.3 Cost Metrics will not align with the | Both thermal uprating and re-conductoring are treated as upgrades. |

| 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.<br>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. | |

## 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.<br>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.<br>Where there were parts of a project's cost |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | This percentage split is then applied to the actual project costs incurred in 2016 to determine overhead and underground costs.<br>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. | 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.<br>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.<br>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.<br>For projects without settlement rules recorded in SAP (e.g. projects not yet completed), an estimate has been used.<br>Also, JEN's SAP does not separately report the type of LV feeders (overhead/underground) or the type of distribution substation (pole/ground/indoor).<br>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.<br>For classifying distribution substation type, Geographical Information System data or concept design documents | It is assumed that the business case data or cost estimates accurately reflect the actual proportions of underground or overhead expenditure in each project.<br>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 |
|---|---|---|---|
| | | have been used.<br>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<br>(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:<br>• DOA – Subtransmission Line;<br>• DSH/DSI – HV Feeder;<br>• DZA/DZC – Zone Substation;<br>• PRA – other augex; and<br>• 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 system to capture costs associated with Connections.<br>SAP 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.<br>Categorisation is based on activity/service category codes (MAT 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.<br>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:<br>• Residential: CDA, CMU, CMV, CMZ, VM9, VMM, VMS, VMW, VMX<br>• Commercial/Industrial: CBE, CSO, CSU, CBG, CBI, CBK, CBL, CBP, CBH<br>• Subdivision: CHL, CHH | N/A |
| Volumes (0's) | The source of customer connection | The service orders are created at the time of the | N/A |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| • Residential – Underground connections<br>• Residential – Overhead connections<br>• Commercial/Industrial – Underground connections<br>• Commercial/Industrial – Overhead connections | information is SAP ISU (AMI) and SAP ERP (non-AMI).<br>This data is based on actual service orders by date, category and service class. | connection request.<br>The date, category and service class are confirmed at the completion of the work.<br>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. | |
| Volumes (MVA added)<br>• Residential – Distribution substation installed<br>• Commercial/industrial – Distribution substations installed<br>• Subdivision – Distribution substation installed | The source of the data is SAP.<br>The data is based on the actual MVA nameplate rating of the substations posted to the SAP projects during the period. | Extract, from SAP, material posted to connections projects closed in the year.<br>The MVA description is included the SAP material extract.<br>Added capacity is allocated to each category (residential, commercial/industrial, subdivision) based on each project's WBS Activity Code. | N/A |
| Volumes (0's)<br>• Residential – Distribution substations installed<br>• Commercial/Industrial – Distribution substations installed<br>• Subdivision – | The source of the data is SAP.<br>The data is based on the actual number of substations posted to the SAP projects during the period. | Extract, from SAP, material posted to connections projects closed in the year.<br>The MVA description is included in the SAP material extract.<br>Volume of distribution substations added is allocated to each category (residential, commercial/industrial, subdivision) based on each | N/A. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Distribution substations installed | | project's WBS Activity Code. | |
| Expenditure ($)<br>• Residential – Augmentation LV | Cost as generated from JEN's SAP system. | Different types of connection cost are captured under specifically assigned MAT codes.<br>Costs of the relevant MAT codes are then grouped into appropriate categories.<br>For residential customers, the relevant MAT codes are as listed below. All these MAT codes involve minor augmentation on LV network for residential customers only. Therefore, all the costs are then allocated to Residential – Augmentation LV.<br>• CDA<br>• CMU<br>• CMV<br>• CMZ<br>• VM9<br>• VMM<br>• VMS<br>• VMW<br>• VMX | N/A |
| Expenditure ($)<br>• Residential – Distribution substation installed<br>• 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.<br>Therefore, no work of this nature has been carried out and no expenditure has been incurred. | N/A |
| Expenditure ($) | There are no recorded costs incurred for JEN | N/A | N/A |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| • Embedded generation – distribution substation installed<br>• Embedded generation – augmentation LV<br>• Embedded generation – augmentation HV | for embedded generation connections. | | |
| Residential<br>• Volume of GSL breaches for residential customers<br>• 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<br>• 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 |
| Volumes (0's)<br>• Embedded generation – Underground connections<br>• 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.<br>The overhead/underground allocation is from JEN's GIS system. | Embedded generation connections are recorded in SAP ISU with the date installed.<br>The GIS Applications team extracted all embedded generators, and their associated NMI and installed date, from SAP ISU (reported using EG BI Report). This report was then filtered on the 'Installed_Date' for the desired year.<br>Details on whether the embedded generator was connected underground or overhead were extracted from GIS by matching the NMI of EG connections with the LV service class in GIS. For connections with a blank LV service class the LV | N/A. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | service class was identified visually by searching the connection point address on Google Earth.<br>HV connections are reported to the Network Capacity and Planning team. No HV connections were made during the desired reporting period. | |
| Volumes<br>• Embedded generation – Distribution substation installed (MVA)<br>• Embedded generation – Distribution substations installed (0's)<br>• Embedded generation – Augmentation HV (net circuit km added)<br>• Embedded generation – Augmentation LV (net circuit km added) | There are no recorded materials incurred for JEN for embedded generation connections. | 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 |
|---|---|---|---|---|---|
| Volume (0's) –<br>Residential – Mean days to connect residential customer with LV single | This is an estimate because the mean days to connect value required manual elimination of | 2016 connections were extracted from JEN's AMI SAP system.<br>An initiated date is assigned when the service order is sent via the B2B system. | The completion date is calculated from the day JEN's system receives the B2B service order request. It is assumed that | It is considered to be the best estimate as this is the mean days to connect a | Set up a BI report that extracts the required subset of data and |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| phase connection | exceptions based on investigation and individual interpretation of outliers such as nil, negative and overly long (100) number of days to connect. In previous years this data was entered into and sourced from JEN's, now decommissioned, CIS+ system. | When the service order is physically completed or cancelled, a completed date is assigned.<br>The volume of connections was filtered by customer type to include only residential customer connections.<br>Outliers, such as nil, negative and any overly long (100) number of days to complete a connection, were then manually excluded from the extracted data set.<br>Three phase connections were then filtered and excluded from the remaining data set.<br>The mean days is calculated as the number of days from connection initiation to completion, averaged over the remaining data set. | outliers were ill recorded when entered into the AMI SAP system, or that supporting paperwork was received at a date later than the service order request. These have therefore been removed from the averaged data. | single phase LV residential customer in 2016, with outliers (expected recording errors) excluded. JEN is unaware of a superior estimation methodology given the obvious recording errors in the complete data set extracted from AMI SAP. | appropriately excludes exceptions/outliers based on a set of defined rules, to avoid manual manipulation of extracted data, which leaves it open to interpretation. |
| Volumes (0's)<br>• Subdivision – Underground connections<br>• Subdivision – Overhead connections | Although the number of pits installed are actual data extracted from SAP, these two variables are considered an estimate because the number of connections is 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 SAP service codes CHH and CHL) multiplied by a factor of 1.7. On average, each pit services 1.7 connections.<br>Refer to variable "Expenditure ($)<br>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. | Add a field in GIS to capture the number of pits per lot and record the number of connections the pit is likely to supply.<br>Once the number of connections per pit per lot is known, this variable will become an actual as SAP transaction CJI3 provides the costs by project category by year |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| | | | | | and also provides the numbers of pits posted during this period. |
| Volumes (net circuit km added)<br>• Residential – Augmentation HV<br>• Residential – Augmentation LV<br>• Commercial/Industrial – Augmentation HV<br>• Commercial/Industrial – Augmentation LV<br>• Subdivision – Augmentation HV<br>• Subdivision – Augmentation LV | Some conductor/cable types are used for both LV and HV. The source of the data is SAP, and SAP is set up to report material based only on conductor/cable type, not specific use.<br>Additionally, JEN does not update SAP at project completion to confirm the actual conductor/cable length added, as opposed to the material posted to SAP projects.<br>Although GIS is the asset database and includes records of conductor/cable lengths installed, there is no relationship between SAP projects and the length/use of conductor/cable installed. | Extract, from SAP, material posted to connection projects closed in the year.<br>The conductor/cable length posted is included the SAP material extract.<br>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;<br>• 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.<br>It has been assumed that for HV overhead conductor;<br>• any conductor less than or equal to 19/2mm and 7/4.50mm would be classified as HV.<br>It has been assumed that for LV underground cable;<br>• 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.<br>It has been assumed that for LV overhead conductor;<br>• 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 JSAP when the equipment record is created / updated on the PM Order.<br>Record the actual volume (length) of the cable or conductor in SAP.<br>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 ($)<br>• Commercial/Industrial - Augmentation LV<br>• Commercial/Industrial - Augmentation HV<br>• 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.<br>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.<br>• C&I augmentation LV is made up of the following:<br>– 100% of *'C&I Simple Connection LV'* costs; and<br>– 9% of *'C&I Complex Connection HV (customer connected at LV)'* costs<br>• C&I augmentation HV is made up of the following:<br>– 18% of *'C&I Complex Connection HV (customer connected at LV)'* costs; and<br>– 100% of *'C&I Complex Connection HV (customer connected at HV)'* costs<br>• C&I distribution substation installed is made up of 73% of *'C&I Complex Connection HV (customer connected at LV)'* costs.<br>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 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 PM Orders.<br>Ensure "operating voltage" is assigned to the relevant equipment in GIS and JSAP when the equipment record is created / updated.<br>Add operating voltage on the existing equipment records in JSAP (where missing).<br>Set up a report that joins the data set from the equipment cost report in JSAP, 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 ($)<br>• Subdivision - Augmentation LV<br>• Subdivision - Augmentation HV<br>• 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.<br>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.<br>• Subdivision augmentation LV is made up of the following:<br>– 100% of *'Subdivision complex connection LV'* costs; and<br>– 30% of *'Subdivision complex connection HV'* costs.<br>• Subdivision augmentation HV is made up of 40% of *'Subdivision complex connection HV'* costs.<br>• 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 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 PM Orders.<br>Ensure "operating voltage" is assigned to the relevant equipment in GIS and JSAP when the equipment record is created / updated.<br>Add operating voltage on the existing equipment records in JSAP (where missing).<br>Set up a report that joins the data set from the equipment cost report in JSAP, relevant MAT code, relevant projects based on MAT code, and aggregates the cost |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| | | | | | by equipment for each connection category. |
| Expenditure ($)<br>• 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.<br>The lots per pit factor as determined from the average connections per pit for the period 2009 to 2013.<br>This lots per pit factor was determined by extracting from GIS all of the External Plan References (**XPR**) installed between 2009 and 2013.<br>An XPR is a polygon in the GIS that covers the extents of the design drawing.<br>All underground pits that were inside or touching each XPR were extracted.<br>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.<br>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.<br>SAP 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.<br>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 ($)<br>• Residential – Simple connection LV | Cost as generated from JEN's SAP system. | Connection costs (excluding overheads) of different nature are captured under a variety of MAT codes.<br>Costs of the relevant MAT codes are then grouped into the appropriate categories. See notes on Residential Augmentation LV. | N/A |
| Expenditure ($)<br>• Residential – Complex connection LV<br>• 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.<br>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 ($)<br>• Commercial/Industrial – Simple connection LV<br>• Commercial/Industrial – Complex connection HV (customer connected at HV)<br>• Commercial/Industrial – Complex connection sub-transmission | Cost as generated from JEN's SAP system. | Costs of the relevant MAT codes are then grouped into the appropriate categories.<br>• Commercial – simple connection LV: sum of the costs captured in the MAT codes of CBE, CSO and CSU;<br>• Commercial – complex connection HV (cust. connected at HV): cost captured under the MAT code of CBH; and<br>• 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.<br>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 |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Expenditure ($)<br>• Subdivision –Complex connection LV<br>• Subdivision – Complex connection HV (no upstream asset works)<br>• Subdivision – Complex connection HV (with upstream asset works) | Cost as generated from JEN's SAP system. | Costs of the relevant MAT codes are then grouped into the appropriate categories.<br>• Subdivision – complex connection LV: cost captured under the MAT code of CHL;<br>• Subdivision – complex connection HV (no upstream asset works): cost captured under the MAT code of CHH; and<br>• Subdivision – complex connection HV (with upstream asset works): N/A.<br>JEN does not have any recorded costs for Subdivision – complex connection HV (with upstream asset works). It is therefore determined that no cost has been incurred for this category. | N/A |
| Expenditure ($)<br>• Embedded Generation – Simple connection LV<br>• Embedded Generation – Complex connection HV (small capacity)<br>• 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 |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Volumes (0's)<br>• Residential – Simple connection LV<br>• Residential – Complex connection LV<br>• Residential – Complex connection HV | Volume is taken from SAP ISU and SAP ERP. The volume split (simple, complex, LV, HV etc.) is from SAP, 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.<br>Note that the SAP project count does not match the number of connections because most projects cover multiple connections, so the SAP project count is used purely to allocate connections to a particular connection type (simple/complex, LV/HV, etc.).<br>Note there are no recorded connections for residential complex HV or LV connections. | N/A. |
| Volumes (0's)<br>• Embedded Generation – Simple connection LV<br>• Embedded Generation – Complex connection HV (small capacity)<br>• 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.<br>The overhead/underground allocation is from JEN's GIS system. | Embedded generation connections are recorded in SAP ISU with the date installed.<br>The GIS Applications team extracted all embedded generators, and their associated NMI and installation date, from SAP ISU (reported using EG BI Report). This report was then filtered on the 'Installed_Date' for the desired year.<br>Details on whether the embedded generator was connected underground or overhead were extracted from GIS by matching the NMI of EG connections with the LV service class in GIS. For connections with a blank LV service class the LV service class was identified visually by searching the connection point address on Google Earth.<br>HV connections are reported to the Network Capacity and Planning team. No HV connections were made during the desired reporting period. | N/A |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Volumes (0's)<br>• 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 ($)<br>• Commercial/Industrial – Complex connection HV (customer connected at LV, minor HV works)<br>• 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 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).<br>This estimate is formed | 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.<br>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.<br>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.<br>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 by type will be extracted from SAP ISU.<br>The NMI information can be added to GIS which stores the information of the assets per project.<br>Develop a BI report that takes the data set from SAP ISU (NMI information), asset details from GIS and costs per |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| | | based on an engineering judgment. | | | connection by voltage type from SAP. |
| Volume (0's)<br>• Commercial/Industrial – Simple connection LV<br>• Commercial/Industrial – Complex connection HV (customer connected at LV, minor HV works)<br>• Commercial/Industrial – Complex connection HV (customer connected at LV, upstream asset works)<br>• Commercial/Industrial – Complex connection HV (customer connected at HV)<br>• Commercial/Industrial – Complex connection sub-transmission | Although the number of 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. | The total number of connections has been allocated between subcategories according to proportional expenditure attributed to each subcategory. | The assumption is that the number of projects in each activity code is representative of the number of connections performed under each sub category. | This is the best estimate available with the information currently collected in the SAP systems.<br>JEN is unaware of a superior estimation methodology. | |
| Volumes (0's)<br>• Subdivision – Complex connection LV<br>• 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 is estimated based on the actual number of pits installed (using GIS | 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.<br>JEN is unaware of a superior | |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| | the number of connections are assumed to be 1.7 times the number of pits installed. | and SAP service codes CHH and CHL) multiplied by a factor of 1.7 connections per pit. On average, each pit services 1.7 connections.<br>Refer to variable "Expenditure ($)<br>Subdivision - Cost per lot" in Table 2.5.1 for how this factor is calculated.<br>SAP service code CHL represents "Subdivision - Complex connection LV", and CHH represents "Subdivision - Complex connection | | 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<br>**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.<br>Project Maintenance Orders (**PM orders**) that aggregate into Work Breakdown Structures (**WBS Elements**) (cost collectors) are set up to collect costs at 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.<br>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<br>**Capex** | This information is considered actual information as it is sourced directly from SAP.<br>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 are categorised against a particular type of asset | 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.<br>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. | class e.g. Motor Vehicles.<br>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.<br>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<br>**Capex** | This information is considered actual information as it is sourced directly from SAP<br>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.<br>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<br>**Capex** | This information is considered actual information as it is sourced directly from SAP<br>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.<br>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 | 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'.<br>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 |
|---|---|---|---|
| | of the direct costs incurred for a WBS element. | | |
| 2.6.1 IT and Communications<br>**Opex**<br>***Non-Recurrent Expenditure*** | This information is considered actual information as it is sourced directly from SAP.<br>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.<br>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:<br>*"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)."*<br>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<br>**Opex** | This information is considered actual information as it is sourced directly from SAP.<br>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.<br>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.<br>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.<br>Direct costs like Property tax & Council rates are collected against each asset.<br>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<br>IT and Communications<br>**Opex**<br>***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 over its business units based | 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. | on various cost drivers.<br>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. | | Whilst JEN already captures the expenditure in SAP ERP using the SAP activity mapping methodology, JEN will need to empower its 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.<br>JEN will continue to improve the process of capturing the costs in the relevant regulatory category. |
| 2.6.1<br>IT and Communications<br>**Opex**<br>***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.<br>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.<br>Whilst JEN already captures the expenditure in SAP ERP using the SAP activity mapping methodology, JEN will need to empower its 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.<br>JEN will continue to improve the process of capturing the costs in the relevant regulatory category. |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual information in future |
|---|---|---|---|---|---|
| 2.6.1<br>Motor Vehicles<br>**Opex** | 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.<br>The primary source of the information inputted into SAP is via the Jemena Fleet Management Company. | 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.<br>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.<br>*Allocation of Operating Expenditure to the various Motor Vehicle categories:*<br>As SAP does not categorise fleet costs in accordance with the requirements of this template, they are allocated on a weighted average basis, calculated as follows:<br>The kilometres travelled per vehicle type divided by the total kilometres travelled by all motor vehicles per year.<br>NOTE: All vehicle and plant hours are calculated at 1 hour | JEN has made the assumption that kilometres travelled and hours of use by a vehicle type is a key cost driver of total motor vehicle expenditure. | 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.<br>Whilst JEN already captures the expenditure in SAP ERP using the SAP activity mapping methodology, JEN will need to empower its 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.<br>JEN will continue to improve the process of capturing the costs in the relevant regulatory category. |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual information in future |
|---|---|---|---|---|---|
| | | of usage equates to 50kms of travel (a practice adopted by industry and fleet management companies).<br>The average for each vehicle type thus arrived at, is then applied to the total motor vehicle operating expenditure to provide the category breakdown as required by this template.<br>The information for the average kilometres for each vehicle category is sourced from a monthly fuel usage report maintained and provided by the Fleet Management Company contracted by Jemena. | | | |

## 2.6.2. ANNUAL DESCRIPTOR METRICS – IT & COMMUNICATIONS EXPENDITURE

### Actual information

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| 2.6.2<br>**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.<br>Please refer to the basis of preparation of template 2.11. | n/a |
| 2.6.2<br>**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<br>**Number of Devices** | Number of devices reported in this template is the actual figures for the reporting period.<br>The figure reported is a composite of all of the following maintained in the list of devices and users:<br>• Personal computers (laptop and desktop)<br>• Tablets<br>• 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<br>**CAR**<br>**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<br>**CAR**<br>**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<br>**CAR**<br>**Number Leased** | n/a<br>Jemena's fleet is owned, not leased. | n/a | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| 2.6.3<br>**CAR**<br>**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<br>**CAR**<br>**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<br>**LIGHT COMMERCIAL VEHICLE**<br>**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<br>**LIGHT COMMERCIAL VEHICLE**<br>**Number** | 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 descriptions and used to calculate the number of | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| **Purchased** | | Light Commercial Vehicles purchased. | |
| 2.6.3<br>**LIGHT COMMERCIAL VEHICLE**<br>**Number Leased** | n/a<br>Jemena's fleet is owned, not leased. | n/a | n/a |
| 2.6.3<br>**LIGHT COMMERCIAL VEHICLE**<br>**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<br>**LIGHT COMMERCIAL VEHICLE**<br>**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<br>**ELEVATED WORK PLATFORM (LCV)**<br>**Average Kilometres** | n/a<br>This is not a type of equipment used by JEN. | n/a | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| **Travelled** | | | |
| 2.6.3<br>**ELEVATED WORK PLATFORM (LCV)**<br>**Number Purchased** | n/a<br>This is not a type of equipment used by JEN. | n/a | n/a |
| 2.6.3<br>**ELEVATED WORK PLATFORM (LCV)**<br>**Number Leased** | n/a<br>This is not a type of equipment used by JEN. | n/a | n/a |
| 2.6.3<br>**ELEVATED WORK PLATFORM (LCV)**<br>**Number in Fleet** | n/a<br>This is not a type of equipment used by JEN. | n/a | n/a |
| 2.6.3<br>**ELEVATED WORK PLATFORM (LCV)**<br>**Proportion of Total Fleet Expenditure** | n/a<br>This is not a type of equipment used by JEN. | n/a | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | | |
| 2.6.3<br>**ELEVATED WORK PLATFORM (HCV)**<br>**Average Kilometres Travelled** | The information is sourced from a Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena.<br>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<br>**ELEVATED WORK PLATFORM (HCV)**<br>**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<br>**ELEVATED WORK PLATFORM (HCV)**<br>**Number Leased** | n/a<br>Jemena's fleet is owned, not leased. | n/a | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | | |
| 2.6.3<br>**ELEVATED WORK PLATFORM (HCV)**<br>**Number in Fleet** | The information is sourced from a Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena.<br>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<br>**ELEVATED WORK PLATFORM (HCV)**<br>**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<br>**HEAVY COMMERCIAL VEHICLE**<br>**Average Kilometres Travelled** | The information is sourced from a Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena.<br>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 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. | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| 2.6.3<br>**HEAVY COMMERCIAL VEHICLE**<br>**Number purchased** | The information is sourced from a Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena.<br>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<br>**HEAVY COMMERCIAL VEHICLE**<br>**Number Leased** | n/a<br>Jemena's fleet is owned, not leased. | n/a | n/a |
| 2.6.3<br>**HEAVY COMMERCIAL VEHICLE**<br>**Number in Fleet** | A Monthly Fuel Usage Report provided by the Fleet Management Company contracted by Jemena.<br>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<br>**HEAVY COMMERCIAL VEHICLE**<br>**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 2016.<br>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.<br>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.<br>Computer code is written to extract six files, they are:<br>1. List of all LV overhead mains spans (From poles and To pole) by feeder and in the LBRA<br>2. List of all HV overhead mains spans in the LBRA<br>3. List of all overhead ST spans in the LBRA<br>Files 4, 5 and 6 are the same but for spans in the HBRA.<br>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.<br>Length of overhead services from poles to premises was excluded from the route length calculation.<br>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.<br>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 2016 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.<br>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 2016 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.<br>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 2016 because the data can be directly sourced from the 2016 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 2016. | No assumptions have been made in providing this information. |

## Estimated information

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| LBRA and HBRA, Total length of maintenance spans (km) for "Urban and CBD" and "Rural" feeders | The VMS does not record the length of spans. The VMS records the pole number which represents the span closer to the zone substation from that pole.<br>This variable is also not recorded in the GIS as a characteristic against each span and therefore required to be estimated. | Using the Route Line length data the average span lengths were calculated for each of the categories (HBRA/LBRA Rural/Urban). The average span length for that category was multiplied by the number of Maintenance Spans reported from the VMS. The methodology used for the 2016 RIN submission refers to the note below.<br>i.e. Length of maintenance spans (HBRA Rural) = Average HBRA Rural span length (Route line length HBRA Rural / count of HBRA Rural spans total) x maintenance spans for this category. | All voltages are cleared in the same single visit. | This is the best estimate because it has been calculated using a programmed methodology that is able to be repeated and is considered to provide an accurate result.<br>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.<br>JEN proposes the following process to make this information actual:<br>• Request its service provider to provide the span maintained.<br>• Load this information in JEN's systems.<br>• A logic will be written within GIS to calculate the span length (km) if the span has been identified as having been maintained.<br>• The span will be classified as HBRA/LBRA and whether it is Rural or Urban. |

## 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<br>Electricity Safety (Bushfire Mitigation) Regulations 2013<br>Electricity Safety (Electric Line Clearance) Regulations 2015<br>Electricity Safety Management Scheme<br>Electricity Safety (Installations) Regulations 2009<br>AS4373 (Pruning of Amenity Trees)<br>Environment Protection and Biodiversity Conservation Act 1999<br>Flora and Fauna Guarantee Act 1988<br>Occupational Health and Safety Act<br>Occupational Health & Safety (Plant) Regulations 1995<br>Green Book - Code of Practice on electrical safety for distribution businesses in the Victorian Electrical Supply Industry<br>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<br>JEN Bushfire Mitigation Plan<br>JEN Customer Complaints Procedure<br>VEM 20-50 Assessment Procedure (Jemena)<br>VEM 10-05 Safety Observer/Offsider, Emergency Response & Single Person Work Procedure<br>VEM 10-09 Guidelines for Conforming to Electrical Safety Requirements<br>VEM 10-08 EWP Procedure<br>VEM 10-06 Tree Climbing Procedure<br>HSP 05-13 Working at Heights |

| Requirement | Response |
|---|---|
| | VEM 21-03 Management of Threatened Flora and Fauna<br>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;<br><br>**Literal compliance**<br>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.<br><br>**Habitat Trees**<br>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.<br><br>**Consultation**<br>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.<br>Vegetation program management costs are also increasing due to increasing customer expectations. This has resulted in additional consultation with customers, community groups and councils.<br><br>**Service Lines**<br>There is an increased focus on the management and clearing of service lines (section 84(2)(a) of the Electricity Safety Act). |

| Requirement | Response |
|---|---|
| | 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.<br>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.<br><br>**Other Responsible Person (ORP) Follow Up**<br>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.<br>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.<br>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.<br><br>**Step Changes applicable to Electricity Safety (Electric Line Clearance) Regulations 2015 (2015 ELC regulations)**<br>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.<br>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.<br>Additional notification and consultation obligations introduce an increase in costs which are driven both by the increase in the |

| Requirement | Response |
|---|---|
| | 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.<br>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.<br>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.<br><br>**HSE**<br>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.<br><br>**Victorian Bushfires Royal Commission (VBRC) Recommendations**<br>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.<br>*RECOMMENDATION 30*<br>*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.*<br>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.<br>*RECOMMENDATION 31*<br>*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.*<br>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 |

| Requirement | Response |
|---|---|
| | program.<br>*RECOMMENDATION 34*<br>*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.*<br>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)<br><br>LBRA and HBRA, Inspection ($0's)<br><br>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.<br>Reports are run directly from SAP and validated by VMS.<br>(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.<br>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 | JEN has not initiated any ground clearance programs. This data is captured by the | This information was recorded in SAP and validated by data provided by the vegetation management | No assumptions have been made in providing this information. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| ($0's) | vegetation management company. | company using reports from the VMS. | |
| 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 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, 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. |

## 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.<br>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.<br>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.<br>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.<br>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.<br>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.<br>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) | This data was sourced from reports prepared for the AER in accordance with the F-factor scheme requirements.<br>This data is considered actual because it is | 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 | 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 |
|---|---|---|---|
| (0's) | materially dependent on JEN's business records. | fire start variables. | If the data is unclear who the Responsible Person is for electric line clearance then JEN is assumed to be the Responsible Person. |

# 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.<br>This data was provided without estimation due to the completeness of JEN's age profile data. | For All Assets:<br>Sum of all assets as per asset category at the respective year end 2016.<br>Zone substation – other equipment is made up of the following asset types:<br>• Zone Substation Circuit Breaker<br>• Zone Substation Capacitor bank<br>• Zone Substation Current Transformer<br>• Zone Substation Voltage Transformer<br>• Zone Substation RTU<br>• Zone Substation NER<br>• Zone Substation Battery Charger<br>• Zone Substation Battery | No assumptions have been made. |
| ASSET QUANTITY - INSPECTED/ | Information is sourced from SAP. Reference was made to the appropriate SAP Plant Maintenance (PM) Orders that were assigned to the | The method included analysing all of the SAP Plant Maintenance (PM) Orders that were assigned to the relevant maintenance activity | No assumptions have been made. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| MAINTAINED | maintenance activity. | codes.<br>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.<br>The total in this category comprises the number of assets being maintained and also inspected in 2016. | |
| 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.<br>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.<br>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. | No assumptions have been made. |

## 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.<br><br>As expenditure is incurred, it is captured in PM Orders (cost collectors). PM Order codes can be used to identify various maintenance activities.<br><br>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.<br><br>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.<br><br>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.<br><br>Reserve feeder costs are calculated based on related activities and are validated by experienced engineers. | JEN has a comprehensive model which underpins the maintenance costs disclosed in the RIN responses and previous Regulatory Accounting Statements.<br><br>This model identifies the Direct Labour, Direct Materials, Contractor and Other Costs based on allocations from SAP. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | 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.<br>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.<br>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.<br>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. | |
| POLE TOP, OVERHEAD LINE & SERVICE LINE MAINTENANCE | As per general comment above. | The list of SAP activities include:<br>• MOL Straightening Leaning Poles<br>• MOM O/H Line Maintenance. – Pole Top Structures<br>• MOS Overhead Service Adjustment<br>• MOT Pole Top And O/H Repair Thermal Survey<br>• NIH Supply Abolishment<br>• NOD Service Inspection | As per general comment above. |
| POLE INSPECTION AND TREATMENT | As per general comment above. | The list of SAP activities include:<br>• NOA Overhead Asset Inspection<br>• NPA Pole Inspection<br>• NPD Termite Treatment | As per general comment above. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | 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. | |
| OVERHEAD ASSET INSPECTION | As per general comment above. | The list of SAP activities include:<br>• MHT Distribution Substation Thermal Survey<br>• NOC Line Switch Minor Adjustment<br>• NOF Subtransmission/Feeder Thermal Surveys | As per general comment above. |
| NETWORK UNDERGROUND CABLE MAINTENANCE: BY VOLTAGE AND BY LOCATION<br>LV - 11 TO 22 kV<br>33 kV AND ABOVE<br>CBD OR NON-CBD | As per general comment above. | The list of SAP activities include:<br>• MUB Pits Maintained<br>• MUE Pillar Inspection<br>• MUG Pillar Maintenance<br>• MUH Pillar Defects<br>• MUI LV Cable And Joint Repairs<br>• MUJ HV Cable And Joint Repairs<br>Note the above activities readily identify the voltage of the maintenance activity enabling appropriate category allocation.<br>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. | As per general comment above. |
| DISTRIBUTION SUBSTATION EQUIPMENT, SWITCHGEAR & PROPERTY MAINTENANCE | As per general comment above. | The list of SAP activities include:<br>• MEB Transformer/Kiosk Refurbishment<br>• MHA Distribution HV Installation Maintenance<br>• MHC ACR Inspection and Maintenance<br>• MHD Distribution Substation Defects | As per general comment above. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | Maintenance<br>• MHG Distribution Substation Grounds Maintenance<br>• MHO Distribution Substation Oil Sample & Testing<br>• MHP Distribution Substation Inspection<br>• MHR Distribution Substation Maintenance<br>• MSA Distribution Switchgear Maintenance<br>• NVI Investigation Of Voltage Complaints<br>• NXS Transformer Load Testing<br>• NOB Line Switch Insp. and Functional Test<br>• NOE Earth Testing | |
| ZONE SUBSTATION EQUIPMENT MAINTENANCE | As per general comment above. | The list of SAP activities include:<br>• MZA Zone Substation Equipment Maintenance Primary<br>• MZC Zone Substation Defect Maintenance Primary<br>• MZI Zone Substation Inspection & Audits<br>• MEA Refurbishment of Rotable Equipment | As per general comment above. |
| SCADA & NETWORK CONTROL MAINTENANCE | As per general comment above. | The list of SAP activities include:<br>• ADC Planned Maintenance-SCADA<br>• ADD Corrective Maintenance - SCADA<br>• MZE Zone Subs. Maint. - Communications<br>• 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:<br>• MZB Zone Substation Equipment Maintenance Secondary | As per general comment above. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | • MZD Zone Substation Defect Maintenance Secondary | |

# 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.<br>As expenditure is incurred, it is captured in PM Orders (cost collectors). PM Order codes can be used to identify various maintenance activities.<br>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.<br>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.<br>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.<br>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.<br>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**).<br>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.<br>Reserve feeder costs are calculated based on related activities | The primary purpose of these activities is for maintenance and emergency works.<br>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 |
|---|---|---|---|
| | | and are validated by experienced engineers.<br>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.<br>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.<br>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.<br>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 2016 and therefore these variables are not applicable to Jemena for the 2016 regulatory year. | N/A | N/A |
| (C) MAJOR EVENT DAYS O&M EXPENDITURE ($0's) | Information is sourced from SAP.<br>As expenditure is incurred, it is captured in PM Orders (cost collectors). PM Order codes can be used to identify various maintenance activities.<br>Network overheads and motor vehicle operating expenses have been removed for this template, as the requirement is to disclose direct costs only.<br>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.<br>The MED threshold has been calculated for the 2016 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.<br>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.<br>The single major event day for 2016 was 9 October 2016. | | accordance with the RIN template guideline. |

### Estimated information

No estimated information is provided.

# 2.10 OVERHEADS

## 2.10.1 NETWORK OVERHEADS EXPENDITURE

### Actual information

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Network Overheads:<br>• Advertising/ Marketing<br>• GSL payments | The following items are disclosed as actual information as they are sourced from JEN's response to the Economic Benchmarking RIN (see AER defined variable codes in the Economic Benchmarking RIN template for variables DOPEX0114 DOPEX0120) or a GL account:<br>• Advertising /Marketing<br>• GSL payments | JEN's cost collection process uses SAP functionality to collect costs into WBS elements at the macro level. Planned Maintenance (**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. SCS, Public Lighting, Metering, Ancillary Services and Unregulated.<br>JEN uses time writing to capture internal labour costs. Where practical and appropriate, all employees time write to a PM order/activity or to a client e.g. JEN. External supplier costs are captured by receipting costs against Jemena issued purchase orders that identify the appropriate cost collector. 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. | N/A |

### Estimated information

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| Network Overheads Expenditure (Includes Network | Although JEN does not directly collect costs at the level of the categories specified for Network Overheads Opex, JEN's experienced personnel have | 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 | The underlying data in JEN's costs collectors is accurate. | JEN is unable to apply 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 |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| Overheads Opex and Capitalised Network Overheads):<br>• Network management<br>• Network planning<br>• Network control and operational switching<br>• Quality and standard functions<br>• Project governance and related functions<br>• Other | reviewed the underlying project cost data, and mapped them into the respective six regulatory categories, in accordance with the definitions provided in the RIN. Therefore the Network Overheads Opex costs split into the six regulatory subcategories are actuals.<br><br>However as JEN does not record Capitalised Network Overhead costs in the six mandatory subcategories as required by the RIN and therefore JEN provided its best estimate to categorise these costs.<br><br>Network Overhead subcategory amounts are estimates because they include estimated Capitalised Network Overhead subcategory data. | 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. SCS, Public Lighting, Metering, Ancillary Services and Unregulated.<br>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 into by receipting costs against Jemena issued purchase orders that identifies the appropriate cost collector.<br><br>**Overhead Expenditure Before Allocation – Standard Control Services (Gross including capitalised overheads)**<br>*Network Overheads (Operating Expenditure):*<br>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. JEN's experienced personnel have reviewed the underlying project cost data, and mapped them into the six regulatory categories, in accordance with the | | | necessary to report actual information in the future.<br><br>JEN proposes the following process to make this information actual:<br>• Updating JEN's SAP system to record Capitalised Network Overheads in the six subcategories required by the AER.<br>• Alternatively, the cost inputs into the calculation of Capitalised Overhead rates will be mapped to the relevant six subcategories required by the AER. |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| | | definitions provided in the RIN.<br><br>*Capitalised Overheads:*<br>JEN capitalises a portion of its overheads, sourced from the network type activities (generally Operational and Asset Management in nature). JEN continues to improve its methodology of overhead capitalisation.<br><br>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:<br>*Direct Budget Overheads ÷ Total Budget Capex Program = Percentage of Applied Overhead*<br>Examples of these are:<br>– Direct Support Activities (**DSA**) 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 are then distributed over the specific cost collectors usually based on the underlying direct costs of the respective cost collectors. | | | |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| | | Network overheads are reported under the six mandatory categories defined in the RIN. JEN's experienced personnel reviewed the underlying cost data, and mapped them into the respective regulatory categories.<br><br>**Overhead before allocation – alternative control services (Gross including capitalised overheads)**<br>Alternate control service (**ACS**) network overheads operating expenditure is derived by extracting JEN's financial transactions from SAP. Each of these transactions is classified into the regulatory categories of this template by referring to either the project code or the general ledger account it is charged to. The mapping of WBS elements is cross-checked against an Investment Management System (**IMS**) mapping table for accuracy. JEN's experienced personnel have reviewed the underlying cost data, and mapped them into the six regulatory categories, in accordance with the definitions provided in the RIN.<br><br>*Capitalised overheads*<br>Discussed above. | | | |
| Capitalised Network Overheads | JEN does not record Capitalised Network Overhead costs in the six mandatory subcategories as required by the RIN and | Refer to Network Overheads Expenditure above. | The underlying data in JEN's costs collectors is accurate. JEN has | JEN is unable to apply a superior estimation technique. | Refer to Network Overheads Expenditure above. |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| | therefore JEN provided its best estimate to categorise these costs | | not duplicated capitalised overheads in this template. | | |

## 2.10.2 CORPORATE OVERHEADS EXPENDITURE

### Actual information

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Office of the CEO | Corporate overhead are actuals that reconcile with the Enterprise Support Function allocation which forms part of the audited annual RIN. | Corporate overheads are recorded at a cost centre level or in a specific project at the source of origination Jemena Asset Management Ltd (**JAM**). Corporate overheads charged to JEN from JAM are recorded in designated projects within JEN. Each corporate overhead accounting record within relevant JEN projects in SAP contain the details of the related JAM cost centre or specific project.<br>Projects that capture the costs of functions of the Office of the CEO, such as executive oversight and board liaison on asset and financial management and stakeholder relations, have been recorded under this variable.<br>The total of Office of the CEO expenditure has an ACS and SCS allocation in accordance with JEN's AER approved CAM | N/A |
| Finance | Corporate overhead are actuals that reconcile with the Enterprise Support Function allocation which forms part of the audited annual RIN. | 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 within relevant JEN projects in SAP, contain the details of the related JAM cost centre or specific project.<br>Projects that capture the cost of Finance functions as listed below have been recorded | N/A |

| | | | |
|---|---|---|---|
| | | under this variable:<br>– Executive oversight of overall financial management;<br>– Management of budgeting, forecasting, management reporting and analysis, shareholder reporting and analysis, statutory reporting and analysis, regulatory reporting and analysis, systems, and technical accounting;<br>– Management of portfolio decisions, capital structure, and monitoring of performance;<br>– Management of tax planning and advice; tax risk; and tax compliance;<br>– Management of accounts payable, accounts receivable, payroll, financial systems, fixed assets accounting, journals and reconciliations, and treasury back office;<br>– Management of internal audits; and<br>– Management of business planning and continuous improvements.<br>The total Finance expenditure has an ACS and SCS allocation in accordance with JEN's AER approved CAM. | |
| Legal and Secretariat | Corporate overhead are actuals that reconcile with the Enterprise Support Function allocation which forms part of the audited annual RIN. | 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 within relevant JEN projects in SAP, contain the details of the related JAM cost centre or specific project.<br>Projects that capture the costs of functions of Legal and Secretariat activities given below have been recorded under this variable:<br>– Management and advice on economic regulation, environmental law, employment law, property law, and company law; and<br>– Company secretariat.<br>The total Legal and Secretariat expenditure has an ACS and SCS allocation in accordance with JEN's AER approved CAM. | N/A |
| Human Resources | Corporate overhead are actuals that reconcile with the Enterprise Support Function allocation which | 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 within | N/A |

| | | | |
|---|---|---|---|
| | forms part of the audited annual RIN. | relevant JEN projects in SAP, contain the details of the related JAM cost centre or specific project.<br>Projects that capture the costs of the functions of Human Resources given below have been recorded under this variable:<br>– Management of recruitment and remuneration benefit services;<br>– Management of employee HSE training, performance, quality and environmental performance; and<br>– Management of communications to employees.<br>The total Human Resources expenditure has an ACS and SCS allocation in accordance with JEN's AER approved CAM. | |
| Regulatory | Corporate overhead are actuals that reconcile with the Enterprise Support Function allocation which forms part of the audited annual RIN. | 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 within relevant JEN projects in SAP, contain the details of the related JAM cost centre or specific project.<br>Projects that capture the costs of following regulatory activities have been recorded under this variable:<br>– Managing regulatory obligations and price reviews; and<br>– Consultations and regulatory relationships with governments, regulators and market operators.<br>The total Regulatory expenditure has an ACS and SCS allocation in accordance with JEN's AER approved CAM. | N/A |
| Insurance | Corporate overhead are actuals that reconcile with the Enterprise Support Function allocation which forms part of the audited annual RIN. | 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 within relevant JEN projects in SAP, contain the details of the related JAM cost centre or specific project.<br>Projects that capture the costs of insurance activities given below have been recorded under this variable:<br>– Procurement of insurance; and | N/A |

| | | | |
|---|---|---|---|
| | | – Management of risk, including for bushfire and other natural disasters.<br>The total Insurance expenditure has an ACS and SCS allocation in accordance with JEN's AER approved CAM | |
| Non-network IT support | Corporate overhead are actuals that reconcile with the Enterprise Support Function allocation which forms part of the audited annual RIN. | 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 within relevant JEN projects in SAP, contain the details of the related JAM cost centre or specific project.<br>Projects that capture the costs of providing and managing IT infrastructure and services have been recorded under this variable.<br>The total Information Technology expenditure has an ACS and SCS allocation in accordance with JEN's AER approved CAM. | N/A |

# 2.11 LABOUR

## Actual information

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| 2.11.1 - Cost Metrics per Annum | The data is sourced from:<br>• Payroll information from SAP (Spinifex)<br>• Employee classifications from SAP master data<br>• Employee timewriting information from SAP<br>• Assessment cycles from SAP.<br>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 parameter of all Jemena employees and CY16 to capture all employees that have received payment during CY16. This report shows total actual payment and hours for CY16 (leave, ordinary and overtime).<br>To determine the employees associated with JEN, Cross Application Time Sheet (**CATS**) client analysis reports from SAP BI were run for all employees by quarter. From this report, employee's direct timewriting to JEN plus assessment cycle allocation to JEN form the total quarterly allocation percentage to JEN.<br>The RIN requires labour expenditure be categorised into AER defined categories.<br>JEN further categorised its labour expenditure by providing the employee prior year data to the appropriate Managers and HR reporting analysts who reviewed and amended it to reflect CY16 employee categories as required by the template.<br>In table 2.11.1 calculations are applied to determine:<br>• TCR = base salary<br>• ASL = Average Staffing Level. One ASL is one full-time equivalent employees undertaking SCS work receiving salary or wages (Paid FTE) over the entire year.<br>The ASL is the time charged against JEN during the year converted to full time equivalent then multiplied by the time writing percentage.<br>• Total labour expenditure is labour expensed allocated to JEN<br>• Average productive work hours per ASL: | The allocation to JEN is based on time writing/assessment cycles allocation.<br>If an employee is timewriting to external project, it is deemed as non JEN project and allocated through assessment cycle.<br>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.<br>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.<br>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. | *(TCR hours + base hours-leave hours + overtime hours)/ASL* | |
| 2.11.2 - Descriptor Metrics | This table requires JEN to provide various metrics for CY16 | The methodology is as described above.<br><br>JEN provides below the formula to calculate the metrics as required by | 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 |
|---|---|---|---|
| | labour costs. The source of the information is as described above. | this template. The following are for JEN costs and JEN ASL only.<br>• Average productive work hours per ASL - ordinary time:<br>*(TCR hour + base hour-leave hour)/ASL*<br>• Average productive work hours hourly rate per ASL - ordinary time:<br>*(TCR rate + base rate-leave rate)/(TCR hour + base hour-leave hour)/ASL*<br>• Average productive work hours per ASL - overtime:<br>*Overtime hours/ASL*<br>• Average productive work hours hourly rate per ASL - overtime:<br>*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).<br>• Other earnings, on costs and taxes.<br>It includes:<br>• Ordinary time salaries and wages in the year.<br>The **Average productive work hours overtime hourly rate per ASL** excludes:<br>• All direct costs associated with non-productive hours related to overtime hours spent on standard control services.<br>• Other earnings, on costs and taxes.<br>It includes:<br>• 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<br><br>**EXPENDITURE**<br>(OPEX & CAPEX)<br><br>Global description for Actual with details contained below | Information is sourced from SAP, the ERP system that JEN uses to capture its financial information.<br><br>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.<br><br>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.<br><br>By extracting the costs from the general ledger accounts and the activity codes, costs can be categorised as:<br>• Direct material expenditure<br>• Direct labour expenditure<br>• Contract expenditure<br>• Other expenditure<br>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 is of low consequence as it was struck under an open tender process and any concerns around margins are alleviated through market testing.<br>Embedded overheads have been removed from | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | 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).<br>Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | Opex costs are derived from extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category.<br><br>The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>The cost in total agrees to 2.7 Vegetation Management under following zones:<br>• Zone 1 (LBRA)<br>• 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).<br>Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | Opex costs are derived from extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category.<br><br>The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>The cost in total agrees to 2.8 Routine Maintenance under following maintenance categories:<br>• Pole top, overhead line & service line maintenance<br>• Pole inspection and treatment<br>• Overhead asset inspection | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | • Network underground cable maintenance<br>• Distribution substation equipment & property maintenance<br>• Zone substation equipment maintenance<br>• Zone substation property maintenance<br>• Public lighting maintenance<br>• Scada & network control maintenance<br>• 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).<br>Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | Opex costs are derived from extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category.<br><br>The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>The cost in total agrees to 2.8 Non-Routine Maintenance under following maintenance categories:<br>• Pole top, overhead line & service line maintenance<br>• Pole inspection and treatment<br>• Overhead asset inspection<br>• Network underground cable maintenance<br>• Distribution substation equipment & property maintenance<br>• Zone substation equipment maintenance | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | • Zone substation property maintenance<br>• Public lighting maintenance<br>• Scada & network control maintenance<br>• Protection systems maintenance. | |
| OVERHEADS | JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex).<br>Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | Opex costs are derived from extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category.<br><br>The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>The cost in total agrees to 2.10 Overheads under following overhead categories:<br>• Network overheads<br>• Corporate overheads. | n/a |
| AUGMENTATION | JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex).<br>Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | Capex costs are derived from extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category.<br><br>The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>The cost in total agrees to 2.3 Augex under following asset categories:<br>• Subtransmission substations, switching stations, | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | zone substations<br>• Subtransmission lines<br>• HV feeders<br>• Distribution substations<br>• LV feeders<br>• Other assets. | |
| CONNECTIONS | JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex).<br>Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | Capex costs are derived from extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category.<br><br>The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>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).<br>Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | Opex costs are derived from extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category.<br><br>The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>The cost in total agrees to 2.9 Emergency Response under major event days. | n/a |
| PUBLIC LIGHTING | JEN's cost collection process is noted above | Capex and Opex costs are derived from extracting | n/a |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex).<br>Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category.<br><br>The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>The cost in total agrees to 4.1 Public Lighting. | |
| METERING | JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex).<br>Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | Capex and Opex costs are derived from extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for this category.<br><br>The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>The cost in total agrees to 4.2 Metering. | n/a |
| FEE-BASED SERVICES<br>QUOTED BASED SERVICES | JEN's cost collection process is noted above under the variable Template 2.12 – Input Tables **EXPENDITURE** (Opex & Capex).<br>Information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | Capex and Opex costs are derived from extracting financial transactions from SAP that have various activities and general ledger codes that produce the cost stack for these categories.<br><br>The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>The costs in total agree to 4.3 Ancillary Services – | n/a |

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

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | information. | The methodology adopted for classifying the costs has been detailed above in the Global description section above.<br><br>The cost in total agrees to 2.6 Non-Network Expenditure under following expenditure categories:<br>• IT and communications<br>• Motor vehicles<br>• Buildings and property<br>• Other. | |

# 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.<br>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.<br>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 –**<br><br>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<br>&<br>Minor Road Light Installation | | | |
| **Light Installation – Volume of Works and Expenditure –**<br><br>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 –**<br><br>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 –**<br><br>Major Road Light Replacement<br>& | Light replacement work is recorded using SAP Notifications. The notification is created against the specific light that requires replacement.<br><br>The other source of data is the monthly reports from the public lighting prime contractor.<br><br>This allows the attributes of the public light such as whether it is located on a Major Road | 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.<br>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". | Jemena uses a prime contractor for public lighting services and as such, the public lighting replacement work is recorded using SAP notifications and the above mentioned Public Lighting Codes (MAT). It has been assumed that public lighting replacement work that is performed by resources other than the prime contractor have also been consistently recorded using SAP notifications. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Minor Road Light Replacement | 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".<br><br>RLN (Replace Single Light and Bracket Main Road) – All notifications with activity code RLN relate to "Major Road Light Replacement".<br><br>RLG (Replace With Sustainable Light) - All notifications with activity code RLG relate to "Minor Road Light Replacement".<br><br>RLO (Replace Single Light and Bracket Minor Road) – All notifications with activity code RLO relate to "Minor Road Light Replacement".<br><br>The public lighting notifications were extracted from SAP for 2016 and analysed. | |
| **Light Replacement Volume of Works and Expenditure –**<br><br>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.<br><br>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. | No assumptions have been made. |
| **Light Replacement Volume of** | This information is sourced from SAP.<br>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**<br><br>Total Cost | be used to identify public lighting replacement expenditure.<br>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.<br>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 2016 and analysed.<br>Direct Expenditure consists of;<br>• Direct Material expenditure<br>• Direct Labour expenditure<br>• Direct Contractors expenditure<br>• Direct Other expenditure<br>Costs do not include Direct Overheads and Corporate Overheads. | |
| **Light Maintenance Volume of Works and Expenditure –**<br><br>Major Road Light Maintenance<br>&<br>Minor Road Light Maintenance | Light maintenance works are recorded using SAP Notifications.<br>The other source of data is the monthly reports from the public lighting prime contractor.<br>The majority of the notifications are created by the 24x7 call centre which takes calls from the public regarding lights that require maintenance.<br>The other significant contributor to the volume of light maintenance is as a result of lights that are identified as requiring maintenance through the routine patrols and through the bulk relamping program. | 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.<br>The SAP Public Lighting Codes (MAT) were;<br>MLF (Main Road Public Lighting Fault) – All notifications with activity code MLF relate to “Major Road Light Maintenance”.<br>MLP (Public Light Maintenance – Major Road Patrol) - This activity involves the patrol all main roads on a defined cycle to identify public lighting faults.<br>MRB (Bulk Lamp Replacement – Minor Roads) – All bulk lamp replacements are considered a | Jemena uses a prime contractor for public lighting services and as such the public lighting maintenance work is recorded using SAP notifications and the above mentioned Public Lighting Codes (MAT). It has been assumed that public lighting maintenance work that is performed by resources other than the prime contractor have also been consistently recorded using SAP notifications. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | 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. | maintenance activity performed on Minor Roads.<br>MRF (Minor Road Public Lighting Fault) – All notifications with activity code MRF relate to "Minor Road Light Faults".<br><br>The public lighting notifications were extracted from SAP for 2016 and analysed. | |
| **Light Maintenance Volume of Works and Expenditure –**<br><br>Number of Poles Installed | Light maintenance works are recorded using SAP Notifications.<br><br>The other source of data is the monthly reports from the public lighting prime contractor.<br><br>The majority of the notifications are created by the 24x7 call centre which takes calls from the public regarding lights that require maintenance.<br><br>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.<br>The SAP Public Lighting Codes (MAT) were;<br>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.<br>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.<br><br>The public lighting notifications were extracted from SAP for 2016 and analysed. | Jemena uses a prime contractor for public lighting services and as such the public lighting maintenance work is recorded using SAP notifications and the above mentioned Public Lighting Codes (MAT). It has been assumed that public lighting maintenance work that is performed by resources other than the prime contractor have also been consistently recorded using SAP notifications.<br><br>It has been assumed that the words "NUMBER OF POLES INSTALLED" means "MAINTAINED" rather than "INSTALLED". |
| **Light Maintenance Volume of** | This information is sourced from SAP, the ERP system that JEN uses to capture its financial information. | By extracting the SAP costs related to specific SAP Public Lighting Activities we can determine the total direct expenditure of public light maintenance | No assumptions have been made. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| **Works and Expenditure**<br><br>Total Cost | 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. | activities.<br><br>The public lighting costs were extracted from SAP for 2016 and analysed.<br>Direct Expenditure consists of;<br>• Direct Material expenditure<br>• Direct Labour expenditure<br>• Direct Contractors expenditure<br>• Direct Other expenditure<br>Costs do not include Direct Overheads and Corporate Overheads. | |
| **Quality of Supply –**<br>Mean Days to Rectify or Replace Public Lighting Assets (days)<br>and<br>Volume of GSL Breaches<br><br>and | Light maintenance works are recorded using SAP Notifications.<br>The majority of the notifications are created by the 24x7 call centre which takes calls from the public regarding lights that require maintenance.<br>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 of days to rectify or replace the light to be analysed and reported. | The methodology is documented in Jemena Document No. **JEN PR 0500** - JEN AER Public Lighting Reporting Procedure.<br><br>By extracting the SAP notifications related to specific SAP Public Lighting Codes we can determine the required quality of supply variables.<br><br>Each SAP notification has the following information associated with it;<br>• Location of the light<br>• Attributes of the light<br>• Whether or not a GSL is applicable | No assumptions have been made in providing this information. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| GSL Payments | | • Defect start time and date<br>• Defect end time and date<br>• Duration of defect<br>The public lighting notifications were extracted from SAP for 2016 and analysed. | |
| **Quality of Supply –**<br>Volume of Customer Complaints | Customer complaints are managed by Customer Relations.<br>Customer Relations may receive complaints through the following means:<br>• Phone call to our Call Centre<br>• Email<br>• Phone call direct to Jemena<br>• Internal referral of an email or phone call<br>Customer Relations stores and maintains all customer complaints in the "Claims Database". | Customer complaints can be classified into two categories:<br>• 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.<br>• 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.<br>Both categories of complaints are considered legitimate complaints and are stored in the Claims Database with relevant detail. | No assumptions have been made in providing this information. 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 |
|---|---|---|---|
| **Major Road 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. |
| **Minor Road 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 |
|---|---|---|---|---|---|
| **Major Road Light Replacement**<br><br>**and**<br><br>**Minor Road** | Light Replacement works is recorded using SAP Notifications.<br><br>The expenditure associated with performing this work is | 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.<br><br>By extracting the SAP costs related to specific | Jemena is unable to calculate the unit rate for each light type within the major road or minor road category and therefore we have been required to make the assumption that | This is the best estimate because it uses the best available | JEN is currently undertaking a project (consistent with that which it proposed in its 2016-20 regulatory proposal) to identify and implement |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| **Light Replacement** | recorded against SAP projects.<br><br>Each SAP project is associated with an SAP Activity Code. | SAP Public Lighting Activities we can determine the total direct expenditure of light replacement activities.<br><br>The SAP Public Lighting Codes (MAT) were;<br><br>RLJ (Replace Single Light on Main Road)<br>RLN (Single Lantern and Bracket Replacement – Main Road)<br>RLM (Replace Single Light Minor Road)<br>RLO (Single Lantern and Bracket Replacement – Minor Road)<br>RLG (Sustainable Light Replacement)<br><br>Therefore the unit cost for a major and minor road light replacement has been calculated using the cost to replace the major and minor road lights (total cost less the pole replacement cost) divided by the total number of major and minor road lights that were replaced.<br><br>Jemena is unable to calculate a separate unit rate for major and minor roads or for each light type within each category. | the material cost for each type of light has minimal impact on the overall unit rate.<br>Therefore we have assumed that all light types in the same category are the same unit rate.<br>For example, replacements performed on lights on minor roads are set to the same cost per unit rate regardless of light type. | information.<br>JEN is unaware of a better estimation methodology. | actions necessary to report actual information in the future.<br>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 business process and enhance its systems to capture record and report the required information. |
| **Major Road Light** | Light Maintenance works is recorded using SAP Notifications. | By extracting the SAP notifications related to specific SAP Public Lighting Codes we can determine the quantity of light maintenance | Jemena is unable to calculate the unit rate for each light type within the | This is the best estimate because it uses the best | JEN is currently undertaking a project (consistent with that which it proposed in its |

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| **Maintenance**<br><br>**and**<br><br>**Minor Road Light Maintenance** | The expenditure associated with performing this work is recorded against SAP projects.<br><br>Each SAP project is associated with an SAP Activity Code. | activities and categorise them according to Major and Minor Roads.<br><br>By extracting the SAP costs related to specific SAP Public Lighting Activities we can determine the total direct expenditure of light maintenance activities.<br><br>The SAP Public Lighting Codes (MAT) were;<br>MLF (Main Road Public Lighting Fault)<br>MRB (Bulk Lamp Replacement – Minor Roads)<br>MLP (Public Light Maintenance – Patrol – Main Road)<br>MRF (Minor Road Public Lighting Fault)<br><br>Therefore the unit cost for a major and minor road light maintenance has been calculated using the cost to maintain the major and minor road lights (total cost less the pole maintenance cost) divided by the total number of major and minor road lights that were maintained.<br><br>Jemena is unable to calculate a separate unit rate for major and minor roads or for each light type within each category. | major road or minor road category 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.<br>For example, maintenance performed on lights on minor roads is set to the same cost per unit rate regardless of light type. | available information.<br>JEN is unaware of a better estimation methodology. | 2016-20 regulatory proposal) to identify and implement actions necessary to report actual information in the future.<br>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 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:<br>• SAP-ISU for Type 4 and Type 5 meters<br>• JSAP for Type 6 meters | Meter classification<br>• Type 4 = AMI (<160MWh)<br>• Type 5 = Non AMI interval<br>• 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 JSAP. | Purchase volumes are based on the number of new meters issued to contractors for installation (JSAP).<br>Meter issued for the purpose of installation is made up of: | None. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | • Meter purchased by the business (MAT 11002145 – single phase, MAT11002146 three phase)<br>Not included are:<br>• Meters purchased by AMI MRO program ( as this meters are already in RAB)<br>• Meters refurbished (as this meters are already in RAB)<br>Type 5 & 6 meters are no longer issued. | |
| Meter Purchase Costs | Meter Purchase costs are accurately tracked in JSAP as per Jemena procurement policy.<br>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 JSAP system.<br>The expenditure reflects the costs of new BAU meters issue for installation in 2016.<br>Meter purchased previously under AMRO program and any refurbished meters are not included as they have already been capitalised.<br>Type 5 & 6 meters are no longer issued. | None. |
| Meter Testing Costs | Meter testing costs are accurately tracked within JSAP via specific projects and PMO. | Total costs for meter testing is accurately tracked in JSAP (projects Y99-3 and Y99-11).<br>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).<br>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 |
|---|---|---|---|
| | | The costs ($20k) of customer paid re-tests have been re-assigned to “Other metering” variable of this schedule. | |
| Meter Testing<br>Volume | Accurately tracked in SAP-ISU via Service Order. | Meter test volumes were identified from specific SAP-ISU service order report.<br>This category includes:<br>• Mandatory sample testing of meters<br>• Mandatory meter maintenance (e.g. CT meters compliance tests)<br>• Meter accuracy tests (including customer requested re-tests that uncovered a genuine issue and therefore not paid by the customer) | None. |
| Meter Investigation<br>Volume | All investigation volumes are accurately tracked within JSAP and Jemena reporting systems.<br><br>Data presented is based on records stored in JSAP, SAP-ISU and UIQ systems. | The volume is obtained from service order reports (JSAP for type 6 & SAP ISU for Type 4 & Type 5 meter)<br>Service order type used for this activity is ZRMI<br>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 for 2016. | 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<br>Costs | The Meter Investigation costs are accurately tracked in JSAP via specific projects and PMO.<br>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 | Type 4 & 6 meter investigation costs are obtained from JSAP (Projects Y99-3, Y99-6, Y99-11) by reconciling contractor invoices (Select Solution and SkillTech) with JSAP to segregate meter investigation cost.<br>The costs also include internal labour to support | Meter investigations costs between type 5 and 6 metering were proportionally divided based on the volume of each type of meter installed in the network.<br>Proportional allocation gives an unbiased estimate of the split between type 5 and 6 investigations costs. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | costs at a micro level. | JEN AMI field investigations (JSAP projects Y99-6, Y99-3), which is obtained from time writing of specific FTE.<br><br>Type 6 meter investigation cost is calculated based on the volume of work done in JSAP multiplied by unit cost per investigation (SkillTech & Select invoices).<br><br>(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<br><br>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.<br><br>Contractor reports (from SkillTech) were used to confirm the volumes for 2016. JEN Customer Operations monitor reports and invoices. | All Type 4 meters are read remotely and are not included here. |
| Scheduled Meter Reading<br><br>Costs | The Scheduled Meter Reading costs accurately tracked within JSAP in specific projects and PMO and through invoices.<br><br>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. | Contractor (SkillTech) invoices were used to split the cost between basic and interval meter reads and reconciled back to SAP values (JSAP project JW6-3 & Y99-8). | All AMI meters are read remotely and therefore not reported under this meter reporting category. |
| Special Meter Reading | N/A<br><br>All special reads are performed as Fee -based | N/A | Recovery of data from failed meters is covered in<br><br>Sub-category Meter Maintenance. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Volume | Services and are covered in section 4.3. | | |
| Special Meter Reading Costs | N/A<br>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).<br>It includes all new meters installed as a result of new connection activities, excluding meters installed for temporarily building supply.<br><br>Only Type 4 meters are used for new installations. | None. |
| Meter Replacement Costs | The Meter Replacement costs are accurately tracked within JSAP via specific projects and PMO. | Meter Replacement costs are derived from JSAP (projects A10-3, A10-7).<br>Costs include legacy to AMI replacement and meter faults replacements, and comprise of:<br>• External contractor costs (Select Solution)<br>• Auxiliary materials costs<br><br>*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 | None. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | were incurred yet. | |
| 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).<br>Legacy to AMI meter volume is accurately tracked in SAP ISU service order report (ZMRO).<br>*For legacy meters:*<br>• ZRMO was used till May 2016 (until decommissioning of CIS+)<br>• from Jun 2016 to Dec 2016 all legacy to AMI exchange are tracked by Select Solution monthly report, which are then validated and linked to SAP ISU service order type ZRAA.<br>Only Type 4 meters are used in replacement activities. | 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 removed meters).<br>Maintenance activities are activities that follow meter removal, which include:<br>• meter refurbishment (by Secure)<br>• meter control (Select Solutions).<br>*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. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Meter Maintenance<br><br>Costs | The Maintenance costs are accurately tracked within Jemena SAP via specific projects and PMO. | Meter maintenance costs are obtained from JSAP.<br><br>All cost incurred under Secure meter service contract is captured under specific project & PMO, which is 100% maintenance cost.<br><br>Meter maintenance cost by Select Solutions is obtained by reconciling their invoice with JSAP to segregate meter maintenance cost.<br><br>Meter maintenance costs include:<br><br>a) Meter refurbishment<br>i) Cost of external contractor (Secure)<br>b) Meter control<br>i) Cost of external contractor (Select Solutions)<br><br>*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. | None. |
| Remote Meter Reading<br><br>Costs | Remote Meter Reading costs are accurately tracked within Jemena SAP system via specific projects and PMO. | The costs in this category is comprises of the efforts of JEN AMI NOC team that support meter read function.<br><br>Remote meter reading process uses an automated collection system, supported by AMI Network Operation Centre (**NOC**) team.<br><br>*Note:* the cost of AMI NOC team for 2016 is also captured as part of IT Infrastructure OPEX costs variable of this schedule. | This applies to Type 4 meters only. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Remote Meter Reading<br>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<br>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.<br>It excludes:<br>• complete population upgrade to the next software version<br>• customer initiated remote meter reconfiguration (e.g. solar upgrades)<br>Applies to Type 4 meters only. | None. |
| Remote Meter Reconfiguration<br>Costs | The cost is captured as part of Remote Meter Reading costs. | The cost is captured as part remote meter reading costs.<br>The costs in this category is comprises of the efforts of JEN AMI NOC team that support meter read function. | N/A. |
| IT Infrastructure<br>OPEX Costs | IT Infrastructure OPEX Costs are accurately captured in JSAP and reconciled back with management records.<br>An agreed methodology is then used to apportion costs of shared resources that could not have been directly assigned to ACS | 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.<br>The costs are tracked in JSAP and reconciled back | None. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | metering work.<br>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. | with management records.<br>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 infrastructure (AMI) IT and communications expenditure - 14 April 2016*) | |
| IT Infrastructure CAPEX Costs | IT Infrastructure CAPEX Costs are accurately tracked in JSAP.<br>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.<br>Note: RIN C Metering Capex includes Negative Costs in CY16 RIN for Metering IT, due to late re-adjustment of project costs from previous year. | None. |
| Communications Infrastructure CAPEX Costs | Communications Infrastructure CAPEX Costs are accurately tracked in JSAP.<br>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 JSAP 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. JSAP projects A10-006 for labour, VMM-006 for materials). | None. |
| Communications Infrastructure OPEX Costs | Communications Infrastructure OPEX costs are accurately tracked in JSAP, 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. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Other Metering Costs | All materially significant costs in this category are accurately tracked within Jemena SAP system, via JEN's Y99 Projects and PMOs.<br><br>Only small proportion of Other Metering costs (about 1.4% or $20k which is deemed immaterial) are estimated, because of contractor invoices (Select Solution) were not well itemised in 2016, nor did a separate JSAP activity exist to capture costs of one estimated activity performed by the contractor (i.e. processing of customer initiated remote re-configuration requests). | Other Metering costs are obtained directly from JSAP and include the following components:<br><br>• Meter compliance (Zinfra, only Type 4 Meter – new connections)<br>• Meter Operations costs (captured under Type 4 Meter, as most of the work is only done on Type 4 meters)<br>• Meter Data Management costs (JEN Type 4 meter, Aegis for Type 5&6, AusNet for type 7)<br>• Metering strategy & Planning (Type 4 meters)<br>• Regulatory oversight (recorded against Type 4 meter)<br>• Cost of the meter re-tests requested and paid by the customer | 23% of the New Connection team opex costs ($21k which is deemed immaterial) were used for processing of customer initiated meter reconfiguration requests. This estimate should not be required going forward as the contractor for processing of customer initiated remote re-configuration request has now changed (to Aegis), and the new contract will reflect the need for itemised costing.<br><br>Retest of type 4, 5 & 6 metering installations for first tier customers costing $19k is included in Other Metering costs. |

# 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 (JSAP and SAP ISU) and so this information is reported as 'actual information'. These services are:-<br>• De-energisation<br>• Re-energisation<br>• Special meter reading<br>• Re-test of type 4, 5 and 6 metering installations for first tier customers with annual consumption greater than 160MWh<br>• Fault response - not DNSP fault<br>• Temporary disconnect/reconnect services<br>• Wasted attendance - not DNSP fault<br>• Service truck visits<br>• Temporary supply services<br>• Remote meter re-configuration<br>• Remote De and re-energisation<br>• Routine Connections -customers <100 amps<br>• 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. |
| De- | Dollar data is captured in JSAP by projects and PMOs as | This cost is made up of contractor cost and captured | None. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Energisation cost | actual. | directly to specific projects in JSAP.<br>• Zinfra cost for this service is captured in FCJ and FCK – 100%<br>• SkillTech cost for this service is captured in JW6-3 – 30%<br>  • Percentage is derived from the contractor cost breakdown to perform De-Energise & Re-Energise for 2016 | |
| Re-energisation cost | Dollar data is captured in JSAP by projects and PMOs as actual. | This cost is made up of contractor cost and captured directly to specific projects in JSAP.<br>• Zinfra cost for this service is captured in FCL and FCM – 100%<br>• SkillTech cost for this service is captured in JW6-3 – 70%<br>  • Percentage is derived from the contractor cost breakdown to perform De-Energise & Re-Energise for 2016. | 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 JSAP by projects and PMOs as actual.<br><br>This cost is captured in ACS metering project (Y99) in RIN 4.2. | Total costs for meter testing is accurately tracked in JSAP (projects Y99-3 and Y99-11).<br><br>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).<br><br>Note: decision was taken not to continue the testing of legacy meters, as these are progressively replaced.<br><br>The costs ($20k) of customer paid re-tests are captured under Other metering – RIN 4.2. | |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Wasted attendance - not DNSP fault – Cost | Dollar data is captured in JSAP by projects and PMOs as actual. | This cost is captured in JSAP under MAT code NIW. | None. |
| Service truck visits – Cost | Dollar data is captured in JSAP by projects and PMOs as actual. | This cost is made up of business hour truck visits captured in MAT code NID. | None. |
| Temporary supply services – Cost | Dollar data is captured in JSAP by projects and PMOs as actual. | Costs, excluding Network and Corporate overheads, are obtained from JSAP projects CMZ 16 and CMZ 19 and by applying percentage methodology.<br><br>Percentage is calculated based on number of temporary supply jobs to the volume of overhead jobs completed in CY2016. | Overhead connections only. |
| Remote meter re-configuration – Cost | Dollar data is captured in JSAP by projects and PMOs as actual.<br><br>This cost is captured in ACS metering project (Y99) in RIN 4.2. | Total costs for remote meter reconfiguration is accurately tracked in JSAP (project Y99-3).<br><br>The costs ($21k) of remote meter reconfiguration is captured under Other metering – RIN 4.2. | |
| Routine Connections <100 amps – Cost | Dollar data is captured in JSAP by projects and PMOs as actual. | This cost, excluding Network and Corporate overheads are captured in JSAP under MAT codes CMU, CMZ, VM9, VMM, VMS, VMW and VMX for underground connections and CMZ for overhead connections (Excluding – Temporary supply services). | No temporary supply services exist in underground connection service. |
| AMI Metering Exit Fees - Cost | Expenditure is assumed to be equal to the meter removal component of JEN's AMI metering exit fees approved by the AER. | Expenditure shown reflects the meter removal cost components of JEN's AMI metering exit fees. Expenditure shown is the product of these fee amounts for each type of meter and the number of meters of each type for which | Expenditure is assumed to be equal to the meter removal opex component of the AMI metering exit fees approved by the AER for each type of meter. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | customers incurred an exit fee during CY2016.<br><br>JEN's expenditure in relation to each meter exit is equal to the meter removal opex component of the corresponding AMI metering exit fee. | |

### 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:<br>• Special meter reading<br>• Fault response - not DNSP fault<br>• Temporary disconnect/reconnect services<br>• Remote de-energisation<br>• Remote re-energisation<br>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 RIN A. 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.<br>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.<br>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 (CIS+ and SAP ISU) and this information is reported as 'actual information'. These services are:<br>• Supply abolishment > 100 amps<br>• After hours truck by appointment<br>• Routine Connections – customers >100 amps<br>• Temporary covering of low voltage mains and service lines<br>• Rearrangement of network assets at customer request<br>• Elective Undergrounding<br>• 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 JSAP by projects and PMOs as actual. | This costs, excluding network and corporate overheads are captured in JSAP under CME and CMV MAT code project.<br>Cost is made up of:<br>• Field labour cost (Select Solutions contractor cost)<br>• Back office cost (Aegis) | None. |
| Cost – Reserve feeder per KW | Underlying dollar data used to assess reserve feeder cost is captured in JSAP projects. | As per AER approved methodology. | None. |
| Cost – Elective | Dollar data is captured in JSAP by projects and PMOs as actual. | This costs, excluding network and corporate overheads | None. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Undergrounding | | are captured in JSAP under CME MAT code project.<br>Cost is made up of:<br>• Field labour cost (Zinfra contractor cost)<br>• Back office cost (Aegis)<br>Note: Actual cost is captured in CDA MAT code project and moved to CME MAT code project based on unit cost rate and volume. | |
| Cost – Temporary covering of low voltage mains and service lines | Dollar data is captured in JSAP 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 JSAP 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 JSAP 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 JSAP 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 support in this category, instead of the age profile of the pole with pole support.<br>In 2015, we reported the age profile of the pole we staked. In 2016, we are reporting the age profile of the stake (pole support) itself, following an enquiry from the AER in March 2017. With this change of methodology, the increment shows that from 2015 to 2016, JEN staked about 600 poles. JEN staked about 300 poles in 2016, the remaining approximately 300 came from data correction due to the new methodology.<br>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.<br>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.<br>Dates for asset installations 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 – >1kV & <=11kV, >11kV & <=22kV, Wood, Concrete, Steel | JEN's internal GIS system is the single source of the network asset data.<br>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.<br>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. |
| Poles: >22kV & <=66kV; Wood, Concrete, Steel | JEN's internal GIS system is the single source of the network asset data.<br>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.<br>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.<br>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.<br>Dates for asset installation were not known for all | No assumptions were made. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | 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 - > 1 kV & < = 11 kV, >11 kV & < = 22 kV ; Single-Phase, > 11 kV & < = 22 kV ; Multiple-Phase | JEN's internal GIS system is the single source of the network asset data.<br>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.<br>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 - > 22 kV & < = 66 kV | JEN's internal GIS system is the single source of the network asset data.<br>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.<br>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. | The UG Cable data for LV is extracted from the GIS (which includes assets owned by other parties) | No assumptions were made. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology. | using a data interrogation tool. Once extracted the data is filtered to provide only in-service cable that belong to JEN.<br>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. | |
| Underground Cables<br>- >1kV & <=11kV,<br>>11kV & <=22kV, | JEN's internal GIS system is the single source of the network asset data.<br>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.<br>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.<br>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.<br>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 |
|---|---|---|---|
| | | | |
| Service Lines – Residential and Commercial and Industrial (Simple Type) | JEN's internal GIS system is the single source of the network asset data.<br>JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology. | The OH Service Line 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 service lines that belong to JEN.<br>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.<br>The connectivity in the GIS between the service line and the supply point was used. The attributes of the connected supply point were used to determine whether the service line was connected to a residential, commercial or industrial property. | For service type that is not classified as residential or commercial/industrial such as farm, public light, N/A, other are assumed to be classified as part of residential. |
| Service Lines<br>< 11 kV (Complex Type) and Service Lines >11 kV | JEN's internal GIS system is the single source of the network asset data.<br>JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology. | The OH Service Line 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 services that belong to JEN.<br>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.<br>The connectivity in the GIS between the service line and the supply point was used to determine whether the service line was connected to a residential, | For service types that are not classified as residential or commercial/industrial such as farm, public light, N/A, other, are all assumed to be classified as residential. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | commercial or industrial property. | |
| Transformers – Pole Mounted, Kiosk Mounted, Ground Outdoor / Indoor Chamber Mounted (excluding zone substation transformers) | JEN's internal GIS system is the single source of the network asset data.<br>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.<br>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. |
| Transformers – Ground outdoor / Indoor chamber mounted :<br>>33kV & <=66kV;<br><=15 MVA; and<br><=40 MVA<br>(Zone Substation) | JEN's internal GIS system is the single source of the network asset data.<br>JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology.<br>. | 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.<br>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.<br>JEN considers this data to be actual as they | 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 | No assumptions were made. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | are derived based on ELE PR 011 Asset Age Profiling Methodology. | belongs to JEN.<br><br>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. | |
| < = 11 kV ; Switch,<br><br>> 11 kV & < = 22 kV ; Switch<br>< = 11 kV ; Circuit Breaker<br><br>> 11 kV & < = 22 kV ; Circuit Breaker | JEN's internal GIS system is the single source of the network asset data.<br>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.<br><br>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.<br>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.<br><br>Dates for asset installation were not known for all assets. Actual installed dates were combined with calculated and derived dates to produce age | No assumptions were made. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | profiles based on the methodology outlined in ELE PR 0011 Asset Age Profiling Methodology. | |
| > 33 kV & < = 66 kV ; Circuit Breaker | JEN's internal GIS system is the single source of the network asset data.<br>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.<br><br>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 – Lamps | JEN's internal GIS system is the single source of the network asset data.<br>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.<br><br>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 - | JEN's internal GIS system is the single source | The public lighting pole equipment is extracted from | No assumptions were made. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Poles | of the network asset data.<br>JEN considers this data to be actual as they are derived based on ELE PR 011 Asset Age Profiling Methodology. | 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.<br>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.<br>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.<br>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.<br>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.<br>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 | No assumptions were made. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| | | PR 0011 Asset Age Profiling Methodology. | |
| 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. | | |
| Mean and Standard Deviation | SAP is the source of data to calculate mean and standard deviation for all the asset categories.<br>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:<br>• Date of installation<br>• Date of retirement<br>• 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<br><br>Date MD occurred<br><br>Half hour time period MD occurred<br><br>Winter/Summer peaking | Source:<br>- \\vtalpwfile07\netmgt\network planning\terminal station forecasts\2016 AEMO Forecasts\IMS data\JEN TOTAL MW and MVAr (2016).xls<br><br>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.<br><br>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:<br>Summer 2015/16 = 01/10/2015 to 31/03/2016<br>Winter 2016 = 01/04/2016 to 30/09/2016<br><br>As winter 2016 data is not yet available, 2016 raw coincident MD is assumed to occur in summer as JEN is a summer peaking network.<br><br>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:<br>- \\vtalpwfile07\netmgt\network planning\terminal station forecasts\2016 AEMO Forecasts\Co-gen\JEN TOTAL GENERATION MW (2016).xls<br><br>The data contained within the above files is 15 minute MW embedded generation meter | Only embedded generators above 1MW capacity are included, as follows:<br>– Bioscience Research Centre<br>– EDL – Bolinda Landfill<br>– EDL – Brooklyn Landfill<br>– Preston Mini Hydro<br>– Visy<br>The total MW value corresponding to the date and | LaTrobe University cogen is not included at subtransmission level as it is connected via the AusNet Services network.<br><br>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. | time of maximum MW demand (as above) is copied directly to the category analysis RIN template. | |
| Weather corrected (10% PoE) network coincident MD<br><br>Weather corrected (50% PoE) network coincident MD | Source:<br>- \\vtalpwfile07\netmgt\network planning\AER\3 - Category Analysis (RIN C)\2017 RIN C (2016 data)\Template 5.3 & 5.4\2016 Maximum Demand Forecast analysis.xls<br><br>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.<br><br>Adjusted MW MD is calculated as follows:<br>$$MD_b = MD_a \times \frac{-1.524{t_b}^2 + 108.5t_b - 925.2}{-1.524{t_a}^2 + 108.5t_a - 925.2}$$<br>Where:<br>$MD_b$ = MW MD after temperature adjustment<br>$MD_a$ = actual unadjusted MW MD<br>$t_b$ = average daily temperature to adjust to (32.9°C for 10% POE or 29.4°C for 50% POE)<br>$t_a$ = average daily temperature on day of actual unadjusted MW MD<br><br>Average daily temperature is calculated as follows:<br>$$t = \frac{(t_{max} - t_{min})}{2}$$<br>Where:<br>$t$ = average daily temperature<br>$t_{max}$ = maximum temperature of the day (24 hour period) (data sourced from PI)<br>$t_{min}$ = 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 substransmission substations or terminal stations. | Not applicable. | Not applicable. |
| Subtransmission Substation – Raw Adjusted MD<br><br>Subtransmission Substation – Date MD Occurred<br><br>Subtransmission Substation – Time MD Occurred<br><br>Subtransmission | Source:<br><u>Summer</u><br>- Non-coincident data: \\vtalpwfile07\netmgt\network planning\feeder forecasts & MDs\2016 Forecasts\Model\Model (Jan 2017) - error corrected\1forecast inputs & constants.xlsm<br>- Coincident data: \\vtalpwfile07\netmgt\network planning\feeder forecasts & MDs\2016 Forecasts\ Model\Model (Jan 2017) - error corrected \9Historical System Coincident | <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 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.<br><br><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 | 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.<br><br>MVA MD is assumed to occur at the time of MW MD.<br><br>Category analysis RIN column headings are interpreted as follows to align with readily available data recorded in the normal course of business:<br>Summer 2015/16 = 01/10/2015 to 31/03/2016<br>Winter 2016 = 01/04/2016 to 30/09/2016<br><br>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 2016. All new stations and stations with significant permanent |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Substation – Winter/Summer Peaking | Demand.xlsm<br>Winter<br>- Non-coincident data: \\vtalpwfile07\netmgt\network planning\ terminal station forecasts\2017 AEMO Forecasts\Itron<br><br>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. | category analysis RIN template.<br><br>The date/time provided is the end time of the 15 minute interval (AEST).<br>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:<br>• 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.<br>• 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. | transfers were checked for winter MDs.<br><br>"Coincident" is assumed to be at the time of JEN network coincident MD, as per template 5.3. |
| Subtransmission Substation – Adjustments – Embedded Generation | Source:<br>- \\vtalpwfile07\netmgt\network planning\terminal station forecasts\2016 AEMO Forecasts\Co-gen\JEN TOTAL GENERATION MW (2016).xls<br>The data contained within the above files is 15 minute MW embedded generation meter readings sourced from the Interval | Only embedded generators above 1MW capacity are included, as follows:<br>– Bioscience Research Centre<br>– EDL – Bolinda Landfill<br>– EDL – Brooklyn Landfill<br>– Preston Mini Hydro<br>– Somerton Power Station*<br>– Visy<br>The MW value corresponding to the date and time of maximum MW demand (as above) is copied directly to the | 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 |
|---|---|---|---|
| | Meter Store and Itron. Therefore the data provided is actual data. | category analysis RIN template for each terminal station / bus group.<br><br>*SMTS MD does not include Somerton Power Station. | |
| Zone Substation – Substation Rating | Source:<br>- \\vtalpwfile07\netmgt\network planning\Distribution Annual Planning Report\2016 DAPR\Report\For publication\2016 Distribution Annual Planning Report_V1.1.pdf<br>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.<br><br>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).<br><br>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:<br>– KLO<br>– MAT<br>– MB<br>– SA<br>– TT<br>– VCO<br>– WT | For each year the rating provided is for the season in which the MD occurs. |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Zone Substation – Zone Substation – Raw Adjusted MD<br><br>Zone Substation – Date MD Occurred<br><br>Zone Substation – Time MD Occurred<br><br>Zone Substation – Winter/Summer Peaking | Source:<br><u>Summer</u><br>- Non-coincident data: \\vtalpwfile07\netmgt\network planning\feeder forecasts & MDs\2016 Forecasts\Model\Model (Jan 2017) - error corrected\1forecast inputs & constants.xlsm<br>- Coincident data: \\vtalpwfile07\netmgt\network planning\feeder forecasts & MDs\2016 Forecasts\ Model\Model (Jan 2017) - error corrected \9Historical System Coincident Demand.xlsm<br><u>Winter</u><br>- Non-coincident data: \\vtalpwfile07\netmgt\network planning\AER\3 - Category Analysis (RIN C)\2017 RIN C (2016 data)\Template 5.3 & 5.4\5.4 MD & Utilisation-Spatial - including formulas.xlsx<br><br>The data contained within the above source files is extracted from PI and IMS/ Itron. This is | <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 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.<br><br><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.<br><br>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).<br><br>Zone substation demand is at the transformer and therefore includes the impact of any capacitor banks at the terminal station.<br>Note: MD data contained within the data source file has been adjusted to system normal conditions by accounting for | MVA MD is assumed to occur at the time of MW MD.<br><br>As JEN load at SA is supplied from shared feeders, there is no metered actual data available for JEN load. Therefore, SA MD is estimated. Please refer to 'Estimated Information' section below.<br><br>Category analysis RIN column headings are interpreted as follows to align with readily available data recorded in the normal course of business:<br>Summer 2015/16 = 01/10/2015 to 31/03/2016<br>Winter 2016 = 01/04/2016 to 30/09/2016<br><br>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 2016. All new stations and stations with significant permanent transfers were checked for winter MDs.<br><br>"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 |
|---|---|---|---|
| | actual metered MD data. | 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:<br>• 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.<br>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:<br>- \\vtalpwfile07\netmgt\network planning\terminal station forecasts\2016 AEMO Forecasts\Co-gen (use generator files relevant to each zone substation)<br>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:<br>– Bioscience Research Centre (ZSS: NH)<br>– EDL – Bolinda Landfill (ZSS: BD)<br>– EDL – Brooklyn Landfill (ZSS: TH)<br>– LaTrobe University (ZSS: TT)<br>– Preston Mini Hydro (ZSS: CN)<br>– Visy (ZSS: VCO)<br>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 | This data is a calculated actual, | The 10% POE and 50% POE average daily temperatures and | It is assumed that the 10% POE and 50% POE average daily |

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Substation – Weather Corrected MD<br><br>Zone Substation – Weather Corrected MD | based on the actual metered maximum demand and temperature, using Jemena's established method for temperature adjustment.<br><br>Source:<br>- \\vtalpwfile07\netmgt\network planning\AER\3 - Category Analysis (RIN C)\2017 RIN C (2016 data)\Template 5.3 & 5.4\Temperature adjustment for actuals.xlsm<br><br>Source of coefficients A, B and C used for calculations in above file:<br>- \\vtalpwfile07\netmgt\network planning\feeder forecasts & MDs\2016 Forecasts\Model\Model (Jan 2017) - error corrected\1forecast inputs & constants.xlsm | MD temperature sensitivity relationship is based upon observed historical data.<br><br>Adjusted MW MD is calculated as follows:<br>$$MD_b = MD_a \times \frac{-1.524{t_b}^2 + 108.5t_b - 925.2}{-1.524{t_a}^2 + 108.5t_a - 925.2}$$<br>Where:<br>$MD_b$ = MW MD after temperature adjustment<br>$MD_a$ = actual unadjusted MW MD<br>$t_b$ = average daily temperature to adjust to (32.9°C for 10% POE or 29.4°C for 50% POE)<br>$t_a$ = average daily temperature on day of actual unadjusted MW MD<br><br>Average daily temperature is calculated as follows:<br>$$t = \frac{(t_{max} - t_{min})}{2}$$<br>Where:<br>$t$ = average daily temperature<br>$t_{max}$ = maximum temperature of the day (24 hour period) (data sourced from PI)<br>$t_{min}$ = minimum temperature of the day (24 hour period) (data sourced from PI) | temperatures and MD temperature sensitivity relationship is consistent over the period 2009-2016.<br><br>Weather corrected MD is assumed to have the same MW/MVA ratio as raw adjusted MD. |

## Estimated information

| Variable | Why estimate, not actual | Basis for estimate | Assumptions | Why best estimate | Actions to report actual data in future |
|---|---|---|---|---|---|
| **SA zone substation:**<br><br>Zone Substation – Raw Adjusted MD – Coincident & Non-coincident<br><br>Zone Substation – Date MD Occurred – Non-coincident<br><br>Zone Substation – Time MD Occurred – Non-coincident<br><br>Zone Substation – Winter/Summer Peaking – Non-coincident<br><br>Zone Substation – Weather Corrected 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 available. The MD at SA is estimated by a combination of:<br>1. Using ACR data provided by Powercor, where available,<br>2. multiplying the full feeder load by an assumed proportion of JEN load for each feeder where ACR data is not available,<br>3. applying knowledge of customer growth/new customer loads obtained from customer applications, and<br>4. trending from previous year's MDs.<br>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. | It is assumed that JEN load at SA is the following proportion of the SA feeders supplying JEN load:<br>– SA02: 10%<br>– SA06: 25%<br>– SA12: 30% | Combines all available knowledge of JEN load supplied by SA zone substation.<br>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. |

# 6.3 SUSTAINED INTERRUPTIONS

## 6.3.1 SUSTAINED INTERRUPTIONS TO SUPPLY

### Actual information

| Variable | Source and why actual | Methodology | Assumptions |
|---|---|---|---|
| Sustained interruptions to supply (2016) | Jemena's Outage Management System (**OMS**) is the repository for all outage information since 18 June 2010.<br>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.<br>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.<br>For vegetation related outages, the "Detailed reason for interruption" for each event has been verified against JEN's Electric Line Clearance Performance Report 2016 produced for the ESV and Councils.<br>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.<br><br>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.<br><br>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. | |

# Appendix A
# Balancing item reconciliation

Jemena

# A1. 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 | (1,170,749) |
| Public Lighting - Duplication of Capitalised Network & Corporate Overheads costs as it appears in both the Repex and the Public lighting templates | (318,490) |
| Connections - Duplication of direct costs as it appears in both the Connections and Fee & Quoted templates | (5,548,576) |
| Connections - Duplication of Capitalised Network & Corporate Overheads as it appears in both the Connections and Fee Based & Quoted templates | (1,219,759) |
| Non-network - Duplication of Capitalised Network & Corporate Overheads as they appears in both Non-network & Overhead templates | (5,298) |
| Alternate control services share of Non Network (Motor Vehicle) included in RIN C Non-Network category | (17,545) |
| ACS Metering - Non-network recorded in RIN A ACS Metering and RIN C Non-Network | (99,089) |
| TOTAL | (8,379,505) |
| **TABLE 2.1.2 - STANDARD CONTROL SERVICES OPEX** | |
| Non-Network IT cost duplication that appears in Non Network Opex and Corporate Overheads (SCS) | (11,082,254) |
| 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 | (605,870) |
| 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 | (138,769) |
| The impact of the difference in definitions of Network overheads in RIN A vs RIN C | 275,379 |
| Maintenance number duplicated when categorising 'by location' | (44,572) |
| Other | (7,942) |
| TOTAL | (11,604,026) |

| 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 | (5,548,576) |
| Duplication of ACS Connection Capitalised Network & Corporate Overheads costs as it appears twice in ACS Capitalised Network & Corporate Overheads | (1,219,759) |
| ACS Amounts not reported in RIN A (including overheads) - Connections & Ancillary Network Services (Note: RIN A 8.2.3 only included Metering & Public Lighting) | (6,860,423) |
| ACS Metering - Non-network recorded in RIN A ACS Metering and RIN C Non-Network | 99,089 |
| TOTAL | (13,529,668) |
| **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 | 138,769 |
| 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 | 605,870 |
| The impact of the difference in definitions of Network overheads in RIN A vs RIN C | (275,379) |
| Other | 7,942 |
| TOTAL | 477,201 |